Erosion Control

Erosaweb, M4 SMART Motorway J3 (Hayes) to J12 (Theale), UK

Case Study

Project Description

The M4 Motorway runs between London and South Wales and currently carries around 130,000 vehicles per day. The English stretch opened in 1971 and was originally a dual carriageway before being upgraded to three lanes with a hard shoulder in subsequent years. To meet increasing traffic demand, National Highways developed plans to upgrade the M4 to a SMART motorway between junctions 3 and 12. This is the longest smart motorway project in England to date (51km) with upgrades to four lanes in both directions. The project required adjustments to slip roads and motorway intersections along the entire route between junctions 3 (Hayes) and 12 (Theale).

The Challenge

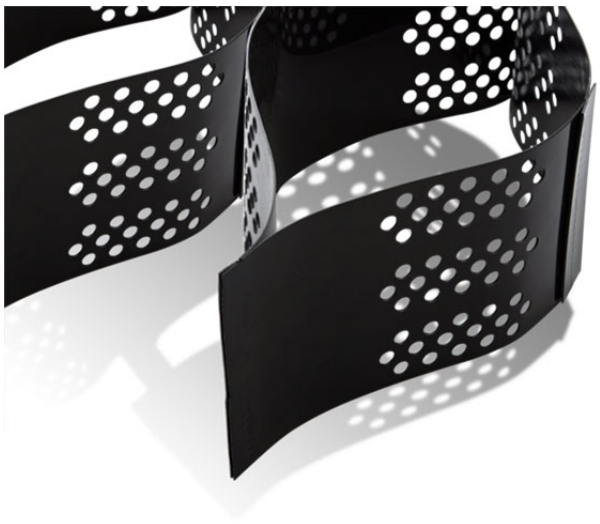
As part of the carriageway widening work, large sections of embankment were steepened and re-profiled. However, increasing batter angles can lead to surface erosion problems occurring before vegetation has had chance to establish. Once planting and grass has been allowed to take root, the embankments are better protected against heavy surface water flows and land slips. A retention solution was required to prevent the newly regraded embankments and top soil layer against instability and slippage.

The Solution

To mitigate the risk of erosion, ABG Erosaweb GWX 150/300 was selected to provide the necessary protection to a 1.5:1 slope. Erosaweb GWX is a geocellular confinement system consisting of perforated pockets into which fill material is placed. The Erosaweb option with perforated walls was selected for the M4 widening project, since this serves to allow water to percolate through the cells and prevents the topsoil fill

Project Information

Client	National Highways
Consultant	Arcadis
Products	Erosaweb GWX 150/300
Quantity	15,000 m^2
Benefits	• Retention and drainage of backfill along re-profiled steep embankment sections at J12 to enable vegetation to establish • Robust, permanent solution to prevent embankment surface erosion • Large panels for fast coverage & installation rates



Erosaweb GWX 150/300

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creative geosynthetic engineering

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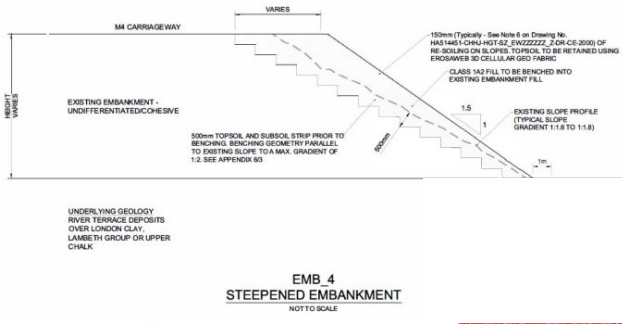
from becoming oversaturated. The large 4m x 6m GWX 150/300 panels have a cell size of 150mm deep x 300mm diameter and were simply stretched out into position down the slope before being fixed into place using steel J pins.

The retention and free drainage of soil enables a natural grass finish to quickly establish once the panels are in position and backfilled. The National Highways specification for Erosaweb provided a carbon saving alternative to placing a blanket layer of filter stone to the embankment surface. This helped to significantly improve the scheme's environmental and safety impact, in terms of the volume of quarrying and the amount of site deliveries and vehicle movements required. This was an important consideration for the project's sustainability team.

The ABG Service

In total 15,000 m2 of ABG Erosaweb GWX 150/300 panels were supplied, with supporting calculations completed for the veneer stability.



Steepened embankment drawing and illustration showing Erosaweb

Widening and re-profiling of the embankment at M4 J12

4m x 6m Erosaweb panels being expanded into position down the slope

Contact ABG today to discuss your project specific requirements and discover how our past experience and innovative products can help.

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