

CLIFF FACE EROSION PROTECTION

CAT & DOG STEPS, SUNDERLAND, UK

SLOPE PROTECTION

Product: Enkamat Turf Reinforcement Mat

Problem

Erosion and soil instability had closed a section of the Roker Promenade, Sunderland, UK, which is at the base of a 25m high cliff. The solution had to be installed quickly and establish a permanent grass cover that would be secure into the future.

The outcrop of rock is overlain with soft clay soils. Weathering had caused instability to the clay layers so that shallow slips and loose material were a hazard to the users of the promenade.

Solution

Maccaferri Ltd. and specialist contractor, John Hellens Ltd, proposed a 'design and installation' solution which would provide a reinforced turf cover. By preventing erosion, debris would not fall onto users of the promenade below.

Turf Reinforcement Mats (TRMs) are widely used in these applications. TRMs are permanent, non-degradable erosion control mats. If the vegetation dies back through disease or is washed out during storm events, the permanent TRM will still be present to protect the slope surface. A biodegradable mat would not be able to provide long term protection.

To establish a permanent grass mantle, good quality topsoil had to be placed on the cliff top slope and secured against erosion. Enkamat was selected as the best solution. This is a thick three-dimensional polymeric geomat, with a high roughness and an open matrix (95% voids) to entrap seed and soil.

The Enkamat was secured at the slope crest in an 'anchor trench', and then unrolled and anchored to the 1:3 slope. Adjacent panels of the TRM were overlapped and secured.



MacMat® N20 / Enkamat® is secured into an anchor trench



Topsoil and seed are brushed into the TRM matrix



The completed solution following vegetation establishment

Client:

SUNDERLAND DISTRICT COUNCIL

Main contractor:

JOHN HELLENS (CONTRACTS) LTD

Designer:

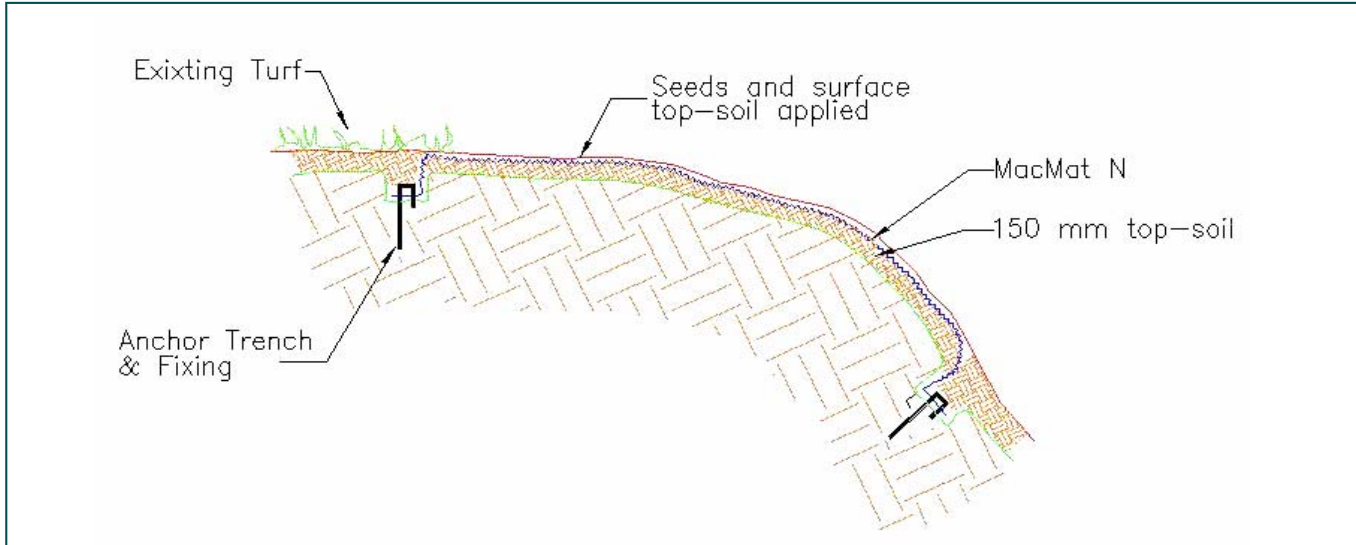
MACCAFERRI LTD. (UK)

Products used:

10,100 M² MACMAT® / ENKAMAT® 7018

Date of construction

March 2001



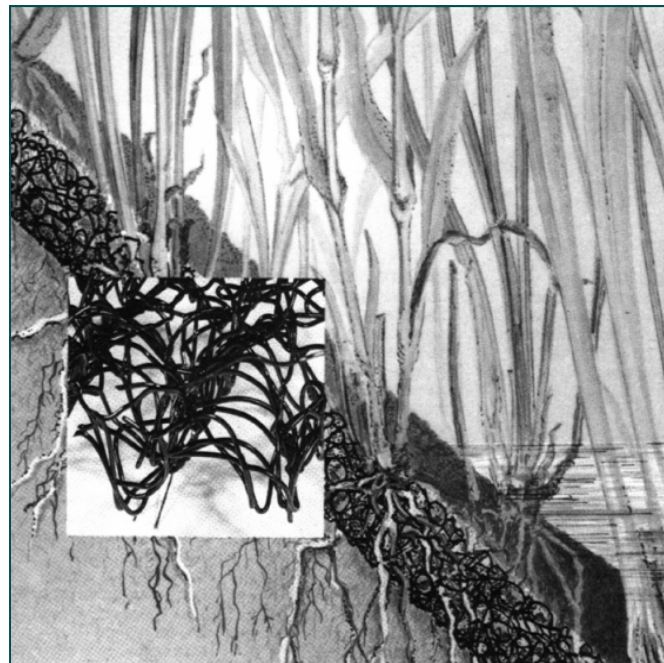
Typical section

Seed and soil were brushed into the matrix preventing it from eroding down the slope. The seeds germinate and the roots lock into the synthetic TRM matrix creating a reinforced turf cover.

Unlike other TRMs, the 95% void volume of Enkamat is easily accessible to soil and seeds due to the random open configuration of the polymer fibers within the matrix. This offers superior retention of soil and seeding (or hydroseeding), allowing seed to easily percolate through the mat and into contact with the nutritious topsoil beneath. This is essential to give species the best possible opportunity to germinate.

Enkamat provides the following additional benefits;

- Lightweight and easy to install on difficult sites
- Provides immediate protection of exposed areas from direct effects of wind and rainfall impact
- Soil and seed easily penetrate the extruded fibers of the mat matrix.
- Protects seeded topsoil from washing out before vegetation has established
- Creates an environment that enhances the growth of vegetation through the mat
- Reinforces the root system of plants, further binding the soil surface and increasing shear resistance of the surface.
- Reduces the velocity and volume of run-off flow by increasing water percolation into the soil.



Detail showing matrix of Enkamat

Following a successful installation, the cliff top was left with robust long-term surface protection.

Maccaferri Ltd - Head Office

7600 The Quorum,
Oxford Business Park, North,
Garsington Road, Oxford, OX4 2JZ
Tel: 01865 770555
Fax: 01865 774550
Email: oxford@maccaferri.co.uk
Web: www.maccaferri.co.uk

Area offices

Perth:
T: 01738 621317 F: 01738 442283 E: perth@maccaferri.co.uk
Belfast:
T: 028 9026 2830 F: 028 9026 2849 E: belfast@maccaferri.co.uk
Dublin:
T: 01 885 1662 F: 01 885 1601 E: dublin@maccaferri.ie
Web: www.maccaferri.ie



Oxford, Perth, Belfast