

TriAx®

Reduce Access Road and Crane Pad Costs by 50%

Using Tensar® TriAx® Geogrids In Wind Farm Applications

THE CHALLENGE

Wind farms are traditionally found in remote locations. In many cases, the underlying soil conditions are unfavorable, characterized by soft clay, silt or peat with high groundwater tables.

This presents a particular challenge to the contractor when constructing access roads with heavy vehicle traffic. An even greater test occurs in areas where the wind turbines are located. Heavy lifting equipment, required to position the turbines, exerts high pressures on the underlying soft subgrade.

THE TRIAX ADVANTAGE

By incorporating Tensar TriAx Geogrids, a mechanically stabilized layer is created for the haul/access roads and working areas. Construction savings of up to 50% can be realized in the amount of aggregate required. This results in less excavated material needed to be taken away from the site, and less aggregate needed to be imported, placed and compacted.

- ▶ **Less Aggregate:** The latest Giroud-Han design methodology has demonstrated that the required aggregate thickness can be reduced by up to 60% for roads reinforced with Tensar TriAx Geogrids with no loss in performance.
- ▶ **Increased Speed of Construction:** The installation process for geogrids is extremely straightforward. Using less aggregate leads to quicker installation when compared to other solutions that use conventional soil stabilization techniques.
- ▶ **Avoid Over-excavation:** Traditional stabilization often involves over-excavation and disposal of the uppermost subgrade soils.



- ▶ **Eliminate Uncertainties Associated with Chemical Stabilization:** Apart from the obvious environmental concerns, chemical treatment of the subgrade requires that optimum temperatures and dry weather conditions be met. This can lead to delays in the construction process.
- ▶ **Lower Costs:** Using less aggregate with an increased speed of construction yields significant cost savings on wind farm projects. These cost savings increase with greater traffic loads and weaker subsoil conditions.



MAXIMIZE TIME AND COST SAVINGS WITH SPECTRAPAVE™ SOFTWARE

The Giroud-Han design method was published in the August 2004 edition of the ASCE Geotechnical Journal. The paper reveals the most significant advancement in the design of geosynthetic-reinforced roads within the last 10 years. Tensar developed SpectraPave Software in order to offer *Engineered Solutions* compliant with the latest design methodology.

For the wind farm developer, SpectraPave Software allows the removal of uncertainties associated with the cost and reliability of access road construction. This is particularly important when dealing with heavy loads and weak soils, as it also allows the developer to minimize the cost of these components.

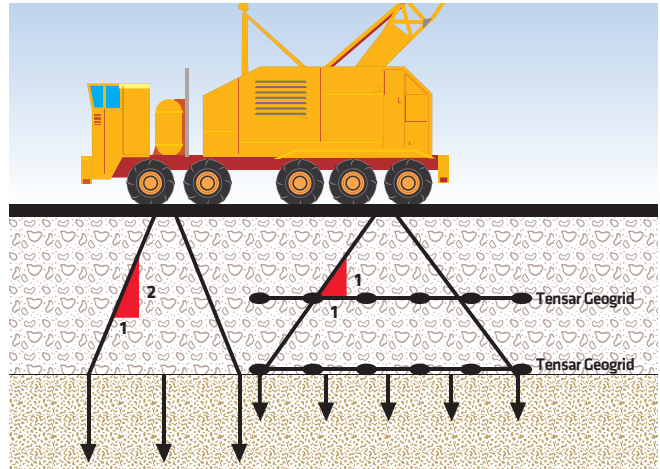
SpectraPave Software is available free of charge. To receive your free copy and software demonstration, please visit our website:

www.info.tensarcorp.com/tensar-spectrapave

HEAVILY LOADED AREAS

The locations where turbine components are unloaded and lifted into position often present the greatest challenge to avoiding subgrade failure. In these areas, multiple layers of Tensar TriAx Geogrids can be used to strengthen the aggregate section.

The stiffened aggregate results in an enhanced load distribution beneath the large static and dynamic loads imposed by the lifting equipment. This increases the factor of safety against a bearing capacity failure in the subgrade.



Wider load spread results in less stress on the subgrade.

MAPLE RIDGE WIND FARM, LOWVILLE, NEW YORK

The Challenge: Over 23 miles of access roads were required to build the 120 wind turbines included in Phase I of this wind farm project. Unfavorable ground conditions were encountered and the initial solution using a geotextile had proven unsuccessful. The contractor needed a fast solution.

The Solution: By using SpectraPave Software, Tensar's local representative was able to offer an engineered, cost-effective solution to the soft ground problems within 24 hours of visiting the site in response to the contractor's "SOS" call. In total, 453,000 square yards of Tensar Geogrid have been used successfully on this site.



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