

Meeting Cape Town's housing needs

OWING TO THE URGENCY of the N2 Gateway housing project providing thousands of new low-income houses, as well as the densification that is taking place in the catchment area of the Zandvliet Wastewater Treatment Works and current overflow problems experienced in the existing sewer system, the City of Cape Town invited tenders for the design and construction of a new Delft bulk sewer.

The R2,3 billion N2 Gateway project is set to change the lives of 22 000 households living in the N2 informal settlements and is one of the most talked about assignments in Cape Town.

THE TEAM

Sobambisana Community Developments, a consortium, was the successful tenderer and appointed a joint venture contractor consisting of Asla Construction and Power Construction, two of the leading construction companies in the Western Cape.

The consulting engineers for Sobambisana on this project were the leading consultants, Kwezi V3, who was responsible for some 75% of the design, and Bergstan, who designed the remaining 25% of the pipeline. The City of Cape Town appointed Stewart Scott International to act as project managers on behalf of the city.

Team engineers Adrian Coetzee and Johan Prins from Kwezi V3 Consulting Engineers in Bellville recall the various challenges on the project.

'Our investigation on the capacity of the existing main sewer, which was done almost two years ago, led to the City of Cape Town going out on tender for the construction of the new proposed main sewer pipeline.

'The pipeline would have adequate capacity for the new 22 000 homes together with the future sewage flow in the whole drainage area to the Zandvliet Waste Water Treatment Works. The tender was eventually awarded to the Sobambisana Consortium in April 2005, since then we have been actively involved with the feasibility phase for the sewer line and finally the final designs on the project,' explains Prins.

One of the challenges during the design and construction of the sewer pipe line was to allow for adequate drainage for the homes. Based on the data obtained in the previous reports, this would require a pipe of a proportionately large size to be constructed due to the ground constraints.

'We followed the existing sewer line route as this was the most viable route to follow. This led us to cross over and under many large existing services with diameters between 800 mm and 2 400 mm,' said Prins.

'The existing pipeline starts just at the top of Kuilsriver and Bellville and runs all the way down to the Zandvliet works. The new pipeline was therefore an upgrade of the existing line. We conducted the preliminary designs of the whole pipeline in order to determine the flow capacity of the first phase of the pipeline where construction could commence,' explains Coetzee, illustrating the scope of the venture.

THE INVESTIGATION PHASE

Collecting information for the preliminary designs on the project was problematic with most of the team members that worked on the previous plans no longer working for the council. 'We were lucky to retrieve some of the original plans from Tygerberg, Oostenberg and even Stellenbosch municipalities. We then used the as-built information together with GIS data of the total catchment area to create a model with the use of interactive design package Civil Designer.'

'One of the challenges that we faced was constructing the sewer line above and below the existing services while still being able to connect to the works and invert levels. The whole project was based on the same principle as the existing gravitational pipeline,' notes Prins.

CONSTRUCTING THE NEW PIPELINE

The new pipeline had to be adequate for flows and it was therefore important to plan with the assumption that the entire catchment area would eventually be populated. 'The old pipeline, being between 25 and 30 years old are linked at various key positions with sluice gate manholes so that certain sections of the existing manholes could be shut down to minimise flow,' said Coetzee.

'This was done in order to allow the existing pipeline to be refurbished so that it could act as a backup in the event of an emergency. The sewer pipe will eventually handle a maximum capacity of 4 623 litres per second in peak wet weather flow at its bottom section,' notes Coetzee.

A section of the housing project has since been completed, with the first few occupants having received the keys to their homes last month. □



Source:

[http://www.saice.org.za/downloads/monthly_publications/2006/
CivilEngOct2006web/#/0](http://www.saice.org.za/downloads/monthly_publications/2006/CivilEngOct2006web/#/0)