



Tensar[®]



A combination of TriAx TX190L geogrid and anti-pumping geotextile delivered a fast and robust solution to repairing the level crossing for the historic steam railway.

Rapid reaction force

Tensar's TriAx TX190L geogrid played a key role in an innovative approach to replacing a level crossing on an historic railway in South Australia.

CLIENT'S CHALLENGE

A level crossing on the Victor Harbor railway needed to be repaired, after years of trafficking had caused the underlying soft and reactive clay to migrate up through the ballast. SteamRanger Heritage Railway needed a solution that could be implemented in one, 14-hour night possession. The volunteer run organisation had limited funds to carry out the work and were seeking a lower cost solution.

TENSAR SOLUTION

TriAx TX190L geogrid mechanically stabilised the track ballast, reducing the rate of settlement and degradation, and an anti-pumping geotextile separation layer beneath prevented upward migration of clay particles.

The solution halved the amount of excavation required compared with installing a capping layer, speeding up work so it could be finished in one night.

Steamranger

Trackbed stabilisation

📍 South Australia

BENEFITS

50% less excavation required, compared with conventional methods

14 hours to complete a level crossing upgrade

Maintaining track geometry

for longer and extending ballast life



Work was completed in a single 14 hour night shift, minimising disruption to road and rail users.

PROJECT BACKGROUND

A level crossing on the Victor Harbor railway line in Mount Barker, South Australia needed to be repaired. Years of trafficking had led to damage and soft spots of the underlying clay appearing in the surface of the track ballast.

SteamRanger Heritage Railway runs the line and, as a volunteer-led organisation, had limited money to carry out repairs. Coleman Rail approached Tensor's Australian distributor Geofabrics to come up with a low cost solution; one that could be carried out in a 14-hour night shift to fit around train schedules.

Given the ground conditions – soft and highly reactive clay – Geofabrics proposed using Tensor's TriAx TX190L geogrid to stabilise the track ballast, with a specialised anti-pumping geotextile installed beneath, to prevent upward migration of the clay.

TriAx TX190L interlocks with the ballast, confining lateral movement of the particles to create a mechanically stabilised layer, which can reduce the rate of track settlement under trafficking load and substantially reduce maintenance. Design was carried out using Tensor's rail trackbed software SpectraRail.

After the tracks were removed, the team excavated to 300mm below the base of the sleepers and laid the anti-pumping geotextile separation layer directly on the clay. TriAx TX190L was then laid and 300mm of ballast placed over it before the sleepers and tracks were replaced. Vertical panel drains were installed alongside the track before a final asphalt layer was applied.

Geofabrics' approach avoided the need for constructing a capping layer below the track ballast, which would have involved excavating 600mm of clay, rather than just 300mm. The capping layer would have also had to be moisture conditioned, compacted and tested, which would not have been possible in the short construction timeframe.

Client:

**SteamRanger
Heritage Railway**

Contractor:

Coleman Rail

“We saved on excavation depth and capping preparation, facilitating the quick completion of the level crossing rebuild.”

SteamRanger Heritage
Railway

Tensor International Limited

Units 2-4 Cunningham Court Shadsworth Business Park
Blackburn. United Kingdom BB1 2QX

T. +44(0)1254 262431 | Visit: [tensorinternational.com](https://www.tensorinternational.com)

Tensor

Copyright © Tensor International Limited 2018
Registered in England: 503172