

# Soil Improvement Technique for Pilot Section as New Railway Project in Libya

**Abstract.** The construction of embankments on soft saturated soils can be a challenge due to the low shear strength and high compressibility of these soils. The application of reinforced and pile-supported embankments to sustain the imposed dead and traffic loads for train speeds of up to 250 km/h is recently growing in Libya. The aim of this study examine the performance of Geogrid-reinforced embankments with Vibro- stone columns as a ground improvement method adopted in "Pilot Section Al Khoms" subject to cyclic loadings that are applied over a specific area of the embankment to improve strength and provide a safe and economical design for the whole coastal railway. The main conclusions from the load plate test indicate that the stringent performance requirements of the new railway project were met. Furthermore, it was observed that with an increasing number of reinforcement Geogrid layers, enormous cycles of loading could be applied without experiencing excessive deformation and an important reduction in the stress and settlement on the subgrade. The results from field experience, show the project was completed on time and the ground improvement method adopted was employed successfully to reduce the costs of construction maintenance of embankments in the high-speed railway project.

**Index Terms.** Geogrid, Settlement, Embankments, Stone Column, Consolidation.