



## GEOFABRICS CASE STUDY



# RAILWAY SUB-BALLAST STABILISATION WITH TENSAR MULTIAXIAL GEOGRID

## PRODUCTS USED

### Tensor® TriAx Multiaxial Geogrid

- Made from a punched polypropylene sheet that is used to form hexagonal structures with triangular apertures to effectively confine and interlock aggregate particles
- Reduces granular layer thickness and CO<sub>2</sub> emissions in construction by up to 50%
- Improves bearing capacity on railway projects and stabilises the rail ballast and track bed to limit the movement and displacement of the rail ballast, leading to a reduction in maintenance
- Durable structure that provides greater stability and stiffness in challenging weather and environmental conditions
- Can be installed quickly, reducing construction costs when building all pavement types over soft ground for standard and heavy vehicle loads

### Bidim® Green Non-Woven Geotextile

- A strong three-dimensional structure with high elongation and equal biaxial strength properties in both directions
- Made with a combination of recycled PET and virgin plastic materials
- Provides excellent filtration, separation, drainage and protection performance
- Reduced need for quarried fill materials and reduced construction times

## PROJECT DESCRIPTION

The Department for Infrastructure and Transport's Port Dock Railway Line Project involved re-establishing the 1 km rail line and train station, which were previously decommissioned in 1981. It provides rail services for those who already call the area home and the many more set to live, work and visit Port Adelaide.

The onsite subgrade presented challenges due to its softness, with a California Bearing Ratio (CBR) of only 2%. Conventional methods for improving the subgrade would have necessitated excavating and replacing the subgrade to a depth of 800-1000mm with structural fill (CBR = 8%).

In response to these challenges, the Public Transport Project Alliance (PPTA) sought an alternative solution involving the use of geosynthetics to enhance the bearing capacity of the track bed and address the foundational issues, thereby ensuring the successful completion of the rail line extension.

## OUR SOLUTION

Geofabrics worked closely with Tensar and recommended a mechanically stabilised trackbed using Tensar TriAx multiaxial geogrid with a well-graded granular material to the client's engineer. This solution was 500mm thinner compared to the conventional remediation strategy.

TriAx multiaxial geogrid and Bidim Green non-woven geotextile (A24) were rolled out onsite and overlapped in accordance with the recommendations from Tensar. A 300mm thick layer of well-graded aggregate, PM3/40 was placed above TriAx multiaxial geogrid to create a mechanically stabilised structural fill layer, with compaction carried out to meet the project requirements. In total, 14 rolls of multiaxial geogrids were installed, covering 4000m<sup>2</sup>. The Geofabrics team were available onsite to provide technical assistance during the installation.

By adopting a mechanically stabilised track bed, the required excavation depth was reduced by 500mm compared to the conventional treatment with a CBR of 8%.

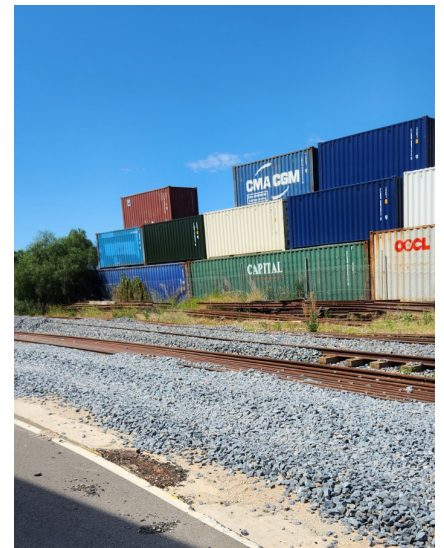
Construction of the railway line has been completed.





**4,000m<sup>2</sup>**  
of TriAx geogrids  
installed

Excavation depth  
reduced by  
**500mm**



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