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## High-quality engineering services drive successful completion of road rehabilitation project

JG Afrika, a leading South African engineering consultancy, played a prominent role in the successful rehabilitation of a 58,4 km section of the R399 on behalf of the Western Cape Government's Department of Transport and Public Works.

Importantly, the R304,6-million construction programme created many employment opportunities for community members in the vicinity of the works, while serving as a fertile training ground for several local emerging contractors. This complements the vital role that the rehabilitated infrastructure is already playing in providing many road users with a safer and more efficient means of travelling between Piketberg and Velddrif.

The achievement stands out as a major highlight of the project for Jürgen Gentz, an executive associate of JG Afrika, which was appointed by the department to provide design and construction supervision services.

"Our client wanted the road rehabilitation programme to create many employment and skills-transfer opportunities for communities in the area. This project certainly delivered in this regard, considering that more than 300 people from local communities were employed when construction peaked, while about 17 emerging contractors were trained by the main contractor during the 35 month construction phase," Gentz says.

The firm's pavement-engineering specialist started working on the project in 2008, when

JG Afrika was first appointed by the Western Cape Department of Transport and Public Works to provide detailed design engineering services for the project.

Focus was on Main Roads 529 and 527, where collapsed mole tunnels in the layers had led to an undulating road surface. The already low road safety levels were also compounded by the very narrow carriageways.

Built in the 1960s, the roads now carry 1 700 vehicles a day. Traffic on these roads heavy commercial vehicles, such as interlink travelling between the Northern Cape and the Port of Saldanha, as well as trucks operating from a cement factory in the area.

The road has undergone periodic maintenance over the years and extensive repairs to the damaged layers have also been very costly.

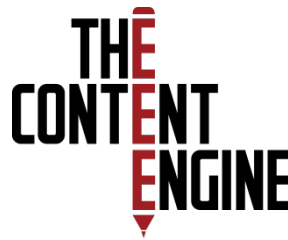
One of the challenges was, therefore, developing and implementing a long-term solution to mitigate future damage to the infrastructure by the large mole population living in the sandy area, in addition to widening the existing carriageway.

“This was the most complex aspect of the design phases. We decided to deploy impact-compaction technology to first create a solid and uniform platform, before recycling and cement stabilising the road layers to a depth of 250 mm to prevent future tunnelling by moles. A 150 mm-thick crushed stone base layer comprising aggregate that was imported from a commercial quarry was then placed and the final road surface completed with a 19 mm thick Cape Seal,” he says.

Meanwhile, the road was widened to a provincial Class 3 status, with the new 9,8 m-wide carriageway comprising two 3,4 m-wide lanes, as well as two 0,9 m-wide surfaced shoulders and two 0,6 m-wide gravel roundings.

Both Platkloof River and Boesmans River bridges also had to be widened to accommodate the new road cross-section. This aspect of the work programme was limited to the superstructure, with broadened sections cantilevered off the existing bridge decks.

Other components of the work scope included lengthening existing pipe and box culverts by between 2 m and 4 m; constructing additional pipe and box culvert crossings; and providing erosion protection at inlet and outlet structures of the culverts. Moreover, 1,05 m wide concrete-lined side drains were constructed in cuttings and 0,7 m x 0,5 m earth side drains built as part of the project.



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The construction works were awarded to Group Five, which commenced operations in November 2014.

While Gentz describes the rehabilitation of the R399 as a fairly straight forward road construction project, he says that the rehabilitation programme did present its share of challenges. This includes accommodating the many road users during construction, while ensuring a safe and productive site.

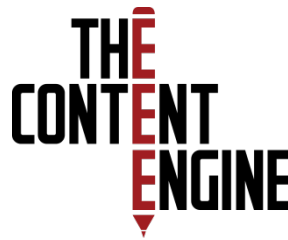
A 'Stop/Go' system with traffic signalling was implemented to allow construction to be undertaken in half-widths. A maximum of four half-width construction sections were permitted throughout the programme and the work area was limited to four kilometres with 4 km distances in between the successive work zones.

The confined working faces were also a major challenge, especially for the impact-compaction and road-recycling teams using heavy mechanised equipment on the already narrow road sections.

Despite these onerous working conditions, Gentz says that the contracting teams maintained an impressive safety track record and production rate throughout the entire duration of the project.

Another complexity was managing the multiple contracting teams working alongside the main contractor as part of the extensive small, medium and micro enterprise development component of the project.

Many of these emerging companies were Construction Industry Development Board (CIDB) Level 2 contractors, and they were tasked with the less onerous aspects of the work scope, such as building the V-drains, installing the guardrails, as well as packing and placing the gabion baskets.



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This training was invaluable and Gentz is confident that the experience gained by these contractors will facilitate their further meaningful involvement in future public-sector road projects in the area.

He also compliments the main contractor for the stellar role that it played in mentoring so many emerging contractors, while still maintaining a swift production rate on site.

This achievement was acknowledged by the Western Cape Department of Transport and Public Works, which also commended JG Afrika for its sound track-record in managing the construction works, demonstrated by the timely completion and high quality of the road works.

The road was designed to have a life of 20 years, and was officially opened to users by the Western Cape Minister of Transport and Public Works, Donald Grant, in October 2017.

Gentz concludes that he is proud to be involved in yet another successful JG Afrika road construction project that will continue to benefit South Africans for many years to come.

#### *Images & Captions:*

[Image]:

[Caption]: In-situ cement stabilisation of subbase

[Image]:

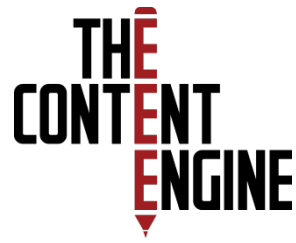
[Caption]: Temporary widening of road for traffic accommodation

[Image]:

[Caption]: Labour intensive construction of gabion retaining wall

[Image]:

[Caption]: Impact rolling of existing road surface



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[Image]:

[Caption]: Excavation of subsoil drains