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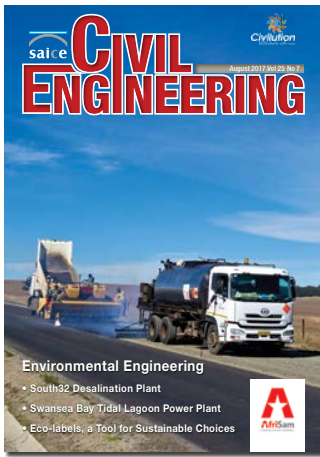
CIVIL ENGINEERING

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Environmental Engineering

- South32 Desalination Plant
- Swansea Bay Tidal Lagoon Power Plant
- Eco-labels, a Tool for Sustainable Choices



ON THE COVER

AfriSam is partnering Tau Pele on a contractor's special maintenance project under way on the R56 between Indwe and Maclear in the Eastern Cape. Some 12 000 tons of AfriSam's Roadstab are being used to enhance the stability of road materials, reduce plasticity and increase strength, thereby improving the durability of the road.



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ON THE COVER

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▶ A padfoot vibratory roller, followed by a smooth roller, compacting material behind a milling machine on a section of the R56 between Indwe and Maclear

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AfriSam works with Tau Pele to overhaul scenic Eastern Cape route

R56: INDWE TO MACLEAR

Farmers, local businesses and tourists alike will soon benefit from the special maintenance project being carried out by Bloemfontein-based contractor Tau Pele on the picturesque but busy R56 national route between Indwe and Maclear in the Eastern Cape.

Work began on the ground for this South African National Roads Agency SOC Ltd (SANRAL) contract – with a value of R635 million – in February 2016, and it is expected to run through to about March 2019 as a result of inclement weather. With cement solutions from construction materials leader AfriSam, the contractor's focus is on the special maintenance of about 126 km of road in Sections 6 and 7 of the R56. The project also includes substantial improvements to the drainage and safety aspects of the road in many areas.

From his site office near Elliot, roughly midway between the project's end points, Tau Pele contract manager, Mark Meredith, outlines the scale of the project. There are 63 company staff members and over 900 labourers employed on the job, involving more than 60 targeted enterprises. In excess of 160 items of plant are at work – from graders, tipper trucks and rollers, to milling machines and water bowsers. To ensure a steady supply of surfacing material, Tau Pele also established its own asphalt plant near Indwe, an emulsion plant at Ugie, and purchases crushed material from Blue Crane, a local quarry near Indwe.



AfriSam's Roadstab is a specially formulated composite cement and is being used by Tau Pele on its R56 contract in the Eastern Cape



Compacting ground between the newly installed gabion and a soft cutting on the R56, before placement of backfill

Operating since 2004, Tau Pele Construction has a CIDB rating of CE9, placing it at the highest level of capacity in the civil engineering category. The company specialises in both new road construction and rehabilitation, and also has expertise in developing urban infrastructure and select industrial projects. With a Level 2 BBEEE contributor grading, Tau Pele has a footprint across South Africa's nine provinces and into Namibia.

“Our focus is on the roadwork, which we are either repairing or rehabilitating as specified, with improvements such as concrete side drains and subsoil drains, as well as installing gabions, replacing fencing and guardrails, and installing new bridge expansion joints,” says Meredith.

According to Meredith, 87 km of road requires repair and resealing, with patching which in turn requires in-situ stabilising of the road layers, and a seal. Where the existing material in the road has lost its integrity, it is removed and replaced with new material.

ROAD REPAIR AND RESEAL AREAS

According to Meredith there are two options here, determined by the severity of the problem. “Depending on the condition of the existing material, we can stabilise with lime, cement and bitumen. But in other sections, we’ve had to undercut the existing pavement layers and replace them with a new rock layer before bringing the suitable material back or replacing the existing layers with newly crushed material, then stabilising and completing with a double seal.”

AfriSam is partnering Tau Pele in the provision of road construction cement, including some 12 000 tons of its Roadstab product. This is a specially formulated composite cement to enhance stability in a range of different road materials. Roadstab improves the engineering properties of soil by reducing plasticity and enhancing strength, allowing for improved durability.

Meredith also explains that much of the damage currently being repaired has been caused by insufficient sub-soil drainage, hence the particular focus on installing extra drainage solutions in many areas.

REHABILITATION AREA

Testing was done by the consulting engineers before the tender was awarded to determine the extent of the rehabilitation sections. This has involved two new layers – a base and sub-base – over the existing road, with a Cape seal surfacing on top.

Two types of surfacing, which both create the black riding surface on the road, are being employed on this project, according to Meredith:

- The double-split seal, which comprises a layer of 19 mm road stone applied onto the road with bitumen, followed by a ‘choke seal’ of 6.7 mm road stone, another layer of bitumen, a second layer of 6.7 mm stone, finally sealed off with a bitumen fog spray.
- The Cape seal, which comprises a layer of 19 mm road stone applied to the road with bitumen, sealed with a bitumen fog spray and then two layers of bitumen slurry applied to the stone surface.

The addition or replacement of new concrete side drains, kerbs and channel drains in the project scope is contributing

to better water management by helping to engineer the safe drainage of water from the road surface and shoulders. For these types of applications, AfriSam is supplying 6 000 tons of its 42.5N All Purpose Cement (APC) – a popular, specially blended high-quality cement suitable for many applications. The concrete mix designs for this project, using the AfriSam APC CEM 11 B-M(L), were conducted at the AfriSam Centre for Product Excellence in their SANAS-accredited laboratories based in Roodepoort.

In addition, gabions have been used extensively in the road cuttings, and they also help to prevent fine material from being washed into drains and causing blockages. Retaining walls are also being constructed in those cuttings where space on the road shoulders is limited.

LOCAL CHALLENGES AND IMPACT

According to Meredith, the following were some of the local challenges:

- Some extreme weather conditions have been experienced thus far – from high rainfall in summer, to snow and biting cold in winter.



A pneumatic roller runs over the final bitumen seal on a rehabilitated section of the R56 where AfriSam's Roadstab is being used

- Local labour, being from a rural background, do not have much construction experience.
- The logistics of getting material, like cement, to the project, requires careful planning.

Nonetheless, the project is creating numerous work opportunities for local operators and residents. Towards mid-2017 there were over 60 local small enterprises engaged by the contractor, each with a local workforce. Just four of the subcontractors – supplying more specialised services – come from outside the area. SANRAL has noted this contract for extensive use of Level 1 to Level 5 SMME local subcontractors.

The R56 route is a vital supply line for this area, and promises to keep the life-giving traffic moving speedily once this contract is complete.

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New V-drains are installed on the R56 to enhance safe and efficient surface water run-off

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