Designing Floating Access Roads for Douglas West Wind Farm



Douglas West Wind Farm Extension (78MW)

South Lanakshire, Scotland

CLIENT'S CHALLENGE

The Douglas West Wind Farm Extension required the construction of a 6.5km access road across areas underlain by weak peat and clay subgrades. With in-situ CBR as low as 0.5%, the project demanded a solution capable of accommodating heavy construction traffic while maintaining pavement stability and minimising aggregate requirements.

TENSAR SOLUTION

Tensar designed a mechanically stabilised layer (MSL) using Tensar InterAx® geogrids designed in accordance with the LAAMS methodology, which is available through the Unpaved Road module within Tensar+™ design software. The stabilised haul road enhanced load distribution and aggregate confinement within the road construction, enabling haul roads to be constructed over very weak peat and clay subgrades using locally sourced Class 6F5 fill material beneath a Type 1 granular running surface. A number of alternative haul roads designs were assessed, incorporating either single or double-layer InterAx® geogrid configurations, allowing the client to optimise the balance between construction cost, haul road performance, and material volumes. The stabilised road sections provided improved bearing capacity, increased resistance to rutting and deformation, and reduced aggregate thickness requirements when compared with conventional solutions. The final design was engineered to support both the intensive construction-phase traffic loading and the long-term operational requirements of the wind farm road network, whilst delivering a cost-effective and sustainable solution for the challenging ground conditions encountered on site.

PROJECT DETAILS

Application
Subgrade Stabilisation | No. 580

Constructed in
2025

Client
3R Energy in partnership with Scottish Power Renewables (via the project company Douglas West Extension)

Contractor
AE Yates Ltd

BENEFITS

- **Significant estimated savings of** 84% reduction in construction costs, 58% reduction in programme time and 58% reduction in carbon emissions.
- **Enabled the construction of access roads** across very weak peat and clay subgrades, including areas with extremely low bearing capacity
- **Reduced aggregate requirements** through the use of Tensar MSL, lowering material demand and haulage
- **Improved load distribution and road performance** under heavy construction and turbine delivery traffic
- **Delivered stable floating road sections** and mitigated differential settlement risks across challenging ground conditions
- **Provided multiple design options,** giving the client greater flexibility to optimise the balance between aggregate and geogrid costs.

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Solid Support for Douglas West Wind Farm

Douglas West Wind Farm Extension (78MW)

South Lanakshire, Scotland

CLIENT'S CHALLENGE

The project required crane hardstandings capable of supporting outrigger pressures of 250 kPa over a loaded area of 2.5m × 6.0m. The area included twelve hardstanding locations and totalled around 16,800 m². The construction traffic was up to 9,000 ESALs, in addition to in-service traffic of approximately 300 ESALs.

TENSAR SOLUTION

Tensar proposed the use of a Mechanically Stabilised Layer (MSL) incorporating Tensar InterAx® geogrid technology to improve load distribution and enhance platform performance. The design was developed using Tensar's T-Value design methodology, targeting a factor of safety of 2 against shear failure at formation level. Two alternative platform configurations were developed for the client to enable them to balance between platform thickness and geogrid usage. The option chosen was the simplified construction approach, which utilised a single layer of geogrid instead of Tensar InterAx geogrid, providing a reduction in thickness and a technically robust solution.

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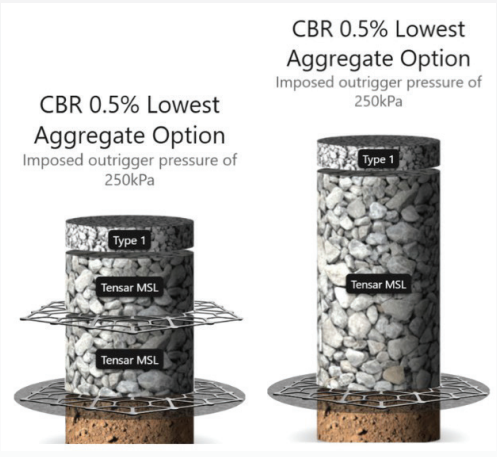
PROJECT DETAILS

Application
Working Platforms | No. 580

Constructed in
2025

Client
3R Energy in partnership with Scottish Power Renewables (via the project company Douglas West Extension)

Contractor
AE Yates Ltd



Cross section diagram showing two alternative platform configurations offered.

BENEFITS

- **Significant estimated savings of** 69% reduction in construction costs, 45% reduction in programme time and 45% reduction in carbon emissions
- **Reduced aggregate requirements** through improved load transfer and confinement
- **Enhanced bearing capacity** for heavy crane outriggers and construction traffic
- **Improved constructability** on challenging ground conditions following peat excavation
- **Flexible design options** allowing the contractor to balance platform thickness and geogrid volume
- **A technically robust solution** developed specifically for large-scale renewable energy infrastructure

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