

Smart from the ground up - Geosynthetics for energy & water control

Base course reinforcement

- **Project name**
Uskmouth Power Station, South Wales, UK
- **Client**
Uskmouth Energy Storage Ltd, UK
- **Designer/consultant**
Alistair Burroughs Design Partnership Ltd, UK
- **Contractor**
Jones Bros Civil Engineering UK
- **Products**
Secugrid® 40/40 Q6
Secumat® 401 G4
Bentofix® NSP 5300
Carbofol® 1mm
Secutex® R 301
Secutex® R 401





Fig. 1: Installation of Bentofix®



Fig. 2: Installation of impermeable isolatable cells with Carbofol® and Secutex®

A new chapter for a historic site - from coal yard to clean energy hub

In the transition to renewable energy, battery storage systems are key to balancing supply fluctuations. In Newport, South Wales, a brownfield site - once home to two coal-fired power stations - is being transformed into a sustainable energy park. At the former coal yard of Uskmouth B, decommissioned in 2017, Uskmouth Energy Storage Ltd is developing a 230MW battery energy storage system (BESS). The facility will utilise over 100 battery units to provide essential grid-balancing services by storing excess renewable power and discharging it during peak demand.

High-tech infrastructure meets tough ground conditions and tidal threats

Located near the River Usk estuary, the site is exposed to tidal flood risk. To protect the battery units, ground levels needed to be raised significantly. The project also demanded sustainable stormwater management and ecological design, including the construction of a retention pond. Burroughs engineers called for a robust foundation platform to withstand loading from heavy equipment and the battery containers, as well as steep slope reinforcement in space-constrained areas. Emergency runoff containment was another requirement, along with a durable lining solution for the new pond.

Engineered strength for infrastructure resilience

To raise the platform by approximately 2m, a well-graded Class 1A aggregate was placed over a cut-and-filled base. Naue's Secugrid® 40/40 Q6 reinforced the platform edges, especially where 1:1 slope steepness was required. Around 8,000m² of this PET geogrid was installed. Secugrid® is known for its high stiffness, low creep, and effective force transfer through interlock and friction - ensuring a stable base for the battery storage facility.

To prevent erosion on steep slopes, over 1,000m² of Secumat® 401 G4 was installed. This UV-stabilised erosion control mat combines a structured, root-permeable matrix with a stabilising underside, ideal for vegetated slopes.

For firewater containment, impermeable isolatable cells were constructed within the platform using over 20,000m² of Carbofol® 1mm HDPE-geomembrane, protected above and below by Secutex® R401 and R301 PP-nonwoven geotextiles. Naue Carbofol® provides excellent chemical resistance and weldability, while Secutex® safeguards against puncture and installation damage.

The nearby stormwater retention pond was lined with Bentofix® NSP 5300, a geosynthetic clay liner (GCL) combining geotextiles and high-swelling sodium bentonite. Covering around 4,000m², the liner ensured watertightness with minimal thickness, avoiding the need for clay sourcing. This reduced transport emissions and local traffic while supporting ecological aims - the pond is designed to attract endangered water voles and promote biodiversity.

Powering the energy transition - safely, sustainably, smartly

From slope reinforcement to hydraulic sealing, Naue's geosynthetic systems delivered a high-performance, sustainable foundation for this next-generation battery storage facility. Jake White, Sales Manager for Southern England & Wales at Naue, summarised: "Naue's solutions at Uskmouth helped deliver the project's engineering goals - while keeping environmental impact to a minimum."