

PRECAST concrete for a MODERN HOTEL

To meet demand, management of EMM Convention Centre are expanding the existing sophisticated infrastructure by as much as 61 rooms by building a new hotel on site in Sibasa, Limpopo.

The new 2Ten Hotel being built next to the convention centre in the heart of Sibasa, five kilometres outside Thohoyandou in Limpopo, will more than double the current hotel room capacity. It will also feature the same high quality facilities its patrons have come to enjoy over the years.

By June 2018, owner of the facility, George Magwabeni, intends opening the new hotel to his clientele, which includes representatives of state and business people, as well as students and personnel of the University of Venda.

Planning

Right from the early planning stages of the second phase expansion, Magwabeni and his management team decided that they wanted a modern structure that would continue to add value for the next 30 years.

Paragon Architects have therefore designed a robust and durable building that relies extensively on a precast concrete solution from Corestruc.

"I was introduced to Corestruc and its systems by Paul Botha,

our structural engineer. Representing VBL Consulting Engineers, he has nurtured a long working relationship with the precast concrete specialist. I was very impressed with what the company had to bring to the project," the property developer and successful entrepreneur tells *Construction World*.

Certainly, one of the other benefits this system offered the professional team was a quicker and safer build considering that all of the precast elements are manufactured in tightly controlled conditions and then transported to site where they are installed.

Benefits

By undertaking construction in this manner, Magwabeni's team has also overcome one of the most challenging aspects of the project, namely extremely constrained on-site conditions.

A precast solution has reduced the number of workers on site, while eliminating complex co-ordination of ready-mix deliveries, as well as the erection and dismantling of formwork and scaffolding.

There is just enough space for a tower crane to lift and help install the various precast elements placed in a very limited laydown area, which receives about nine wall panels and six slabs a day to complete the rest of the structure now that the columns, beams and floor slabs are in place. Horse-and-trailer trucks had to be separated after offloading of the pre-cast concrete elements to allow Corestruc to turn the trailers around the tower crane so that the truck could exit the site.

One of the most complex aspects of the project is the installation of and the coping and 840 m² of precast concrete wall panels around the perimeter of the structure.

Accuracy

The accuracy and tolerances of between two millimetres and three millimetres on the features and dimensions of the wall panels and coping is testament to Corestruc's manufacturing and installation processes.

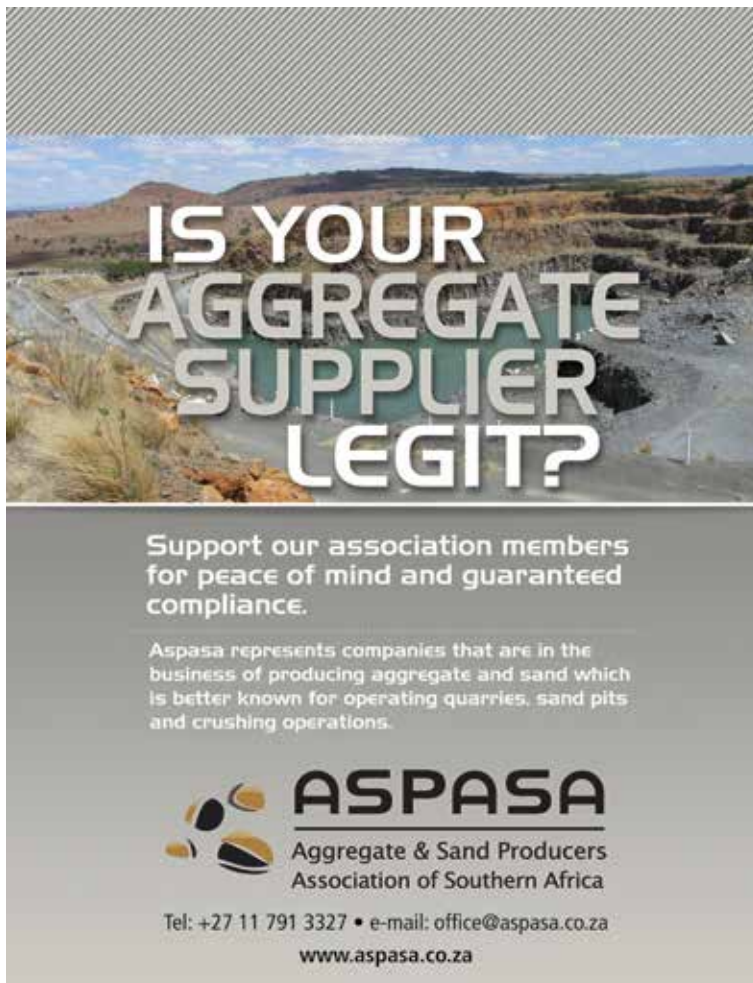
As the company's Russell Hobbs points out, achieving this level of accuracy deploying conventional in situ construction techniques would be near to the impossible without prolonging the building period.

The use of self-compacting concrete (SCC) to manufacture all of the panels, as well as coping allows for a very high-quality finish, ensuring an aesthetically appealing façade. Importantly, this SCC, which has been designed by Corestruc's own concrete technologists, also adds to the overall durability requirements of the final build, with each of these items between 80 Mpa and 94 Mpa.

This fluid concrete that does not segregate is poured into specialised forms that Corestruc imported from Australia especially for this project. This technology has streamlined and accelerated manufacturing, as well as logistics of supply to site.

As is the case on all of Corestruc's projects, accuracy in the precast yard and on-site have also been bolstered by sound up-front planning. This includes the design of a template right around the structure to guide the manufacture and installation of the extensive coping and wall panels required for the build.

They are installed using a small team of five people, including the tower crane operator, starting with the bolting and grouting of the coping into the hollow-core floor slabs. They, in turn, support the large panels upon



IS YOUR AGGREGATE SUPPLIER LEGIT?

Support our association members for peace of mind and guaranteed compliance.

Aspasa represents companies that are in the business of producing aggregate and sand which is better known for operating quarries, sand pits and crushing operations.

ASPASA
Aggregate & Sand Producers Association of Southern Africa

Tel: +27 11 791 3327 • e-mail: office@aspasa.co.za
www.aspasa.co.za



the use of floor space, while allowing the architects to achieve an impressive slenderness ratio. They are connected to the perfectly aligned columns that were installed according to a template that was placed on top of the foundations in the very early stages of installation.

which the smaller precast concrete items rest. This allows for a repetitive process, with accelerated production rates on site also aided by the choice of an international fixing system early on in the final design stages of the project to facilitate quicker installation of the various precast elements.

Most of the precast concrete items are bespoke items and designed especially for this project, including the 'fanning' to close openings between slabs due to the sloped terrain of the building site.

However, it is the continuous precast concrete columns towering over the site that best reflect Corestruc's design, manufacturing and installation capabilities.

Extending all the way from ground level to the roof of the hotel, they vary between 60 MPa and 70 Mpa. One of these columns carries about 400 tons, including structural steel, as well as the pre-cast concrete floor slabs and beams. The latter span between 5,5 metres and eight metres between the centre columns, optimising

A total station was used to align them to achieve the dimensional accuracy, with the installation teams achieving tolerances of between three and five millimetres at height during this stage of the build.

Once the beams are in place, the floor slabs are laid and then filled using a non-shrinking grout designed by Corestruc to provide high weather proofing properties. This is in addition to the good curing traits of the material, which achieves a 30 MPa and even exceeds 60 MPa within the traditional 28 days.

At the time of writing, Corestruc's team was forging ahead mainly working standard shifts to allow the various trades to access the site as soon as possible, with brick works scheduled to commence in June this year.

While Magwabeni remains impressed with the overall performance of the company and its pre-cast building solution, he says he is excited to be part of the deployment of a modern construction technique in the property development sector. ●

CHRYSO® Fibre Range

The **CHRYSO® Fibre** range offers the following benefits to concrete:

- Provides post-crack control strength similar to mesh reinforcement
- Reduces the occurrence of plastic shrinkage and plastic settlement cracking
- Enhances the long term durability of concrete

Through its technical partner, Adfil, **CHRYSO** will offer a design service that creates the most cost effective and optimum solution by looking at parameters specified by engineers and fibre dosages.

Contact your local **CHRYSO** representative today.

Gauteng (Head Office): 26 Malcolm Moodie Crescent, Jet Park
T: +27(0)11 395 9700 | Sharecall: 0861 CHRYSO

Concrete Crack Control

CHRYSO
INNOVATION IS OUR CHEMISTRY