



## Walls and Slopes

### Geosynthetic Reinforced Soil

#### A 6102 in Sheffield, United Kingdom

Soil Reinforced Embankment using **Fortrac**® Geogrids



#### Situation

During the summer of 2007 the UK was hit by a number of severe storms which caused major disruption to the infrastructure network. Unusually heavy rainfalls weakened the embankment of the A 6102, which is a major commuter route to the centre of Sheffield, leading to its failure and collapse into the River Don. The highway supported by the embankment was deemed unsafe and closed to traffic whilst a suitable solution was sought.

#### Solution

Due to the unstable condition of the slope and associated slip debris, determination of the exact nature and extent of the reinstatement works was not feasible, hence an adaptable solution was required. It was decided by the client's designers White Young Green, to stabilise the embankment toe with concrete piles and reconstruct the main embankment with a steep reinforced soil slope. The reinstated slope had an inclination of up to 60° and a maximum height of 10m over a length of approximately

60 m. The upper part of the embankment was unreinforced with a slope inclination of approximately 27°.

The reinforced soil embankment comprised a wraparound face construction, which used various strength grades of HUESKER's **Fortrac**® geogrid, with a front face consisting of top soil and a green mesh (**HaTe**® 23.142 GR) incorporated behind the **Fortrac**® geogrids. Upon completion, the reinforced soil embankment was hydro-seeded with a drought-tolerant seed mix to aid and promote vegetation and help the reconstructed slope blend into the scenic Don Valley.

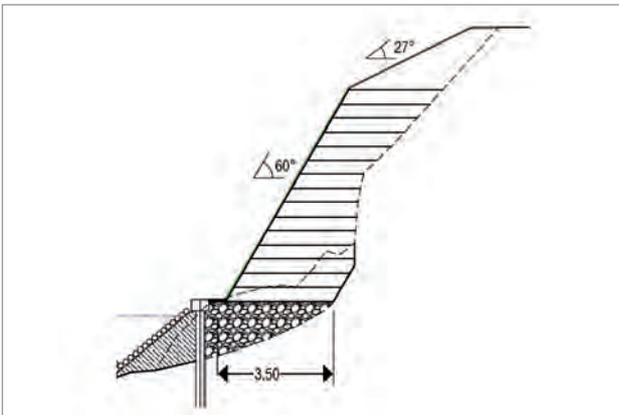
**Fortrac**® polymeric soil reinforcement provides a cost-effective alternative to more 'conventional' retaining solutions. The geogrid's high-modulus, low-creep characteristics ensure slope deformations are minimised, ensuring long-term performance.





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### Site Challenge

One of the major project issues was accessibility along the bank of the River Don, which flows parallel with the toe of the highway embankment. In order to provide a safe working platform, for the piling rigs and construction plant, at the base of the failed embankment, bulk bags, filled with imported fill, were placed in the river, to form the edge of the temporary access platform. Additional fill was placed behind the bulk bags to provide a level working platform to install the toe piles and allow construction of the steep reinforced soil slope.

The A 6102 was originally scheduled to re-open at Easter 2009. However, the client and contractor agreed to accelerate the construction program allowing the road to re-open in late 2008, several months ahead of schedule.



### Advantages

- Very flexible solution in construction, engineering and landscaping
- Excellent integration with the existing environment
- **Fortrac**® allows the re-use of local fill
- Economical solution
- Environmental solution - lower CO2 emissions compared to alternative construction solutions



Location: A 6102, Sheffield, United Kingdom

Client: Sheffield County Council

Consultant: White Young Green

Contractor: Carillion

Year of Construction: 2008

Products: **Fortrac**® geogrid, type 55/30-20  
**Fortrac**® geogrid, type 35/20-20  
**HaTe**® woven, type 23.142 GR

#### HUESKER LIMITED

3 Quay Business Centre  
Winwick Quay, Warrington  
Cheshire, WA2 8LT  
Phone: +44 (0) 1925 629 393  
Fax: +44 (0) 1925 629 394  
Mail: info@HUESKER.co.uk  
Web: www.HUESKER.com



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