

Pioneering port development with geogrids and geocomposites

Stabilisation of soft subsoils

- **Project Name**
Polder Brest, Bretagne, France
- **Project owner**
Région Bretagne, France
- **Consultant**
DEME Group, Belgium
- **Products**
Combigrid® 80/80 Q6 R 156 C
Combigrid® 80/80 Q1 GRK 4 C
Secugrid® 60/60 Q1
Secugrid® 120/40 R6





Pic. 1: Secugrid® installation, covered with sand



Pic. 2: Aerial view of Secugrid® installation

The port of Brest is undergoing a major expansion, co-financed by the European Union and the Region of Bretagne. New industrial areas are being developed to support the growing marine renewable energy industry. As part of this expansion, a 10-hectare polder is being created using dredged materials. The polder will serve as a storage and handling area for ongoing port development.

Challenges of building on soft sediments

The project's main goal was to construct a quay, breakwater, and a platform with sufficient bearing capacity for storage of heavy offshore wind turbine foundations. However, the soft marine sediments in the area posed a significant challenge, as they lacked the shear resistance to support the required loads.

Smart use of dredged material

Around 1 million m³ of soft marine sediment was dredged from the port of Brest and used to backfill the new polder. This ecological approach ensured minimal waste and supported the sustainable development of the region's renewable energy projects.

High-tech solutions for ground stabilisation

To stabilise and reinforce the soft ground, the consultant proposed using Naue Combigrid® and Secugrid®. Combigrid®, a geocomposite made of stretched monolithic flat bars with welded junctions and a mechanically bonded and calendered geotextile welded within the geogrid structure, was used as the first layer. A second layer of Secugrid® was installed at the centre of the base course. The geogrids provided the necessary tensile strength and stability to support the platform, preventing deformation and ensuring long-term performance.

Ensuring stability and durability

Naue Combigrid® provided separation between the fill material and the in-situ fine grained subgrade soil, while its geogrid component enhanced the shear resistance of the unbound base course material. This ensured improved load distribution, reducing the risk of differential settlement. Combigrid® was installed at seabed level and covered with 40cm of sand fill material. Secugrid® was installed on top of the compacted sand layer to achieve the necessary factor of safety for the bund's stability.

Results and impact

With approximately 150,000 m² of Combigrid® and Secugrid® supplied, Naue's products played a crucial role in ensuring the successful completion of this innovative project. The use of advanced geosynthetics allowed the construction team to stabilise the challenging soft ground conditions, paving the way for future renewable energy infrastructure at the port.