BRINGING WATER TO KATLEHONG

Fast-tracking construction programmes benefits from a recast approach, says specialist precast concrete structures manufacturer Corestruc.

EKURHULENI METROPOLITAN MUNICIPALITY is addressing the pressing need for water supply upgrades in Katlehong which, together with Thokoza and Vosloorus, is the second largest township in Gauteng after Soweto.

Together with consulting engineers TLS Engineers & Project Managers, and civil engineering contractors Civcon and QC4 Civils, the municipality is delivering a new reservoir that will bring significant relief to this high-density area.

Built with six 16.15 m by 4.2 m buttresses for post-tension anchors, the 35 Ml reservoir has an internal diameter of 54.4 m, as well as a wall height of 16.15 m and wall thickness of 450 mm.

Construction of the wall and installation of the post-tensioning system followed the installation of the internal pipes, pouring of the reinforced concrete foundation, installation of load-bearing pads for the wall, and completion of the subsurface drainage system. This programme was divided into three sections and four lifts.

Precast roof

Right from the design stages, it was decided that the roof of the structure would be constructed with precast concrete elements to save significant time on the construction programme. More than 2 300 m^2 of slabs, each up to 250 mm deep, make up the roof of the reservoir. They are supported by 16 columns and 18 beams, weighing a total of 12.3 t and 7.5 t respectively.

The precast elements were manufactured by Corestruc and stored prior to being delivered to site. Installation of the precast items started when 80% of the walls had been cast. An opening was left just wide enough for Corestruc's team to access the inside of the structure with a mobile crane.

Led by a seasoned surveyor equipped with a state-of-the-art theodolite, Corestruc's team lifted and fastened the components into place, achieving tolerances of around 20 mm at heights of 15 m. A total of 2 000 m^2 of precast items was installed in as little as eight working days – a feat Corestruc's Willie de Jager attributes to the extensive upfront planning implemented on all of the company's projects.

"Nothing is left to chance," says De Jager. "Each component is manufactured in a closely monitored production cycle with extensive pre- and post-checks in place to ensure absolute accuracy. We also undertake rigorous planning before we arrive on-site to ensure a seamless operation."

The choice of connections was also key to the swift production rate achieved on-site. "Selection was already done in the design stages where Corestruc's advice was essential in helping engineers strike a delicate balance between the price and practicality of the connections," he says, adding that the cost of constructing reservoir roofs in this manner compares favourably with in situ methods. 3S