

McGregor Street, Bloemfontein, South Africa, 2016

Road Rehabilitation using a Foamed Bitumen Emulsion Treated Base Laid Directly on TriAx Geogrid



Foamed bitumen emulsion treated base material being spread by a paver directly onto TriAx Geogrids

BENEFITS TO CLIENT

- The client managed to repair a very busy road in the middle of a commuter hub within a significantly reduced construction period.
- Existing services that lay beneath the roadway did not need to be lowered to allow for the excavation depth required by conventional construction methods. This resulted in a very significant cost and time saving.
- A large quantity of the existing pavement materials were recycled, providing additional cost savings and environmental benefits.

THE PROBLEM

- McGregor Street falls within a very busy commuter hub with high traffic volumes made up primarily of public transport busses and mini-bus taxis. The road was nearing its usable life and need rehabilitation.
- There were shallow existing services in this region of the Bloemfontein CBD. These needed to be lowered in order to excavate to the full depth required by the conventional design.
- User delays and disruption to the significant pedestrian traffic needed to be minimised.
- The existing levels of the drainage system, sidewalks and adjacent private properties had to be maintained.

THE SOLUTION

- The existing road was milled to a depth of 500mm and a 250mm thick sub-base was installed.
- The milling operation was carried out in two stages to separate the existing asphalt and G4 quality base course materials from the poorer existing sub-base material. The existing good quality materials were recycled and blended with commercially sourced G4 material in a foamed bitumen mill to produce a high quality Bitumen stabilised material (BSM). This was manufactured and stockpiled at the Contractors yard on site.
- A layer of Triax TX160 geogrid was laid on the sub-base and held in place using nails with head plates and cable ties.
- Two lifts of 125mm thickness BSM were placed at ambient temperature onto the TriAx geogrid using a paver and compacted.
- A 40mm Asphalt layer sealed the surface of the road.



PROJECT DESCRIPTION

NAKO ILISO were appointed by the Mangaung Metro Municipality to examine and propose rehabilitation options for 1.42km of dual carriageway with 2 lanes in each directions at McGregor Street in Bloemfontein.

The existing pavement structure was evaluated in terms of the South African Mechanistic Design Method using Rubicon software for typical test pit data. After taking deflection readings and conducting visual condition surveys along with intrusive investigations, it was found that the existing pavement on both carriageways had a residual life of between 0.2 to 0.7 million E80s. This related to approximately 1 year to 2.25 years.

Various design approaches were investigated including: deep insitu recycling and chemical stabilisation; construction of a rigid pavement; building a new flexible pavement above the existing one and boxing out to build a new flexible pavement.

Due to the site constraints the consultants opted to excavate a shallower box cut and utilise the proven stabilisation factor of TriAx to achieve the required performance.



CONTRACT DETAILS

Client: Mangaung Metro Municipality

Consultant: NAKO ILISO Consulting Engineers

Contractor: Down Touch Trading

Tensor

THE COMPANY
YOU CAN BUILD ON™

Tensor International Limited
Cunningham Court
Shadsworth Business Park
Blackburn BB1 2QX
United Kingdom
Telephone: +44 (0) 1254 262431
Facsimile: +44 (0) 1254 266867
Email: info@tensor.co.uk
www.tensor-international.com


KAYTECH
ENGINEERED FABRICS

Kaytech Engineered Fabrics
11 Livingstone Road
Pinetown, 3610
South Africa
Telephone: +27 31 717 2300
Facsimile: +27 31 702 0435
Email: supportpntn@kaytech.co.za
www.kaytech.co.za