

## International Journal of Geosynthetics and Ground Engineering (2023) 9:85

https://doi.org/10.1007/s40891-023-00506-2

## **ORIGINAL PAPER**

Soil-Reinforcement Interaction of a Geogrid–Geotextile Composite

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Received: 20 July 2023 / Accepted: 3 November 2023

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## Abstract

The use of geosynthetic reinforcement in roadways can provide improved performance as demonstrated in numerous field tests and studies. It is common practice in many regions to install a reinforcement layer (e.g., geogrid) between the subgrade and base course to provide stiffening, reinforcing, and volumetric control, along with a filtration layer (e.g., non-woven geotextile). Alternatively, composite products can combine the functions of geogrids and non-woven geotextiles by bonding two products together into one composite product. There is limited testing information comparing geogrid reinforcement overlying non-woven textiles versus geogrid-geotextile composites. The purpose of the study was to compare the interface performance between separating subgrade and base materials with an assembly of a non-woven geotextile overlaid with a geogrid versus a geogrid–geotextile composite. Large-scale pullout tests were performed to measure the geosynthetic–geosynthetic interaction between a geogrid and non-woven geotextile. Large-scale direct shear tests were performed to measure the soil-geosynthetic interaction of the geogrid-geotextile composite and representative subgrade and base course soil. It was found that the geosynthetic-geosynthetic interface had lower shear strength than the soil-geosynthetic interface. This suggests that the use of a geogrid-geotextile composite can potentially improve soil reinforcement compared to layering a geogrid on a separate non-woven geotextile by eliminating the critical geosynthetic–geosynthetic shear plane.

**Keywords Geosynthetics**  $\cdot$  Pullout test  $\cdot$  Direct shear test  $\cdot$  Soil–geosynthetic interaction  $\cdot$  Geosynthetic–geosynthetic interaction

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