

Secugrid® - keeping Malaysia's busiest corridor moving with strength that lasts

Base course reinforcement

- **Project name**
LRT3 (Shah Alam Line) - Road Widening & Station Access in Johan Setia, Klang, Malaysia
- **Solution Partner**
Alpha Pinnacle Sdn Bhd, Selangor, Malaysia
- **Owner**
Prasarana Malaysia Berhad, Selangor, Malaysia
- **Consultant**
MMSB Consult Sdn Bhd, Selangor, Malaysia
- **Product**
Secugrid® 40/40 Q1





Fig. 1: Secugrid® as base course reinforcement



Fig. 2: Road in need of repair (left) and reconstruction with Naue Secugrid® geogrid (right)

Building resilience on Malaysia's busiest coastal corridor

The Light Rail Transit Line 3 (LRT3) enhances connectivity across the Klang Valley, Malaysia. At Johan Setia - the line's southern terminus - works included widening and tying in access roads to the station. The site lies on Federal Route 5, a Class T2 trunk road linking directly to Port Klang. This coastal corridor carries heavy container traffic and high-capacity commercial vehicles, demanding resilient pavements with settlement control on soft alluvial silty clays of very low bearing capacity.

Problem - Too deep, too slow, too disruptive

The original Removal and Replacement (RnR) design called for excavating 1.5m of weak soil and backfilling. Though feasible, excavation would have severely disrupted traffic and clashed with viaduct works. Uninterrupted access - critical for Port Klang freight and passengers - had to be maintained, so a solution was needed to ensure performance while keeping works efficient and traffic moving.

Solution - Smart ground improvement with Naue Secugrid®

In partnership with Naue, Alpha Pinnacle proposed a Reinforced Soil Foundation (RSF) using Secugrid® 40/40 Q1 geogrids. Instead of cuts, shallow subgrade preparation limited disruption and earthworks. A two-layer system was used: a Secugrid® layer on the levelled subgrade, 150mm of compacted engineered fill, then a second geogrid beneath the roadbase prior to paving. Lane-by-lane sequencing kept traffic flowing. Secugrid® 40/40 Q1 uses monolithic polypropylene flat bars with welded junctions to deliver 40kN/m biaxial strength and high stiffness at low elongation, providing efficient lateral restraint to control deformation under heavy loads. Immediate mobilisation of tensile stiffness spreads wheel loads, reduces shear and limits rutting/reflective cracking. The result is a stiffer composite layer with reduced strain under repeated traffic, enhanced bearing capacity and limited settlement over soft ground.

Faster, greener, built to last

Avoiding deep excavation and large imported fill accelerated construction, cut material use and lowered the carbon footprint. Single-lane workfronts minimised disruption. The geogrid's rigidity enabled easy placement with minimal wrinkling, and its robustness resisted installation damage under heavy compaction. Using Secugrid® within the base course transformed weak subgrade into a load-bearing composite, replacing deep soil replacement with an engineered, sustainable solution. This approach aligns with JKR ATJ 5/85 for cost-effective road improvement on compressible ground and has proven durable in tropical conditions. Post-construction observations confirmed stable pavement with no cracking or distress.

Conclusion

Transitioning from deep RnR to a mechanically stabilised foundation with Secugrid® 40/40 Q1 delivered comparable bearing performance with > 50% less fill, faster construction with minimal disruption, and lower environmental impact with long-term stability. Naue Secugrid® 40/40 Q1 combines durability, efficiency and sustainability - an optimal solution for challenging ground and demanding traffic.

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