Precast-concrete
Reservoir System

Since 2009, Corestruc's unique modular reservoir system has enabled municipalities and their professional teams to significantly accelerate the delivery of drinking water to rapidly-expanding urban and rural areas of South Africa.

CORESTRUC (PTY) LTD

Construction of Concrete Pre-Cast Structures

Simultaneous Construction of the Floor, Walls and Roof

Our modular system enables the construction of the floor, walls and roof simultaneously to deliver the infrastructure in a fraction of the time it takes using conventional *in-situ* methods.

Our approved manufacturers complete the roof and wall systems at their factories in record time while the principal contractor undertakes the earthworks and the reservoir floor.

This is opposed to conventional in-situ techniques where work is restricted to one or two faces at any given point in time.

Modular Roof Structure

Corestruc first installs the centre portion of the roof system, comprising precast-concrete columns, beams and hollow-core slabs.

The process starts with the installation of the columns onto the in-situ bases that have been prepared by the principal contractor while maintaining constant interaction with Corestruc to ensure high levels of accuracies. Led by a seasoned surveyor equipped with a state-of-the-art theodolite, we are able to achieve tolerances of between about 20 mm at heights during the installation of the roof structure.

Prefabricated Wall Panels

Corestruc starts dispatching the wall panels to the construction site on a just-in-time basis once the ring beam has been completed by the main contractor.

They are lifted directly from our truck trailers and placed on top of the ring beam using our own mobile crane. The first panel is supported by props that are removed once it has set and the remaining precast-concrete elements are then placed against the other to complete the reservoir wall. Again, Total Station technology is used to precisely install each panel, with our team maintaining tolerances of about 5 mm.

We are able to manufacture up to 10 reservoir wall panels of various widths and lengths at a time at our factories. This is in addition to the four buttresses that are used to reinforce the wall during the post-tensioning process.

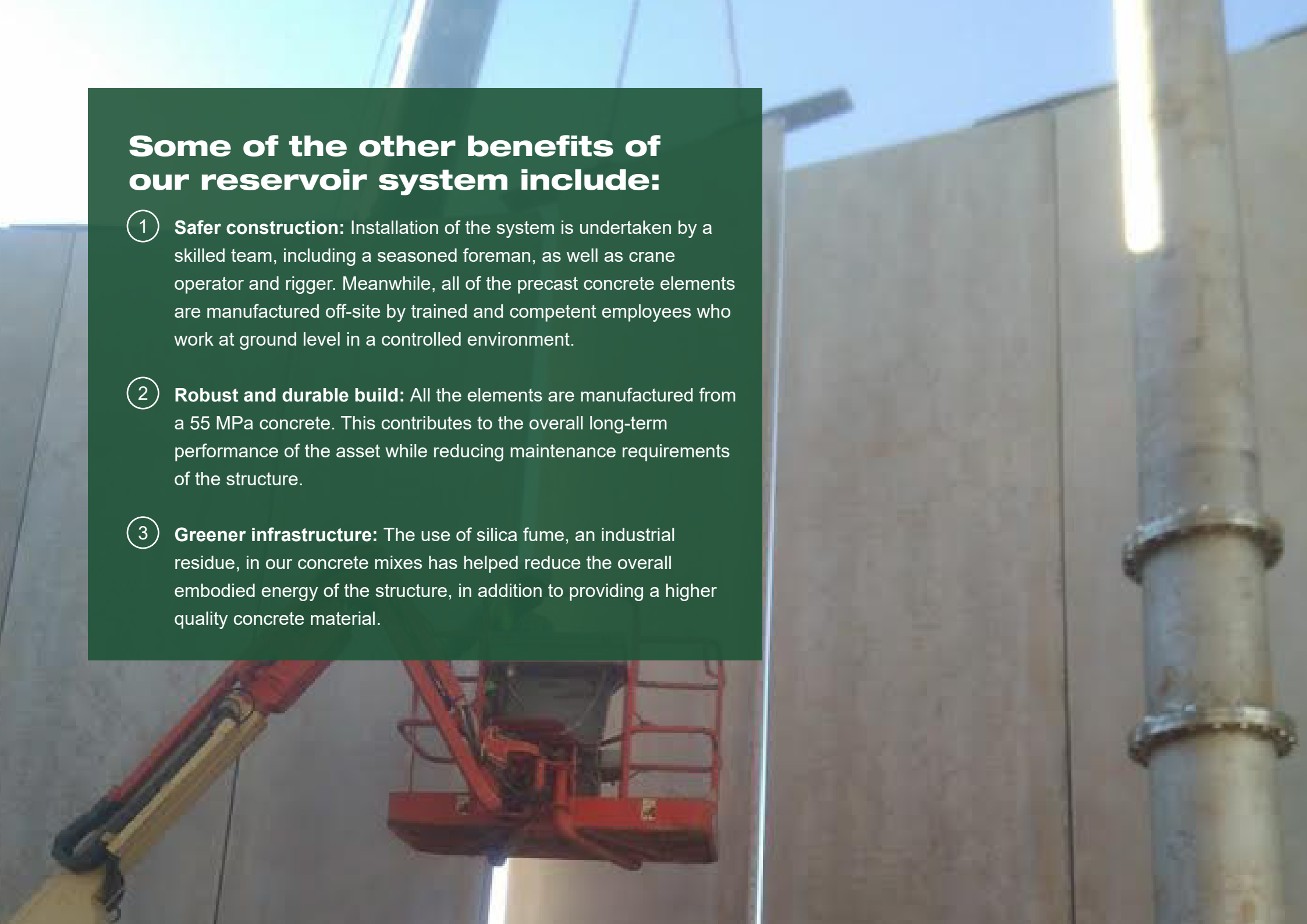
A Watertight Structure

Corestruc's unique grouting and post-tensioning process ensures a watertight structure.

We use vertical and horizontal tensioning to resist applied forces. This is opposed to conventional construction methods where reinforcing and post-tensioning is used to control applied forces. Meanwhile, 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.

Cost-Effective Large Reservoir Construction

While the cost of the system is comparative to in-situ techniques on smaller structures, Corestruc's reservoir technology also provides a more affordable means of constructing larger reservoirs. This is where the real value of the system is being realised, considering the growing backlog in water infrastructure and the pressure municipalities are under to better manage their dwindling budgets.



Some of the other benefits of our reservoir system include:

1. **Safer construction:** Installation of the system is undertaken by a skilled team, including a seasoned foreman, as well as crane operator and rigger. Meanwhile, all of the precast concrete elements are manufactured off-site by trained and competent employees who work at ground level in a controlled environment.

2. **Robust and durable build:** All the elements are manufactured from a 55 MPa concrete. This contributes to the overall long-term performance of the asset while reducing maintenance requirements of the structure.

3. **Greener infrastructure:** The use of silica fume, an industrial residue, in our concrete mixes has helped reduce the overall embodied energy of the structure, in addition to providing a higher quality concrete material.

Complementing Labour-Based Construction Methods

By harnessing the efficiencies of precast concrete technologies, client bodies have been able to fast-track infrastructure delivery in line with government's employment and skills development agendas in the construction sector. Notably, the many main contractors with which Corestruc has worked have met all of their clients' stringent socio-economic targets. Ample opportunity for employment, as well as skills development and training was created for members of local surrounding communities during the earthworks. This is in addition to the construction of the floors, inlet and outlet chambers, as well as pipelines of the reservoir. Piping and construction materials are also usually procured from local small black-owned businesses in the vicinity of these projects.

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