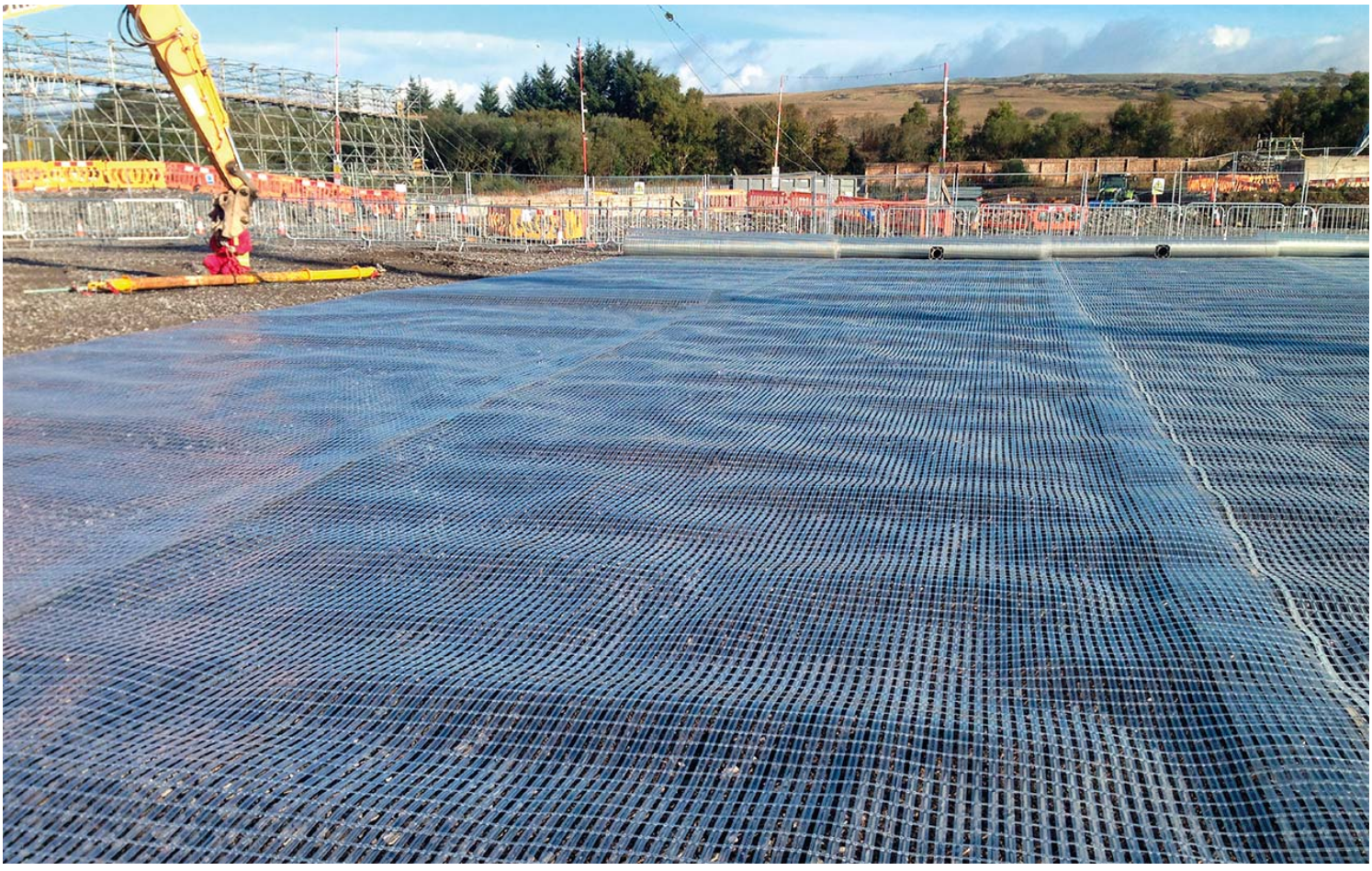
Secugrid® - Rhigos Electricity Substation - UK

Geogrid-reinforced platform

- **Project Name**
  Rhigos Electricity Substation, Hirwaun, South Wales, UK
- **Client**
  National Grid, UK
- **Supplier**
  Churngold Construction Ltd, UK
- **Consultant**
  Jacobs Solutions, UK
- **Product**
  Secugrid® 400/40 R6
  Secugrid® 30/30 Q1



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At the 7.8 hectare site located on the Hirwaun Industrial Estate, the construction of a 400kV substation was required to connect a new 76 turbine, 228MW wind farm development to the National Grid. The wind farm, approximately 4km to the south at Pen-y-Cymoedd, will be the largest onshore wind farm in England and Wales when it enters operation.

Challenge

In such substation construction projects, it is crucial to have stable foundations with sufficient bearing capacity to cope with large and heavy electrical equipment – the Rhigos substation will house two transformers, each weighing in at around 125,000 tonnes. As well as designing a foundation that would facilitate extremely high loads, engineers must also ensure that consolidation settlement is avoided.

Solution

Design consultants Jacobs, assisted by Naue design engineers, worked on the design of a geogrid load transfer platform which would distribute loads efficiently across a series of vertically driven concrete piles, and fully satisfy the requirement for very small allowable defor-mations. A matrix of concrete piles, spaced 2.5 metres apart, were driven over an area of 20,000m2, and two layers of Secugrid® geogrid 400/40 R6 were installed to spread the load over the piled foundation. High strength Secugrid® has a tensile strength in length-direction of 400 kN/m, and in cross-direction of 40 kN/m. Secugrid® geogrids feature high strength monolithic flat polymer bars and welded junctions; they resist surface tensile force loading, with very low elongations, resulting in immediate force connection and interlocking with fill material without primary deformation. Naue also supplied the substation site with 20,000m2 of its standard Secugrid® 30/30 Q1 for use as a geogrid piling mat to provide a safe working platform for the site's heavy piling rigs. All materials were delivered to site in single full truck quantities; complying with the main contractor's delivery schedule and specification.

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