



## KAYTECH CASE STUDY

# APPLICATION OF A CONCRETE-FILLED CELLULAR CONFINEMENT SYSTEM IN URBAN ROAD CONSTRUCTION

## GEOSYNTHETICS USED

**Multi-Cell® PP:** a honeycombed structure that is manufactured from strips of a coated slit film woven polypropylene tape that are stitched alternatively together to form a three dimensional diamond shaped cells.



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## PROJECT DESCRIPTION

As part of the Special Maintenance of National Route R56 (Section 5: Dordrecht to Indwe), concrete-filled cellular confinement was used for the construction of municipal roads and sidewalks within the town of Indwe.

Block paving was originally specified. However, following a technical and commercial review, the consulting engineer and contractor approved the use of Multi-Cell® PP as a more practical alternative for the remote project conditions.

A total of approximately 22,590 m<sup>2</sup> was installed, comprising 19,680 m<sup>2</sup> of 100 mm depth panels for roadways, and 2,910 m<sup>2</sup> of 75 mm depth panels for sidewalks. The system was installed in 2024 and is performing as intended.

## A BETTER SOLUTION

Concrete-filled Multi-Cell® PP provided both constructability and structural advantages over conventional block paving:

- Eliminated long-distance transport of precast pavers
- Reduced risk of material theft on site
- Replaced the 100 mm G5 base with a 150 mm G7 base
- Removed the need for bedding and quartzite jointing sands

The 100 mm thick cellular confinement system forms 200 mm × 200 mm concrete panels within interconnected cells. This segmented configuration limits shrinkage cracking while enabling effective lateral load transfer through block-to-block interlock. Tight joints reduce surface water ingress, supporting base-layer stability and long-term pavement performance.

The modular nature of the system also simplified placement and finishing, allowing consistent surface levels across large areas.

Roads were constructed in 3 m half-widths to maintain traffic during curing, with a centre-line kerb providing edge control and camber definition. Concrete was placed flush with the cell walls and finished with a broom texture to improve traction.

The installation of over 22,000 m<sup>2</sup> confirms the system's suitability for large-scale municipal road and sidewalk applications, achieving the required quality standards and providing a durable, maintainable alternative to the original paving specification.



## Did you know?



### Durable Design

The cellular design of Multi-Cell® PP eliminates shrinkage cracking and ensures tight joints, protecting the base layer and improving long-term pavement performance.



### Community Impact

Over 30% of the project work was completed by local SMMEs, creating direct employment opportunities in the community.



### Faster Construction

Using Multi-Cell® PP reduced construction time compared to traditional block paving, allowing SMMEs to complete road sections faster.