

# New precast concrete wall system accelerates water delivery in Mpumalanga



*Corestruc is able to construct the walls and roof in as little as three months on site, while the manufacture of the structure takes place at the factory during the earthworks and construction of the foundations.*

**A** new precast concrete reservoir wall system has been successfully deployed on two water schemes that will significantly strengthen drinking water supply to areas of Mpumalanga.

Both project sites provided an ideal opportunity to refine the system ahead of its commercial launch by Corestruc, a leading South African precast concrete specialist.

The first 10 ML command reservoir was built by Corestruc in KwaMhlanga and the second such structure in Bundu. In both instances, the new precast concrete wall technology was used in combination with the company's tried-and-tested modular roof structure.

Notably, this is the first time that a South African municipality has used Corestruc's precast concrete wall system, based on what is considered to be international best practice and adapted to unique local conditions.

Monde Consulting Engineers and Ceenex motivated the use of the new technology to representatives of Thembisile Hani Local Municipality to significantly accelerate the construction of the two structures as vital components of the water schemes.

Using the system, a reservoir wall for a structure of this size can be built in as little as five to six weeks, while also providing significant cost-savings in the construction of larger reservoirs.

Meanwhile, Corestruc is contractually liable for the performance of all its systems, which helped allay any initial concerns regarding the use of the new technology on these important projects.

The walls of both structures comprise 60 precast concrete panels, each weighing eight tons, and are 9,8 m in length and 16,4 m in width.

Manufactured at Corestruc's factory, they are transported to site and then placed on top of the ring-beam that is built by the main contractor once the centre portion of the structure, comprising precast concrete columns, beams and hollow-core slabs, has been completed.

The precast concrete wall panels, as well as the four buttress panels were manufactured using specialised forms that were designed and produced by CoreEngineering.

As essential components of Corestruc's post-tensioning system that assist in reinforcing the walls both vertically and horizontally, the buttress panels contain many cast-in com-

ponents that were all manufactured by the company's own engineering department.

CoreEngineering also designed the three-dimensional prints that are used to secure the rubber cast that serves as a temporary shutter for the grout.

Ceenex and Monde Consulting Engineers worked closely with Corestruc to refine the system for these two projects.

Special attention was also given to the grouting process, the most time-consuming and intensive process of the entire construction phase.

At both structures, about 6,6 km of post-tensioning ducts and cables were installed by hand between the joints of the wall panels, before the grout could be pumped around the circumference of the reservoir.

The grout has been designed to reach a compressive strength of 100 MPa within four days and to further react when the medium comes into contact with water when the reservoir is being filled.

Designed by Corestruc, it is blended and packaged by Epox-erite, a leading South African construction chemicals specialist.

As part of the service offering, the company also undertakes regular testing of the material to ensure a consistent high quality of supply.

The grout underwent extensive testing ahead of its application, and Corestruc even brought its own water to the first construction site in KwaMhlangu to ensure it achieved the desired reaction.

Importantly, the grout has to be very flowable to be pumped through all of the post-tensioning ducts from a single position using two pumps in a process that takes up to two days to complete.

It is pumped in a controlled manner and the working time of the grout is extended by cooling it down to seven degrees Celsius.

Willie de Jager, managing director of Corestruc, concludes that he is proud to be associated with Ceenex and Monde Consulting Engineers, both respected participants in water infrastructure, and lauds Thembisile Hani Local Municipality for its visionary approach to service delivery. ■

**More information from Corestruc,  
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