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SOILFORM
NANO-TECHNOLOGIES

ROAD CONSTRUCTION USING NANO-TECHNOLOGY

GE-NANO

'The game changer in road construction'

SOILFORM
NANO-TECHNOLOGIES

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laying the foundation

GE-NANO

PAVEMENT LAYERS

Our **nano-technology** based product **GE-NANO** enables the use of traditionally available stabilising agents such as bitumen emulsions at much lower application rates, achieving improved strength characteristics and more water resistant layers in roads at lower unit costs. Our **nano-technology** based products have eliminated the use of cement completely.

A stronger pavement or a pavement constructed using predominantly locally available materials would allow for optimization of pavement layer design. This development in road construction involving the use of **nano-technology**, is a game-changer that will dramatically improve the provision of roads at an affordable unit cost.

Engineers should always be striving to meet budget constraints without compromising on quality and pavement performance. This can be achieved through a thorough knowledge of pavement material properties, including mineralogy and the identification of problem materials along with a knowledge of all the available stabilising options including new technologies.

Through the use of **nano-technology** we are able to bring you advantages in the road construction industry using the following products:

- **GE-NANO** to improve road pavement layers.
- **NANO-SIL** to waterproof cracked road surfaces as a cost effective waterproofing maintenance intervention.
- **NANO-PRIME, NANO-TAK** and **NANO-BOND**.

"The provision and preservation of a good transport infrastructure is a prerequisite to economic growth. To be competitive in a micro as well as macro economy, any cost associated with and influencing production and delivery costs needs to be minimised – transportation cost is a crucial component of this competitive regime. The high cost of the upgrading, maintenance and rehabilitation of the existing road infrastructure puts an ever increasing burden on available funds. This existing scenario of high cost increases makes it essential for design engineers to optimise designs using proven technologies and, together with client authorities, investigate, test and use improved seal, stabilisation and material enhancement technologies (e.g. through the use of available nano-technology) that are available and are continuously being developed all over the world."

- Extract from 'The cost-effective upgrading, preservation and rehabilitation of roads – optimising the use of available technologies (SATC 2016)', Prof. G J Jordaan and Mr A Kilian

William Nichol Drive: Compacting micaceous G5/G6 with nano-technology product added for the Gauteng Province Department of Roads and Transport (GPDRT).

TAILORING CUSTOM SOLUTIONS FOR PROBLEM SOILS

Some soils cannot be economically stabilised using conventional stabilising materials, or could present problems resulting in severe premature distress on roads at considerable cost. Typical "problem soils" include materials containing:

- High percentages of mica and/or smectite minerals.
- Sands containing high percentages of crushed sea shells or coral.
- Cohesion less sands.

Identifying the basic composition of generally available materials and of "problem soils" along with laboratory testing with our **nano-technology** stabilising products will lead to selecting the most appropriate and cost-effective stabilising agent to improve the characteristics of these materials for use in the upper road pavement layers. Note that **GE-NANO** would have its key ingredient composition adjusted to suit the soil being stabilised. This adjustment would be done as part of the design process.

Such an approach would lower the risk to both the designer and the road authority and lead to the cost-effective use of generally available materials in the upper layers of the pavement structure, especially for the design of lower category roads.

Refer to **Technical Information Sheet** for further data.