

Left: Typical ground condition, alluvial crust overlying very soft clay and peat



Right: Tensor TriAx geogrid placed on formation in lieu of ground replacement

BENEFITS TO CLIENT

Revised foundation treatment brings cost and environmental savings.

THE PROBLEM

The A1073 project created 22km of new highway in the Fens of East Anglia. More than half of the route had founding soils of less than 50kPa undrained shear strength. Ordinarily, the HA specification would have required a minimum of 500mm ground replacement across the full width of the carriageway. This would have generated serious environmental, cost and contractor's programme issues. Chemical stabilisation was not a viable solution due to the variability of the founding soils over the length of the project. Ground replacement was not possible as site investigation identified that the lower founding soils had strengths as low as 5kPa.

THE SOLUTION

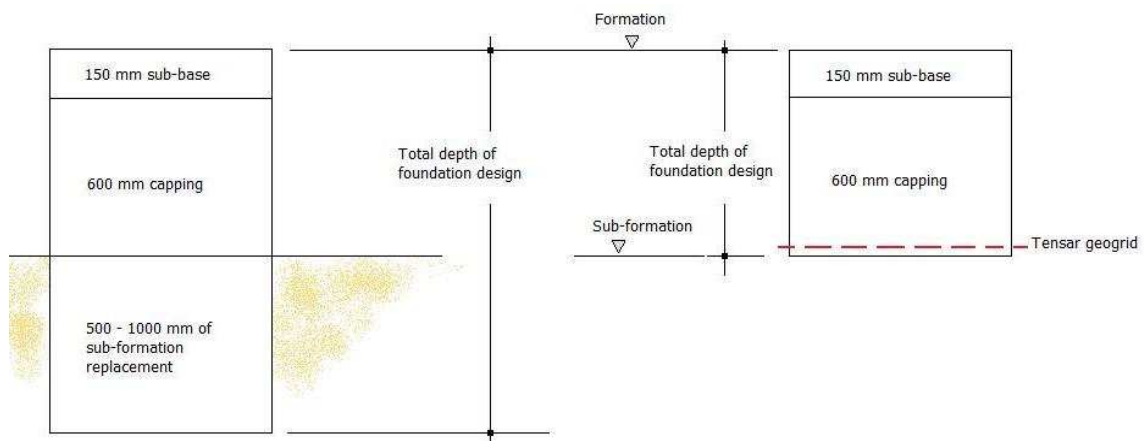
As a Value Engineering alternative to sub-formation replacement, for when the project encountered weak ground, a mechanically stabilised layer comprising Tensor TriAx™ geogrid and local fill were used to create an embankment foundation placed directly on the formation. This saved between 500 and 1000mm of sub-formation replacement.

PROJECT DESCRIPTION

Construction of the new A1073, a strategic route between Spalding and Peterborough was an essential road safety improvement. The old A1073 was a narrow and winding single carriageway carrying a high proportion of heavy goods vehicles and farm traffic. Lincolnshire County Council's Senior Project Leader, Lee Rowley says, "maintenance has been difficult because the old road is on poor ground and we were forever repairing it and road closures caused everyone big problems."

Ground levels along the new route are typically between 1m and 2m above sea level. This is an area known for its high water table and has a history of ground movement due to water level variations in moisture susceptible soils. Investigations by Lincolnshire County Council's laboratory 'LincsLab' had revealed a potentially useful alluvial crust of firm to stiff clay beneath the topsoil and overlying very soft clay and peat layers across the majority of the site.

"In many places we would have had to replace at least 500mm of materials over considerable distances for the full base width of the embankment, so it was more economical to improve the ground", says Morgan Sindall Roads Agent, Paul Brown. The level of performance achieved from the Tensor Mechanically Stabilised Layer aggregates fully met the Client's requirements.



Above: Cross section showing the conforming design and the value engineering alternative.

By using Tensor's Carbon Calculator software, it is estimated that the Tensor solution reduced carbon emissions, in the form of 'greenhouse gases', by between 47% and 54% according to the thickness of the treatment. On a scheme of this size, the carbon saving from this type of solution can amount to 400kgs per linear meter on the highway construction activities.

CONTRACT DETAILS

Consultant:
Jacobs

Contractor:
Morgan Sindall

Client(s):
Lincolnshire County Council/ Highways Agency



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