Railway Trackbed Treatment
Derby - Proof House
(Birmingham). UK  2004

BENEFITS OF THE TENSAR SOLUTION

Trackbed layer thickness
Reduced Maintenance reduced.

PROJECT BACKGROUND

The line runs over a highly variable formation ranging from sandstone to low stiffness fireclay layers. Poor track geometry over a particularly bad section approximately 1.5km long had led to a history of speed restrictions and repeated traditional maintenance. An alternative, cost effective treatment was required which would better sustain the track geometry.

THE TENSAR SOLUTION

Old ballast and formation was excavated. Network Rail Approved Tensar biaxial geogrid which was placed on the formation and covered with 100mm of ‘Type 1’ sub-ballast followed by a second layer of Tensar geogrid and 300 mm of ballast to the underside of the sleepers. Where a clay formation was exposed an additional 100 mm thickness of sub-ballast was placed over the base geogrid.
Trackbed layer thickness was reduced due to the Approved geogrid in accordance with Network Rail’s revised (2005) Code of Practice, NP/SP/TRK/9093. New cess drainage was also an important feature of the works.
TECHNICAL PROJECT DESCRIPTION

The line between Derby and Proof House (Birmingham) runs over extensive Coal Measures. Ground investigation and desk study revealed the formation to consist of highly variable stiffness materials, ranging from stiff sandstone to weak fireclay layers. This variability in formation stiffness had led to a history of poor track geometry requiring speed restrictions and frequent cycles of traditional maintenance to the ballast layer.

Consultant Atkins Rail designed a Tensar geogrid reinforced solution, in accordance with client Network Rail’s Code of Practice for Formation Treatments, RT/CE/C/039 (issue 2, Dec 2003) and also specified a double layer of geogrid and a sub-ballast layer to further improve the stiffness of the trackbed over particularly problematic stretches. Tensar geogrids have a long history of successful trackbed performance over poor formation which dates back many years, well into the ‘British Rail’ era.

The ballast and formation was excavated to 400 mm below underside of sleeper. Tensar geogrid was then unrolled onto the formation and a 100 mm thick layer of well graded, ‘Type 1’ sub-ballast was placed on top and compacted. The upper layer of geogrid was then installed and covered with ballast. In areas where a clay formation was exposed the excavation was taken 100mm deeper and additional sub-ballast was placed. Approximately 15,000 m2 of geogrid was installed during the single possession.

CONTRACT DETAILS

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<tr>
<th>Client:</th>
<th>Consultant:</th>
<th>Contractor:</th>
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<td>Network Rail</td>
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<td>Carillion Rail</td>
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