VIRTUAL
CONSULTING ENGINEERS

MAREKELE KINGFISHER DAM REHABILITATION

CIVIL ENGINEERING

ENGINEERING PERSPECTIVE

Civil engineering organises the movement and retention of natural materials, people and goods. This work is achieved through the spatial integration of structures and flow paths. Novel approaches rely on life cycle thinking, with learning-from-nature, self-regulating systems and the ease of operation and maintenance, for:

- Bulk water supply, distribution, sewerage collection and handling
- Water sensitive urban design, stormwater attenuation and water quality objectives
- Traffic and transportation planning, road structures and pavement design
- Geotechnical investigation for foundation of earth and concrete structures

PROFESSIONAL SERVICES

Virtual Consulting Engineers blends industry experience with first principles through all project stages, from inception to design and construction. We combine judicious use of standard designs with customised spreadsheets and software packages:

- EPA-SWMM (Storm Water Management Model) is used for analysis and design of open channel flows, for stormwater and sewerage, from steady state to peak propagation
- EPA Net is used to model flow of water through networks
- SLOPE/W is used to analyse stability of earth structures
- AutoCAD and Civil3D is used to integrate design and drafting

Our contract documentation is rooted in *SANS 1200 Standardised Specification for Civil Engineering Construction*, which is augmented or exchanged with the different parts of *SANS 2001 Construction Works* for technical descriptions of materials and workmanship. We also provide in-house quantity surveying services.

PROJECTS

Zonstraal Border Line Base Dam (2008)

Department of Public Works

The earth wall dam at Zonstraal border line base was rehabilitated after it was found at risk of breaching. The work included repair and recompacting of the wall, creating stone pitched wave protection and construction of a new concrete spillway. A water abstraction tower with subsoil drain was constructed for bulk water supply.

George and Knysna Prisons: Roads and Stormwater (2016)

Department of Public Works / Correctional Services

Reinstatement of all asphalt surfaces for internal roads, paving areas and repair of stormwater infrastructure at George Prison complex. Complete rehabilitation of access roads, paving, earth embankments and stormwater infrastructure at Knysna Prison complex. Design and specifications had to include the use of materials already on site to reduce costs.

Marakele Kingfisher Dam (2017)

Marakele Private Game Reserve

Kingfisher dam wall, in the Matlabas River, was repaired with a new 80m concrete anchor beam along the length at the base, with weeping holes and a rock filter that would block up existing leaks with silt over time. Energy dissipating structures were constructed as part of the new spillway

Paarl Allandale Prison: Fence, Roads and Stormwater (2018)

Department of Public Works / Correctional Services

At Paarl Allandale Prison, the damaged existing fence was replaced with new high security perimeter fencing with seismic sensors to detect disturbance of fence panels. A low maintenance gravel access road for fence patrols was also constructed on a raised sub-base to integrate with the stormwater drainage.

Lebombo Border: Bypass Truck Road (2019)

Department of Public Works

Lebombo between South Africa and Mozambique is one of the busiest land ports of entry. Over many years, cargo carriers have damaged the dedicated bypass road for trucks. The road was upgraded to improve traffic flow for greater capacity, complete with new parking area with rehabilitated sub-base and pavement.

Lebombo Border: Fence and Stormwater (2020)

Department of Public Works

Replacement of a section of border line fencing between South Africa and Mozambique with a new security fence. The steep terrain required precise levelling of steps. All stormwater is routed around the fenced area, with energy dissipating structures and redistribution of flow over land towards the Incomati River below the port.

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