

Construction of the Matsapha Wastewater Treatment Works



Wheatley Orwin
Junior Site Agent
Inyatsi Construction Ltd
wheatley@inyatsi.co.sz

THE SWAZILAND WATER SERVICES Corporation awarded Inyatsi Construction a tender to construct a Wastewater Treatment Plant and Outfall Sewer located on the outskirts of Matsapha in Swaziland. When operational, this plant had to be able to process up to 20 Mℓ of wastewater per day. Practical completion was awarded in September 2014.

The scope of works involved the construction of 7.5 km of pipeline connecting the existing sewerage network to the new plant. The pipes were precast concrete pipes, spigot and socket 75d class and 100d class, depending on the depth of the pipeline. The diameters varied from 450 mm

to 900 mm. Various watertight structures were constructed at the plant – from the complex inlet works to the 20 Mℓ biological reactor. Offices and dwellings for the future plant staff were also built, as well as the dewatering building and electrical rooms. The internal road network was constructed with interlocking pavers, and the 3.5 km access road was surfaced with a single-seal finish.

The challenges which were encountered generally revolved around the topography of the area. As this plant was to be gravity-fed from the existing sewer networks in Matsapha, it would have to maintain the necessary gradients for the



Part of the outfall sewer crossing a swamp

raw sewage to flow. As there was a climb in the ground level on the direct route between the existing sewer lines and the new treatment plant, the best way would have been to take the pipeline around this obstacle by following the geographical contours. However, the most direct route along the contour path was not possible, due to factories and warehouses in the already established industrial area. This meant that the only available routes pushed the pipeline closer to the swamplands surrounding the Lusushwana River. A significant portion of the proposed pipeline would have been inaccessible as a result. The solution was to construct a permanent access road adjacent to the pipeline, using dump rock, followed by a geotextile cloth, and finished with a compacted gravel layer. Trucks delivered rock to the edge of the path, and an excavator placed the rock in front of it, creating a rock bridge over the river. This allowed access to the pipeline route for construction, while also serving as a path for future service maintenance.

The success of this project, which was completed within budget and on time, can be attributed not only to the professional working relationships between the client, engineer and Inyatsi Construction, but also to the application of the principles of QCD – Quality (do it right the first time), Control (control every last little detail of every action to ensure that it is done right the first time) and Discipline (to continuously do this every time and in everything).

The construction of this plant has eliminated the need for the ponds which were being used for treatment, but which were no longer adequate because of the ever growing industrial area in Matsapha. This new plant will also ensure that downstream communities will not be subjected to environmentally unacceptable effluent discharged into the river. The size of the new plant will furthermore enable the construction of the Ezulwini Sewerage works, which will cater for the continued growth of the entire area. This is an important development area in Swaziland, boasting various hotels, shopping centres, offices, residential areas and other ongoing developments, two of which are the construction of an International Convention Centre and a five-star hotel (Inyatsi Construction is involved in both these contracts). □

Part of the outfall sewer river crossing



The treatment plant approaching final stages of completion



Biological reactor filled with water for water-tightness testing

