



# Sub-ballast Stabilisation - Revolutionising Railways

Stability, durability and economy  
with Tensar® TriAx® geogrids

- ▶ Mechanical stabilisation of sub-ballast to reduce construction time and costs
- ▶ Permits up to 50% reduction in sub-ballast thickness (with sustained modulus support)
- ▶ Proven performance in trials and monitored installations
- ▶ Large aperture products for use with recycled ballast



# Mechanical Stabilisation of Sub-ballast to Reduce Costs in Construction



## Tensor TriAx geogrids can be used to:

- ▶ Reduce the thickness of sub-ballast by up to 50%
- ▶ Maintain track geometry for longer by reducing differential settlement
- ▶ Reduce construction carbon emissions associated with aggregate supply
- ▶ Speed up construction
- ▶ Reduce formation excavation and disposal costs

*Tensor TriAx geogrids installed under the granular sub-ballast layer to increase bearing capacity (Belgium).*

## A Great Track Record in Construction Over Soft Subgrades

With the use of Tensor TriAx geogrids, a significant reduction of sub-ballast layer thickness can be achieved with no detriment to the bearing capacity.

This allows for reduced subgrade excavation and spoil disposal resulting in far less imported sub-ballast fill, whilst achieving the target stiffness value required for the support of the ballast.

TriAx is an improved product building on the many achievements of Tensor biaxial geogrids and used successfully in numerous cost-effective installations.

In a monitored project in Cologne, a Tensor geocomposite permitted a reduction in sub-ballast from 1050 mm to 700 mm while maintaining a surface target modulus of 120 MPa. Similarly on the Berlin-Munich line, a 400 mm thick layer of Tensor stabilised sub-ballast wash shown to provide the same surface modulus as a 600 mm thick non-stabilised layer. Furthermore a 600 mm thick Tensor stabilised layer produced twice the surface modulus.

**Tensor**<sup>®</sup>

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