

IIT-I develops innovative geogrid designs to mitigate climate impacts

TIMES NEWS NETWORK

Indore: The Indian Institute of Technology (IIT) Indore in collaboration with IIT-Hyderabad, has developed two geogrid designs to help construct pavements on soft soil and eco-friendly infrastructures. The finding aims to reduce pavement deformation and enhance the long-term stability of structures.

"Geogrids have become 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," IIT-I issued a statement on Tuesday.

The development of geogrid designs is led by Dr Baadiga Ramu and members of his research team, BS Praveen

Geogrids help mitigate climate impacts like flooding and rising sea levels by stabilising soils, preventing erosion, and enhancing infrastructure resilience

and P Sai Meghana, from the department of civil engineering at IIT Indore, and Professor Umashankar Balunaini from IIT Hyderabad, department of civil engineering.

Dr 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 two innovations drew inspiration from nature, particularly from the Indian star tortoise and the architecture of the Taj Mahal. These new de-

signs have been filed for patent and industrial design registration in India."

Geogrids help mitigate climate impacts like flooding and rising sea levels by stabilising soils, preventing erosion, and enhancing infrastructure resilience.

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

Professor Balunaini said, "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."

"MDAOG and MCOG geogrids are expected to have diverse civil engineering applications, including the construction of flexible pavements, especially highways. They also enhance airport runways and railway track beds, provide support in tunnel construction and underground mining, and reinforce foundations, embankments, and slopes. Additionally, they are vital in retaining walls, bridge abutments, riverbank protection, and soil erosion control, making them crucial for sustainable civil engineering projects," the statement read.