Bentofix® GCL selected for Dalton Lane flood defences

Cod Beck is a river in North Yorkshire with a catchment area of over 80 square miles, extending from above Cod Beck Reservoir on the edge of the North York Moors, running south through Thirsk, before skirting around the village of Dalton and Dalton Industrial Estate, and finally joining the River Swale just 500 metres south west of the Estate.

Cod Beck has a long history of flooding; the river depth typically ranges between 0.57 and 1.78 metres at Dalton, but above this level the surrounding highway is subject to flooding, and floodwaters frequently lead to the closure of Dalton Lane – the main access route to Dalton Industrial Estate.

The Estate, which is home to around 30 businesses, employing in the region of 850 people, derives economic and commercial benefits from its connection to the A168, which joins the A1(M) at Dishforth and links to the A19 at Thirsk. In addition, the East Coast Main Line provides a direct rail link from Thirsk to London.

CASE STUDY

Project Name:	**Dalton Lane Highway and Bridge Improvement**
Date:	**June 2017 – October 2018**
Client:	**North Yorkshire County Council**
Contractor/Installer:	**Coffey Group**
Designer/Consultant:	**Sweco**
Products:	**Bentofix® BFG 5000**

NAUE's Bentofix® BFG 5000 has been employed as a GCL in the construction of flood defences designed to protect a North Yorkshire industrial estate from the effects of perennial flooding of Cod Beck river at Dalton, near Thirsk.

NAUE's BENTOFIX® BFG 5000 provided immediate protection for flood defences being constructed at Dalton Lane, near Thirsk.

The Geosynthetic Clay Lining material was placed directly onto the stepped embankment construction, followed by a covering layer of sand.

The embankments will protect access to Dalton Industrial Estate and provide the new bridge and elevated highway with 1 in 100 year flood protection.

Just 7mm in thickness, Bentofix® BFG 5000 instantly forms a waterproof barrier when hydrated.

Clay was imported for construction of the stepped embankments, but specification of Bentofix® BFG 5000, and its efficacy in the formation of an impervious barrier, minimised the amount of clay required.

The £4.1 million Dalton Lane project, which was the result of a partnership between businesses operating on Dalton Industrial Estate, the York, North Yorkshire and East Riding Enterprise Partnership, North Yorkshire County Council, Hambleton District Council and the Environment Agency, required the realignment of Dalton Lane, and works included the construction of flood protection embankments, a replacement bridge, and a new elevated section of highway; almost 2.5 metres higher than the existing level.

Construction design for the project was undertaken by civil engineering consultants Sweco UK and, based on previous experience with NAUE's geosynthetic clay liners on similar projects, specified Bentofix® BFG 5000 to be used to form an impervious barrier in construction of the steep embankments. Bentofix® BFG 5000 has BBA Certification for waterproofing and methane/radon barrier performance under confining pressure, and is ideally suited to the task at Dalton Lane.

Bentofix® BFG 5000 consists of two polypropylene geotextile layers; one woven and one non-woven layer. Between the two geotextiles is an integral layer of natural sodium bentonite and, in addition, the outer surface of the non-woven geotextile is impregnated with bentonite powder across its entire surface. The layers are mechanically joined by needle-punching the two geotextile layers; effectively pushing the fibres of the non-woven geotextile through the bentonite layer, securing them into the retaining woven layer and encapsulating the sodium bentonite.

NAUE's Bentofix BFG 5000 is robust and resistant to normal site activities and will provide a permanent and effective waterproof barrier for the life of the structure in which it is incorporated. During installation, dropping heavy objects on the geotextile will normally have no damaging effect, yet the material is easily trimmed to shape on site with standard trimming knives. No specialised tools are required for installation and the presence of bentonite powder ensures that any accidental damage or cuts 'self-heal' once the product is hydrated.

Long-established civil engineering and public works contractor Coffey Group, was responsible for construction of the flood embankments and installation of the GCL, and feedback received from Coffey's installation team, during site visits by NAUE's sales engineer Jason Bland, emphasised the product's ease of handling and simplicity of use. Rolls of Bentofix are deployed onsite with the aid of a loader fitted with a spreader bar, and simple overlap joints of approximately 250mm are sufficient to achieve a continuous waterproof seal.

In total, NAUE supplied 8,000m^2 of Bentofix® BFG 5000 for the project; all supplied on standard 40m long, 5m wide rolls.

NAUE GEOSYNTHETICS

NAUE Geosynthetics Ltd.
The Genesis Centre, Unit G14, Birchwood, Warrington WA3 7BH, United Kingdom
Phone: +44 1925 810280 Fax: +44 1925 810284 email: enquiries@naue.co.uk