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Precast concrete provides a safer means of building

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

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.

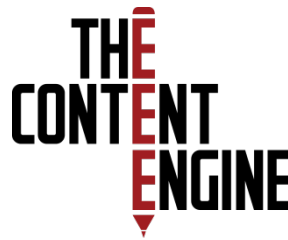
The modular precast concrete system comprises beams and columns, as well as slabs, including hollow-core and rib-and-block systems. They are manufactured in a factory and then transported on a just-in-time basis to site where they are installed.

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 accuracies and quality that have been achieved on many HCC projects, while also contributing towards their buildability,” Willie de Jager, managing director (MD) of Corestruc, says.

The MD points out that there are different techniques 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



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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.

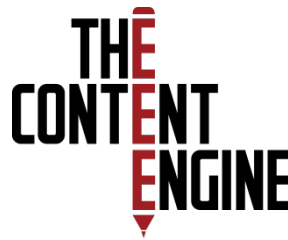
Conventionally, three separate teams are required in *in-situ* construction. Following on the earthworks, workers place and fix the steel reinforcement for the foundations and another team then establishes the formwork. These teams, comprising mainly moderately skilled people, may be required to work 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 is able to 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 our 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,” De Jager says.

“Our teams work alongside those tasked with the *in-situ* component of the project,” De Jager says. 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.”



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Noticeably, is the role that precast concrete plays in providing a cleaner site, minimising the need for heavy construction material delivery vehicles. This also contributes towards safer construction sites.

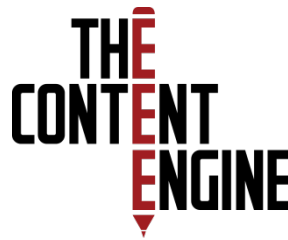
It has taken time for HCC projects to gain traction in South Africa, compared to countries in the developed world. This is considering the focus on labour-based construction in the country. The extremely labour-intensive nature of the manufacturing component of the precast concrete value chain is often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

In addition to providing a safer working environment for many people, De Jager highlights that 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.

“Conversely, temporary workers on conventional *in-situ* construction projects seldom become permanent employees even when they do have an aptitude for construction. In many instances, unskilled members of a community are appointed to undertake less-onerous aspects of the contract and are only recognised as semi-skilled or skilled labour once the project is completed. They are, therefore, extremely reliant on a consistent and regular pipeline of projects from the public sector for future employment,” he says.

The extent of the level of skills required in the manufacture of precast elements is largely dependent upon the nature of the precast concrete elements that are being designed and manufactured.

They augment the skills and capabilities of the large teams that are already tasked with the various components of the *in-situ* works programme of an HCC project. In many instances, precast concrete systems have successfully supplemented limited skilled labour that is available for a project. A dearth of specialist skills and trades remains a major challenge for many contractors, negatively impacting productivity and safety on sites, while compromising the smooth implementation of important infrastructure-delivery programmes.



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Corestruc's ability to mitigate risks, including safety, on construction sites have played a key role in helping client bodies, especially municipalities, roll-out important infrastructure.

Its competencies complement labour-based construction policies, such as the Expanded Public Works Programme, and the specialist continues to also work closely with smaller emerging contractors and unskilled labour on municipal projects. These include reservoirs and sports complex projects.

Corestruc continues to prove that it is committed to employment and skills development in the larger construction industry, while its ongoing investment into innovation in precast concrete technologies will assist clients in safely accelerating infrastructure programmes.

[Image Rob_4528]:

[Caption] : The installation teams include a crane operator and rigger.