

# Inspired by tortoise & Taj Mahal, IIT-I develops two revolutionary geogrids

**Our Staff Reporter**

INDORE

In what is considered as a major breakthrough in the field of sustainable civil engineering, Indian Institute of Technology Indore researchers have developed two new geogrids that could help to construct pavements on soft soils.

"These two innovations drew inspiration from nature, particularly from the Indian star tortoise and the architecture of the Taj Mahal," said Dr Baadiga Ramu, who spearheaded the research team comprising BS Praveen (doctoral scholar) and P Sai Meghana (UG scholar) from the



Department of Civil Engineering and Prof Umashankar Balunaini from IIT Hyderabad.

Geogrids are becoming crucial in sustainable engineering due to their ability to reinforce soils and reduce the environmental impact of construction.

By improving the durability and efficiency of roads, embankments, landslides, and other structures, geogrids help

reduce the need for thick layers of aggregate or soil, making projects more resource efficient. Their role in load distribution minimizes localized failures, reduces pavement deformation, and enhances long-term stability, contributing significantly to reducing the carbon footprint of construction by lowering material use and energy consumption.

IIT Indore director Prof Suhas Joshi said, "India, with its extensive road network, faces significant challenges in managing massive volumes of crushed stone aggregates required for such infrastructure.

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## Inspired by tortoise &...

This technological development is in alignment with the nation's commitment to the UN Sustainable Development Goals, particularly those focused on innovative, resilient, and sustainable infrastructure. This new technology addresses climate change, resource scarcity, and waste management issues."

Baadiga said, "We have developed two new geogrids designed to surpass the existing geogrids in the market in terms of superior strength. These geogrids belong to the geosynthetics family, including geotextiles, geocells, and others. These new designs were developed in Dr Ramu's & Prof Umashankar's research laboratory and have been filed for patent and industrial design registration in India." Umashankar said, "The geosynthetic industry currently offers a range of geogrids, including uniaxial, biaxial, triaxial, and multi-axial designs, with some even featuring hexagonal shapes from various manufacturers. Ongoing research is focused on developing superior geogrids that outperform existing ones in terms of strength, durability, and overall performance. The current innovations, namely Multiaxial Diamond Anchored Octagonal Geogrid (MDAOG) and Multiaxial Concentric Octagonal Geogrid (MCOG) are recent breakthroughs designed to push the boundaries of geogrid technology and set new standards in the industry."

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