



Tensar[®]

SPECTRA[®]
PAVEMENT OPTIMISATION SYSTEM

A Tensar geocomposite of stabilisation geogrid backed with a non-woven geotextile was laid in a single layer, stabilising the road's sub-base and offering resistance to upwards migration of fines due to groundwater conditions

Not going to pot

Inclusion of a Tensar mechanically stabilised sub-base layer in carriageway reconstruction to reduce future maintenance operations.

A442 Randlay to Stirchley

Roads and Platforms
Pavement Optimisation

📍 UK

CLIENT'S CHALLENGE

After a decade of repairing potholes on the southbound side of the A442 between Randlay and Stirchley in Telford, Telford & Wrekin Council needed a long-term solution to keeping traffic flowing. Along with resurfacing and new drainage, it was decided to completely rebuild 556m in the first lane of a dual carriageway.

TENSAR SOLUTION

Tensar Pavement Optimisation, involving mechanical stabilisation of the reconstructed section's granular sub-base, delivered an alternative pavement design that achieved in-service traffic capacity requirements, while eliminating need for a capping layer that reduced pavement foundation thickness by 45%. A geocomposite of stabilisation geogrid with non-woven geotextile backing was laid in a single layer, providing both mechanical stabilisation and resistance to upwards migration of fines into the pavement structure due to groundwater conditions.

BENEFITS

45% reduction
in pavement foundation
thickness

1300t reduction
in imported fill

50% increased
traffic capacity

REF TEN412



After repairing numerous potholes, which had been appearing with increasing frequency, for a decade, Telford & Wrekin Council wanted a long-term solution.

PROJECT BACKGROUND

Potholes had been appearing with increasing frequency in the southbound carriageways on the A442 in Telford, Shropshire, between the Randlay and Stirchley interchanges. Telford & Wrekin Council had been carrying out repairs for a decade but decided it was no longer viable, or safe, to continue in the same way, so it sought a long-term solution.

Investigations revealed structural issues on the 1.6km stretch of road, requiring resurfacing and drainage replacement, and reconstruction of a 556m long section.

The Council designed the new pavement as Foundation Class 2 using Interim Advice Note (IAN73/06 Rev1), resulting in a 350mm thick sub-base over 250mm capping layer to provide support over the weak ground across the route, which had an average minimum CBR of 2.5% and softer areas with CBRs as low as 1.5%.

However, the council wanted to minimise road closures and approached Tensar for an alternative design; one that would minimise pavement thickness – and hence excavation depth – and so could be built within the limited time available.

Tensar's proposals included an initial assessment of the sub-base with a Tensar stabilisation geogrid included to achieve the target of a foundation class 2 level of support at the top of the unbound granular layer. The whole pavement construction was then assessed as part of Tensar's Spectra Pavement Optimisation system which allows the long term traffic life of the pavement to be assessed, taking into account the effect of the mechanically stabilised sub-base layer and the bound surfacing layers. This fits with the recommendations in CD225: Design for new pavement foundations, which has replaced IAN73 and confirms “mechanical stabilisation with geogrids and/or geotextiles....” as an option for improvement of the sub-grade.

By maintaining the original asphalt surfacing layers, the pavement life was shown to have been extended, offering potential savings to the council's maintenance and repair burden and positively affecting whole life costs for the resulting pavement. The design also delivered savings during construction, cutting the amount of imported fill needed by 1300t, resulting in estimated carbon savings of 60t of CO₂e, using Tensar's Carbon Calculator.

Tensar supplied a geocomposite of stabilisation geogrid backed with a non-woven geotextile providing mechanical stabilisation and offering resistance to upward migrations of fines into the pavement structure due to groundwater conditions, mitigating the risk of damage to the pavement structure. Another advantage of this approach was that the geocomposite could be laid in a single roll, speeding-up construction.

Main contractor:

**Balfour Beatty
Living Spaces**

Client/Designer:

Telford & Wrekin Council

“Tensar's pavement design brought significant time and materials savings to the project, while delivering a long-lasting road surface that will dramatically reduce the maintenance requirements on this important section of the A442.”

Simon Wilkins

Senior Highways Engineer
Telford & Wrekin Council

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