Claims of equivalency don't hold up to scrutiny.

Haul Road Geogrid Test

Southern United States

Tensar®
A Division of CMC

THE STORY

A large, national General Contractor was constructing haul roads to support a large industrial project. To reduce aggregate thickness and minimise maintenance the project team incorporated Tensar InterAx geogrid into the road design. The performance of a road stabilised with Tensar InterAx is quantified with published road design approaches, calibrated to the InterAx geogrid with full-scale, in-ground testing and empirical validation. Prior to construction, the contractor was approached by another geogrid manufacturer with claims that their high-strength biaxial geogrids, (38x40 kN/m and 31x32 kN/m ultimate tensile strength) with a nonwoven fabric attached, could provide the same performance as InterAx at a lower price. Their documents suggest performance between different types of geogrids is based solely on material properties, such as tensile strength and stiffness, and because the biaxial geogrids have higher tensile strength and stiffness than the InterAx geogrid, the biaxial geogrids would perform similar or better in the same design. The contractor decided to stage a side-by-side in-ground test to compare performance of the different products, under comparable subgrade conditions, aggregate fill thickness, construction practices, and traffic loading.

THE TEST

Before the installation began, around 35mm of rain fell on the site during a thunderstorm. The next day, excavation and dewatering of the site took place before the installation of the three geogrids and placement of a layer of "100mm down" dense graded aggregate (DGA) fill over the geogrids. A week later, they placed a further layer of "37.5mm down" DGA and then static rolled the sections. The three completed test sections were all trafficked 50 times by the same fully loaded dump truck. Each time, the truck made a straight pass over the entire 90m of test sections, then exited the haul road, looped around, and drove over the test sections again the same way. After trafficking was complete, the contractor identified and measured the worst rutting in each 30m test section.

PROJECT DETAILS

Installed by:
General Contractor

Installation:
May 2024

Products compared:
Tensar InterAx Geogrid
High-Strength Biaxial Geogrid Composites

Difficult installation of biaxial geogrid with poorly laminated fabric requiring extra hands to install

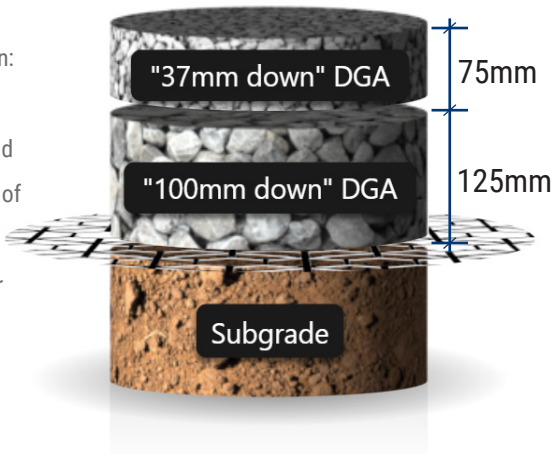
Trafficking truck during installation of well graded granular fill

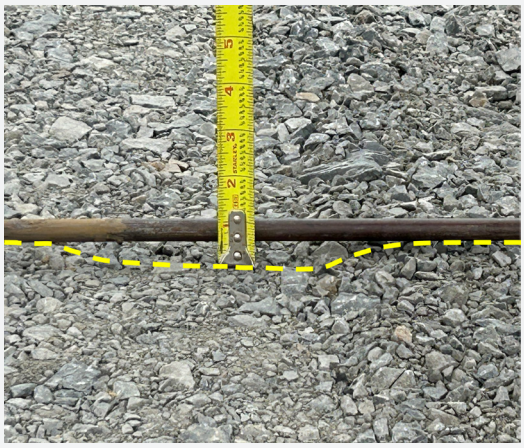
THE RESULTS

The rutting measurements taken after trafficking the sections were significantly less for the section built with Tensar InterAx than for either of the two sections built with biaxial geogrids. In the first section, built with InterAx underneath, 50 passes with the loaded dump truck only produced around 12mm of rutting. The second and third sections, on the other hand, constructed using the biaxial geogrids, rutted by around 60mm and 100mm, respectively. Rutting measurements were representative of the average rutting experienced in each test section.

Test Section Results			
Geosynthetic Product	Tensar InterAx	Biaxial Grid 1	Biaxial Grid 2
Measured Deformation (Surface Rut Depth)	12mm	60mm	100mm
Geosynthetic Type	multi-axial, multi-aperture geogrid	biaxial geogrid/fabric composite	
Ultimate Tensile Strength	N/A	38x40 kN/m	31x32 kN/m

Each of the three constructed test sections were built to the same design: a geogrid product covered first with 125mm of the "100mm down" DGA and then topped with an additional 75mm of the "37.5mm down" DGA. The cross-section to the right depicts the Tensar InterAx geogrid at the bottom, but all three sections were built according to this design.





Section 1 - Tensar InterAx: 12mm rut

Section 2 - Biaxial Grid 1: 60mm rut

Section 3 - Biaxial Grid 2: 100mm rut

CONCLUSIONS

- **The Tensar InterAx section outperformed both biaxial geogrid sections.**
- **Geogrid material properties, such as tensile strength and stiffness, are not predictors of performance.**

Tensile strength is not an indicator of performance in soil stabilisation projects. Full-scale in-ground testing is the most reliable method for quantifying in-ground performance, especially when comparing products with differing geometries, materials, and other features. Scan this QR code to learn more about how to compare performance in construction.

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