



Tensar[®]



**ROADS AND
PLATFORMS**

Three new settlement tanks were supported by driven precast piles, installed through very weak clays and founded in the underlying chalk bedrock.

Reaping the benefits

Analysis of the full benefits of stabilising geogrid in aggregate, using Tensar's T-Value Method, meant a large working platform could be 350mm thinner, reducing construction time, costs and environmental impact.

CLIENT'S CHALLENGE

A 6,000m² temporary piling platform over very weak ground was needed to build three settlement tanks at Beverley Sewage Treatment Works. The original design called for a 1.25m thick platform incorporating a reinforcement geogrid, requiring large volumes of imported aggregate and excavation and removal of existing soils.

TENSAR SOLUTION

Tensar used its T-Value Method to analyse the full benefits of the stabilising geogrid, rather than a reinforcement solution. This showed that a 350mm thinner platform could be built, with no impact on bearing capacity and load transfer efficiency. This helped cut construction time and costs by nearly a third, and reduced the platform's carbon footprint by 40%.

Beverley Sewage Treatment Works

Temporary working platform

📍 Beverley, UK

BENEFITS

350mm
thinner working platform

30%
cut in construction time and costs

40%
reduction in the platform's carbon footprint



The existing ground was exceptionally low strength as shown from the onsite photos.

PROJECT BACKGROUND

The Beverley Sewage Treatment Works has been in operation since 1893. In 2017, Yorkshire Water announced a £25m project to completely rebuild and modernise the works, bringing them into the 21st century.

Plans included construction of three new Final Settlement Tanks. Ground conditions on site were challenging, with Made Ground and thick deposits of very weak clay and organic material, with undrained shear strengths ranging from less than 5kPa to 10kPa. This meant the 20m diameter tanks had to be supported on precast concrete driven piles, founded in the underlying chalk, between 9m and 14m below ground.

Consultant GHD Livigunn, working for Morgan Sindall Sweco JV, designed the 6,000m² working platform to cater for the BR470 load cases from the piling rig (and support cranes) and the ground conditions. Based on the worst case scenario of the heaviest plant and subgrade undrained shear strength of 4kPa, the platform was to be up to 1.25m thick, comprising 6F2 aggregate with multiple layers of 40kN/m reinforcement geogrid.

Construction of such a substantial platform would require importing large quantities of aggregate and would also have involved excavating into existing Made Ground.

Instead, Tensar proposed using its T-Value Method, which enables the full benefits of stabilising geogrids in granular platforms to be analysed, to assess whether a thinner platform stabilised with geogrid could be used, without impacting on bearing capacity and load transfer efficiency. Analysis showed a stabilised platform could be 350mm thinner and that excavation depth could also be reduced by 350mm, saving 30% on project time and cost, as well as delivering a 40% carbon saving.

Main contractor:

Morgan Sindall Sweco JV

Consultant:

GHD Livigunn

Client:

Yorkshire Water

“Tensar’s T-Value Method enabled us to reduce the thickness of the working platform significantly, without impacting performance.”

Kathryn Tomlinson

Principal Geotechnical Design Engineer, Morgan Sindall Engineering Solutions

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