

A90 TRUNK ROAD SCHEME PORTLETHEN, SCOTLAND

SLOPE REINFORCEMENT

Product: GEOMAC®

Problem

The new £12m Portlethen Interchange on the A90 trunk road, has been constructed to provide road access to a new residential, commercial and retail development in the village of Portlethen, 8 miles south of Aberdeen. Over 800 houses are being built there by Scottish developer, Stewart Milne Group.

The proximity of nearby houses also meant that a steep, 65 degree embankment was required on the South-bound off-slip. The client, Transport Scotland, wanted a natural looking, yet engineered solution to the slope stability issues prevalent on the embankment slopes either side of the new highway.

Solution

Consulting Engineers for the project, Fairhurst Partners selected a soil nailing solution in conjunction with Maccaferri Geomac System; an innovative slope stabilisation/erosion protection system from Maccaferri Ltd.

Geomac Mattresses are large flat wire cages, similar to gabions, 6m x 2m x 0.23m, lined with filter fabric and filled with stone and soil. When installed and seeded, they create stable erosion protection panels of retained and encapsulated topsoil that promote rapid vegetative growth particularly on wet slopes and, in the case of the Portlethen Interchange, on steeply sloping dry embankments.

The Portlethen Interchange was constructed as a cut and cover project with the south-bound carriageway installed first, followed by the northbound, with live traffic movement throughout the operation. Extensive groundwater control measures were required in the 7m deep cutting due to the high water table level in the area.



Empty Geomacs, placed on soil-nailed slope



Geomac during installation showing partially filled units



Geomac during installation

Client name:

TRANSPORT SCOTLAND

Main contractor name:

MORGAN EST

Consultant:

FAIRHURST PARTNERS

Sub contractor name:

MACCAFERRI CONSTRUCTION LTD.

Product used:

GEOMAC

Date of Construction:

MARCH - JULY 2007 (OVER TWO PHASES)

MACCAFERRI

This was excavated in 1.5m deep stages to allow the Geomac Mattresses to be fixed as work progressed. Dywidag soil nails, 8-10m in length were drilled and fixed to the Geomac Mattresses creating an efficient, stable structure.

Explaining the selection of Geomac Mattresses, Alan Blair, Technical Director of Consulting Engineers Fairhurst Partners, who designed the scheme said; "Because of the importance of A90 Dundee to Aberdeen Trunk Road, we had to have Transport Scotland Approval through the Scottish Executive for all the elements of the design. The Maccaferri Geomac System is the only one of its type using products with BBA Roads and Bridges Accreditation. It has a 120 year design life so we were totally confident of its long term performance capability"

"Transport Scotland also insisted on a green solution and the Geomac System gives us this. It really ticked all the boxes from a design, performance and appearance perspective". added Mr Blair.

Morgan Est, who is one of the UK's leading providers of infrastructure services, were the main contractors for the Portlethen Interchange with Maccaferri Construction Ltd undertaking the Geomac installation.

Almost 800 sq metres of Maccaferri Geomac erosion control mattresses were incorporated on the southbound off-slip embankment



During installation



After installation, prior to vegetation establishment



After construction, showing successful vegetation

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