

Secugrid 30/30 Q1 - Unbound Stone Base Reinforcement:

Project:	IRT Phase 2 MyCiti Bus Depot, c/o Spine & Mew Roads, Kayelitsha, Cape Town
Client:	City of Cape Town
Consultant:	GIBB
Contractor:	H & I Construction (Pty) Ltd
Supplier:	Fibertex South Africa (Pty) Ltd
Installation Date:	June 2024

DESIGN & CONSTRUCTION

As part of the expansion of the new MyCiti Bus System, this 15Ha site will serve as a base for the service. The depot will initially accommodate 290 buses with workshops and washbay facilities.

END APPLICATION

In keeping with the design for sustainable urban drainage to replenish existing ground water availability, the hard standings consist of 80mm interlocking permeable pavers, laid on a sand bedding with a 400mm thick 53mm clean stone base, placed in two 200mm compacted layers, encapsulated between two non-woven geotextile separation layers. This in-turn would replenish the subterranean water reserves which supply a comprehensive borehole system to be used for the wash bays.

CHALLENGE

To enhance the CBR of the clean stone base layer as opposed to a bound base, while limiting the stone thickness required. Permeable pavements offer environmental benefits like stormwater management, but their unbound granular base can be susceptible to stress concentration and rutting.

SOLUTION, PRODUCT & SAVING

The inclusion of two layers of **Secugrid 30/30 Q1** geogrid below and midway of the stone base layer addressed this challenge, by promoting improved stress distribution through two key mechanisms:

- **Mechanical Interlock:** The geogrid's open aperture design allows for the infill of gravel or soil particles. These particles become mechanically interlocked with the rigid bars of the geogrid, creating a composite structure with enhanced tensile strength and load bearing capacity. This effectively transforms the unbound aggregate into a more unified and laterally restrained mass, better able to resist deformation under stress.
- **Frictional Enhancement:** The textured surface of the Secugrid bars increases the frictional interaction between the geogrid and the surrounding granular material. This friction helps to dissipate concentrated loads (stresses) from traffic or rainwater, preventing them from accumulating in localized areas. The geogrid essentially acts as a horizontal stress transfer layer, distributing the load more evenly across the entire pavement system.

By combining these mechanisms, **Secugrid 30/30 Q1** geogrid promotes a more uniform stress distribution within the permeable pavement structure. This reduces the potential for localized bearing failures and rutting, leading to a more stable and durable pavement with a longer service life. A quantity of **106 400m²** has been supplied to the project to date, with an estimated saving of 13 500m³ of stone.

