

Tensar's alternative design provides substantial savings for wind farm access roads.



Hagshaw Hill Wind Farm

Lanarkshire, Scotland

Tensar's innovative one-layer geogrid design helped support access roads on a site with low strength sub-grade soil and deep areas of peat. The use of one-layer not only meant construction time was halved, but there was also a 34% reduction in aggregate thickness, delivering significant cost savings.

CLIENT'S CHALLENGE

The contractor at Hagshaw Wind Farm, Wills Brothers needed to construct permanent unpaved access roads on a site which had low strength subgrade soils and areas of deep peat. They were familiar with geogrids and obtained a design from a supplier. This design required two layers of geogrid. They needed a lower cost solution and a product that would enable use of the available coarse aggregate.

TENSAR SOLUTION

Tensar provided a solution which required just one layer of Tensar H-Series geogrid and a reduced aggregate layer thickness, compared to two geogrid layers in the competition solution. Construction time was halved and, combined with need for less aggregate, significant cost savings were delivered across the project. Tensar's design used the LAAMS method, which is a powerful and scientifically rigorous design approach, derived from fundamental and well-established engineering principles.

B E N E F I T S

- **Construction time halved**
- **34% reduction** in aggregate thickness.
- **Single-layer Tensar geogrid** savings on initial two-layer project costs.
- **Tensar geogrid** aperture is compatible with available coarsely graded aggregate.

Tensar®

A Division of CMC

PROJECT DETAILS

Application

**Unpaved Roads
Subgrade Stabilisation | No. 517**

Constructed in
2024

Client

Scottish Power Renewables

Contractor

Wills Brothers

PROJECT BACKGROUND

Located near Douglas in South Lanarkshire and operational since 1995, ScottishPower Renewables' Hagshaw Hill windfarm in South Lanarkshire was at the forefront of wind energy production in Scotland, generating more than 895MWh over its 30-year lifespan. The 26 original turbines were repowered, but have now been decommissioned and have been replaced by 14 new turbines which a much higher generating capacity. The windfarm is now capable of producing around five times the amount of clean, green energy than before, from just over half the number of turbines.

A network of access roads and working platforms was required for the construction phase to enable transport of the heavy turbines and construction plant. These unsurfaced roads would need to be permanent to provide service access. The ground conditions included areas of soft clay and deep peat, which would need 'floating road' design.

The contractor was already familiar with the benefits of geogrids for stabilised road construction. They had used various geogrid types in the past and were sceptical about Tensar geogrids due to their relatively higher unit cost. They were about to proceed with access road construction based on a design from a competitor geogrid supplier using the Giroud-Han (G-H) method. This required two layers of a competitor geogrid.

Tensar offered an alternative design based on the Lees Approach to Applied Mechanical Stabilisation (LAAMS) method and use of a single layer of Tensar H Series geogrid. This required 34% less aggregate thickness compared to the competitor design – a major reduction in carbon emissions and cost. Also, by selecting a larger-ap eogrid, the Tensar solution was compatible with the available coarse graded aggregate preferred by the contractor. The Tensar solution was adopted, and the contractor achieved major savings in cost and reduced the construction time by almost half.



Tensar HX geogrid is designed to work well with a broad range of aggregates and granular materials that can offer additional savings through lower cost aggregate options.

Comparison of cross section for non-stabilised vs Tensar geogrid solution

Non-stabilised



Stabilised with
Tensar H-Series geogrid



let us help you with your next challenge: tensar.co.uk email: tensarinfo-uk@cmc.com



We're CMC. You'll find our products strengthening and reinforcing the infrastructure nearly everywhere on the planet – in sports stadiums and public buildings as well as highways, bridges, railways and other structures. To serve this global market, CMC maintains facilities across the United States, Europe and Asia. These sites include everything from local recycling centers, steel mini-mills and micro-mills to large-scale fabrication centers, heat-treating facilities as well as other operations. **cmc.com** ©CMC 2024