

Basin Construction

Attenuation Pond, Pozidrain & Trigrid, Forder Valley, Plymouth, UK



CASE STUDY



Project Description

The Forder Valley Link Road scheme is a major highway improvement project to the north of Plymouth. Derriford, on Plymouth's Northern Corridor, is a key economic centre within the city, with major employment sites such as Derriford Hospital, the University of St Mark and St John, and Plymouth Science Park all located in the area. The large junction improvement scheme was commissioned by Plymouth City Council to ease congestion along the Forder Valley Road and to relieve the heavy traffic flows putting strain on the local transport network.

The Challenge

The site features steep local topography to the east, west and south, and is bound by the A386 and Plymouth City Airport. As part of the improvement works, a series of drainage and attenuation ponds were designed to provide stormwater collection and storage following heavy rainfall events and to help prevent flash flooding. There were concerns over a high water table causing potential uplift pressure problems on the pond lining system and it was necessary to find a cost effective and environmentally friendly solution to alleviate the floatation risk. Traditional drainage stone was an option, but would require a greater excavation thickness / depth as well as a protection geotextile to the underside of the Geosynthetic Clay Liner (GCL). This is a costly and carbon intensive option and would reduce the capacity of water storage based on the same depth of dig. Digging deeper was not considered to be an option due to the additional amount of excavated soil to be disposed of.

Project Information

Client	Plymouth City Council
Contractor	Balfour Beatty
Products	ABG Pozidrain 7S250D/NW8 Trigrid EX30/30
Quantity	6,600m ²
Benefits	<ul style="list-style-type: none">• Reduced depth of dig and spoil disposal required• High flow capacity provided in a 6mm layer to alleviate uplift pressure• Carbon saving alternative to crushed stone



ABG Pozidrain 7S250D/NW8

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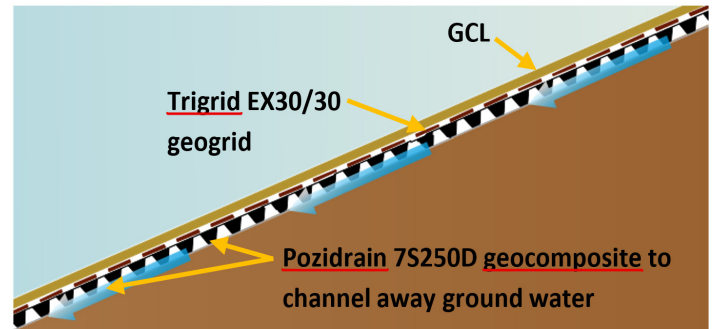
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The Solution

ABG's **Pozidrain 7S250D/NW8** was specified along with a GCL to provide an impermeable lining system. **Trigrid EX30/30** was used alongside Pozidrain to enhance the interface shear friction and anchor the geocomposite in place onto the steep slopes.

The Pozidrain layer provides a void to channel ground water and gases away to a drainage culvert. The 6mm drainage core thickness involved a significantly reduced construction depth compared to using crushed stone and represented significant financial and carbon savings. The finished pond has created a large natural water feature and area of new habitat for local wildlife.



Forder Valley detention basin pressure uplift relief drainage design

The ABG Service

ABG's design department worked with consultants AECOM and Balfour Beatty to produce a cost effective and sustainable geosynthetic solution.



Pozidrain and Trigrid rolls on site & during installation (inset)



The completed detention ponds at the Forder Valley link road

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