
Springrove Dam

Building FOR THE FUTURE

The recent, crippling drought in KwaZulu-Natal brought the critical importance of water to the fore. Water supply infrastructure, along with a need for engineering skills, was put in stark relief.

The first principle of problem solving is to look to history as someone, somewhere, has, in all probability, solved your problem already. While this is true, one still needs to implement the solution. Herein lies the crux of the matter. Without the right people, possessing the necessary skills and experience, no solution, no matter how brilliant, will work. This is particularly true of water supply infrastructure. Fortunately, in South Africa, we don't have to look very far to find these people. We have a home-grown, problem-solving, solution-implementing civil engineering company right here in eThekwini. Celebrating 96 years of service, Knight Piésold Consulting is a Proudly South African company. Established in 1921 with a single office in Johannesburg, the firm today has offices in 14 countries. Its "deliver now, build for the future" approach, driven by a policy of skills retention, black economic empowerment and investing in young engineering graduate development, has produced a carefully balanced set of engineering skills and expertise. Knight Piésold operates "centres of excellence" in each town or city in which it operates, with KwaZulu-Natal being a centre of excellence for water supply infrastructure. With innovation and first principles in mind, state-of-the-art information communications technology and a well-defined internal project management and quality-control system, Knight Piésold Consulting's various centres are able to work seamlessly and effectively, on a national and international basis. The KwaZulu-Natal centre operates under the leadership of Amal Doorgapershad, regional manager for the province. Amal is a professional civil engineer with over 22 years of experience in the field of bulk water supply. Doorgapershad points out that Knight Piésold has undertaken projects in the eThekwini municipal area since the early 1990s, well before the consolidation of the previous council areas into the single eThekwini Metropolitan Municipality. He states that eThekwini is a key client for Knight Piésold and the firm will continue to provide the highest standard of professional services to the municipality and its residents.

While each project is different, local knowledge and global expertise enable the development of effective solutions to meet environmental, social and economic challenges. According to Doorgapershad, past eThekwini Municipality projects completed by Knight Piésold, have improved the living conditions of thousands of Durban residents. When the Western and Northern aqueducts are completed, these projects will benefit many more thousands of people, particularly those most in need of a reliable, basic water supply.

With eThekwini's population of 3.45 million people – growing at a rate of about 1% annually – the ever-increasing demand for water and electricity requires ongoing infrastructure development. To accommodate an estimated additional 8 500 families settling in eThekwini each year, significant infrastructure projects are needed. Knight Piésold has played a leading role in the following key projects that will have a positive impact on the lives of Durban's residents for decades to come.

The Western Aqueduct

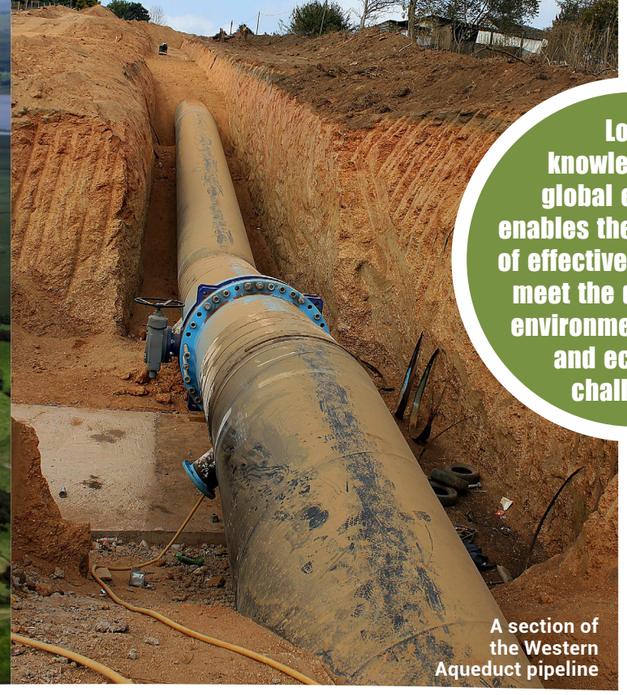
The Western Aqueduct is the single largest water infrastructure project undertaken by eThekwini Municipality. It will bring water into Durban from the Midmar Dam and the recently constructed Spring Grove Dam, and will meet the needs of the Greater eThekwini region for the next 30 years.

It will provide additional capacity of 400 Mℓ of water per day to augment the 900 Mℓ currently consumed daily by the city and is, therefore, of strategic socio-economic importance to the eThekwini region. The project consists of approximately 73 km of welded steel pipelines with diameters ranging from 1.6 m to 0.5 m. Its route generally runs along existing municipal roads through the eThekwini region from Umlaas Road, terminating at Ntuzuma, Pinetown and Tshelimnyama. For Phase 1 of the Western Aqueduct, which measures 20 km and stretches from the Umlaas Road Reservoir to Inchanga, Knight Piésold was the lead consultant in a joint venture with Naidu Consulting. For Phase 2, which continues from Inchanga to Ntuzuma, Knight Piésold is the lead consultant in a joint venture with Royal HaskoningDHV and Naidu Consulting. Phase 2 is presently under construction and is expected to be commissioned in 2017.

WESTERN AQUEDUCT

400 Mℓ
The capacity of water the project will add to the 1.1 million megalitres of water currently consumed per day by the city.

73 km
of welded steel pipelines of diameters ranging from 1.6 to 0.5m make up the project


A section of the Western Aqueduct pipeline

Local knowledge and global expertise enables the application of effective solutions to meet the demands of environmental, social and economic challenges


Midmar Dam


Pumping chamber

The Northern Aqueduct

Owing to the rapid expansion of residential, commercial and industrial developments in the northern regions of Durban, the eThekwini Municipality initiated the Northern Aqueduct Augmentation project. Phases 1, 2 and 3 of the project were awarded to the NAC JV, for which Knight Piésold is the lead consultant in joint venture with Naidu Consulting.

- **Phase 1** involves the construction of a 1 200 mm diameter steel pipeline connecting the existing reservoirs in Phoenix to the existing reservoirs in Umhlanga and Waterloo, with a feed to the new Blackburn Reservoir.
- **Phase 2**, for which construction has been deferred, involves the construction of a 1 200 mm diameter pipeline between the eMachobeni area and the Phoenix 2 reservoir, which will create a link between the current Western Aqueduct pipeline project and the northernmost portions of the eThekwini water supply network.
- **Phase 3** involves the construction of a 1 200 mm diameter steel pipeline connecting Duffs Road to Phoenix. Construction of phases 1 and 3 is well advanced.

Emoyeni Reservoir

The Emoyeni Reservoir, a 30 Mℓ reinforced concrete reservoir project in the suburb of Hillcrest, Durban, is presently moving from design to the construction phase. This reservoir will provide 48 hours of stored water capacity. To create space for the proposed new reservoir, the existing 5 Mℓ reservoir will need to be demolished. As the appointed consulting engineers, Knight Piésold has completed the reservoir design as well as hydraulic modelling of its supply zone to identify reticulation network improvements. The construction contract tender was advertised in March 2017.

Mini hydropower

The eThekwini Mini Hydropower project is a study into the feasibility of generating electricity using the residual energy in eThekwini's existing pipeline network. Mini hydropower, usually defined as being less than 500 kW, captures the energy in flowing water and converts it to electricity. Power generated may be transferred directly to the municipality's low-voltage electricity grid for direct use by consumers. Knight Piésold was appointed to undertake a detailed feasibility study for the construction of mini hydropower facilities in eThekwini. The study demonstrated that such schemes were feasible in parts of the water supply network and showed a positive return on investment.

These projects illustrate the nature and extent of Knight Piésold's capabilities in water supply infrastructure. ■

Doorgapershad's team
Based in Westville, Durban, its primary services offerings include:
- bulk water supply feasibility studies
- numerical modelling of pipeline systems, including transient analyses
- conceptual, preliminary and detailed design of water supply infrastructure
- contract administration and construction supervision of water supply projects.


Amal Doorgapershad, regional manager: KwaZulu-Natal

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