a 48 Andries Bruyn Street
Horison, Roodepoort
Gauteng 1724

t +27 11 760 1020
e debbie@thecontentengine.co.za
w www.thecontentengine.co.za

CoreSlab drives uptake of precast concrete and HCC technologies

CoreSlab's involvement in a number of public sector projects reflects the ongoing growth of precast and hybrid-concrete construction (HCC) technologies in the country.

This leading precast concrete designer and manufacturer has participated in many successful infrastructure-related projects, ranging from reservoirs through to the expansion of student accommodation at universities.

However, Jaco de Bruin, managing director of CoreSlab, believes that there is still immense scope to grow this modular method of construction in the country.

"Our projects have proved that precast concrete technologies and HCC provide a faster and safer manner of constructing essential infrastructure, in addition to contributing towards a very high quality final structure. Considering the enormous backlog in infrastructure delivery programmes, there is a much larger role for these technologies to play in the future," De Bruin says.

He believes that much of the success achieved by CoreSlab since its inception in 2008 can be attributed to the approach it takes to projects.

Importantly, CoreSlab prefers to become involved in a project as early as possible and, in so doing, also assuming an advisory role in the optimal use of precast concrete technologies and HCC in the early design phases.

A sound example of this method is the company's more recent involvement in the expansion of male and female residences at the University of Venda.

CoreSlab is supplying just under 10 000 tons of precast concrete elements, covering a surface area of about 34 000 m², to this development, with up to 400 m² of hollow-core slabs – three truckloads of items – installed in a single shift.

De Bruin and his team worked closely with Lemeg Architects, and structural engineer, Thiko Consulting, to optimise the use of hollow-core slabs ahead of the construction phases.

The company also designed a precast foundation system that saved time in the construction phases, as well as a number of post-fixed items that have further streamlined the project and reduced the cost of the build for the client.

"We continue to work closely with the engineering teams on infrastructure-related programmes and structural experts involved in building projects. Importantly, this has helped overcome the dearth of available specifications, especially in terms of HCC designs in South

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Africa. Certainly, the lack of precast design criteria and assistance is arguably one of the biggest hindrances to greater uptake of the technology in the country," he says.

A similar approach is adopted when working with the main contractors that are tasked with the *in-situ* component of the works programme.

Importantly, this extensive upfront planning minimises late changes to the design or work scope, considering that HCC is less flexible than conventional concrete construction methods.

In addition, meticulous attention is paid to the interface between the precast concrete installation teams and the activities of the main contractor and various sub-contractors.

The company has worked closely with a number of prominent civil-engineering contractors on various complex infrastructure projects that involved a combination of precast concrete technologies and conventional *in-situ* techniques.

This includes on the 50 Ml Mafenya Reservoir, which received a commendation at this year's prestigious Fulton Awards for excellence in the design and use of concrete.

As a specialist sub-contractor to the main contractor, Murray & Dickson Construction, CoreSlab designed and installed the pre-cast roof structure to help significantly accelerate the works.

The entire system comprised 36 columns, 40 beams and 290 slabs, as well as a pre-cast coping system to finish the roof-edge.

Installation was undertaken by Corestruc, a sister company that helps CoreSlab project manage and assist in the installation of the precast components.

De Bruin says that tasking an expert in the field with this component of the entire value-chain has also contributed towards CoreSlab's growth in the market.

In terms of precast concrete and HCC technologies, correct and accurate levels, as well as precision tolerances feature high on the agenda of the entire professional team. Both consulting engineer and contractor also want to be assured of the stability of the system during installation.

Nothing is left to chance and a state-of-the-art theodolite is used to ensure utmost accuracy during surveying.

Other important considerations in these early phases of the project lifecycle include determining the construction sequence, transportation of the items, as well as crane capacity and access.

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“Preparatory work also extends to the production processes to ensure timely dispatch of the items. The factory is the heart of the operation, and sound forecasting here ensures efficiencies and quick turnaround times. In many instances, we have had to plan around the delivery of these items in extremely remote locations on a just-in-time basis. This aspect of the operation is undertaken by specialist group companies, Corehire and Corefleet,” he says.

Certainly, CoreSlab also gives as much weight to the finalisation of the connection system during these early phases.

De Bruin says that key considerations for all members of the professional team include tensile capacity, ductility, durability and movements, among others.

He believes that the onus also lies on precast specialists to help educate the industry on this critical component of precast concrete and HCC.

In many instances, the company has designed and manufactured its own unique solution that strikes a better balance between site conditions and costs, and this is undertaken in close collaboration with the structural and civil-engineering teams.

Certainly, the high quality of each concrete element has also been a key driver of CoreSlab’s success, allaying any fears around colour consistency and correct standards and quality.

Representatives of the CORE group of companies are members of leading South African industry associations, including the Concrete Manufacturers Association and the Concrete Society of Southern Africa.

Both organisations continue to play a prominent role in transferring knowledge on the many benefits of building with precast concrete. Their efforts include hosting technical conferences and seminars that serve as a platform for knowledge transfer and sharing best practice in the industry.

Importantly, De Bruin says members’ projects can be referenced and used as case studies to help grow precast concrete and HCC technologies in South Africa.

Meanwhile, CoreSlab is also playing its part in introducing young built-environment professionals to the industry.

Four students from the University of Venda recently worked on one of the company’s flagship projects where they were afforded the opportunity to supplement their studies with important practical training. On this project, the company worked closely with VBL Consulting Engineers as the structural engineer and Paragon Architects.

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"Early stage of learning at both university and college level is critical to the growth of our industry. The six-storey 2Ten Hotel project was built entirely from a bespoke precast concrete system, and remains one of the many highlights of the company's long track record in the precast concrete sector. There were many complexities, providing a fertile training ground for these young aspiring built-environment professionals. I am sure that many of them will go onto being 'champions' of this form of construction in the foreseeable future," De Bruin concludes.

Image & Caption:

[Image] Rob_2825:

[Caption]: Pre-cast concrete and HCC have a large role to play in infrastructure roll-out programmes

For more information please contact :

Debbie Poggiolini

debbie@thecontentengine.co.za

David Poggiolini

david@thecontentengine.co.za