

# Bentofix® Secutex®

Sealing system for a new leisure lake

- **Project Name**  
Thornwick Bay Holiday Village  
Flamborough, East Riding of Yorkshire , UK
- **Client**  
Haven Leisure, Yorkshire, UK
- **Contractor**  
CLS Civil Engineering, Brigg, UK
- **Installer**  
AJS Lining, Abergele, UK / CLS Civil Engineering, Brigg, UK
- **Product**  
Bentofix® NSP 4900  
Secutex® R 301 C





Probably best known for its towering chalk cliffs and huge seabird colony, Flamborough Headland is also the location of one of four Haven holiday destinations on the Yorkshire coast.

Since acquiring the site back in 2015, Haven has invested heavily in the refurbishment and expansion of the holiday park, and construction of the new lake, covering almost 2 hectares, is just one element of a 10-year masterplan for the Thornwick site and part of a multi-million-pound investment to modernise and improve the site's overall appearance.

## Challenge

Initial excavations got underway in late 2019, with the project expected to be completed over the winter season, ready for holidaymakers arriving in the spring. In November 2019, however, torrential storms and flooding affected the East Yorkshire area particularly badly, and excavation works turned the site into a quagmire – more mud bath than leisure lake – making the task of constructing an effective containment layer, to hold millions of litres of water, exceptionally challenging.

## Solution

Topsoil was removed from an area of around 35,000m<sup>2</sup> prior to excavating around 70,000m<sup>3</sup> to create the new lake before the exceptional weather conditions impacted progress. CLS Civil Engineering approached Naue Geosynthetics for alternative options to the specified sealing system, which had called for the installation of a protective geotextile layer, followed by an EPDM membrane, then a second layer of geotextile protection.

“Naue’s Bentofix® NSP 4900 Geosynthetic Clay Liner (GCL) was the obvious choice for this type of application”, explains Infrastructure Manager, Steven Airey. “But, given the weather conditions at the time of installation, any other method of lining the new lake would have been extremely problematic for the contractor.” With years of experience delivering similar projects, ASJ Lining’s installation team also gave its seal of approval to Naue’s solution and, despite the demanding wet and muddy conditions at the site, the ‘self-healing’ properties of Bentofix® and its general ease of installation, made it the ideal material in the circumstances.

25,000m<sup>2</sup> of Naue’s Bentofix® GCL was installed to line the new leisure lake constructed at Thornwick Bay; although the tranquil view pictured above is a far cry from the heavy muddy landscape that faced installation experts from ASJ Lining Technology.

Bentofix® is a needle-punched, reinforced composite that combines two durable, geotextile outer layers with a uniform core of high-swelling powder sodium bentonite clay. This forms a uniform, multi-directional, shear-resistant hydraulic barrier with self-sealing and re-healing characteristics.

Supplied on 5.00m wide rolls, the Bentofix® GCL is simply rolled out on-site using a ‘lap and lay’ technique – additional Bentonite powder impregnated into a 50cm wide strip down the length of the GCL ensures the integrity of joins with a 30cm overlap and provides for a most time and cost-effective installation progress.

Although Bentofix® requires no additional protection when the particle size of any cover layer is less than 25mm, CLS chose to install a 300g/m<sup>2</sup> geotextile layer to protect against any possible damage during installation. Naue’s Secutex® R 301 C was selected for the task.

Secutex® is a nonwoven geotextile with high elongation capacity and excellent resistance to damage. When covered with coarse material, the nonwoven fibres are reoriented around the stones, preventing damage to the geotextile’s structure, and providing protection for the Bentofix® GCL.

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