

REINFORCED SOIL SUPPORTS NEW A2 MOTORWAY
EGNATIA-ODOS, ANTHOHORI, GREECE

RETAINING WALLS & SOIL REINFORCEMENT

Product: Terramesh[®], ParaLink[®], MacMat[®] R

Problem

The 670km Egnatia Odos motorway is one of the largest and most ambitious civil engineering projects in Greece. The motorway runs across Northern Greece from east to west. It starts at Igoumenitsa and travels across the Prefectures of Thesprotia, Ioannina, Grevena, Kozani, Imathia, Thessaloniki, Kavala, Xanthi, Rodopi and Evros, to the village of Kipi on the Turkish border.

On the Anthohori-Metsovo section of the new motorway, the alignment passed through some challenging topography. The mountainous territory required numerous tunnels, viaducts and embankments to be constructed. On this particular section a 50m high structure was required to carry the highway into a tunnel section. The solution also had to have a minimal environmental impact with as small a land-take as possible.

This section of the construction was awarded to contractor J&P Avax.

Solution

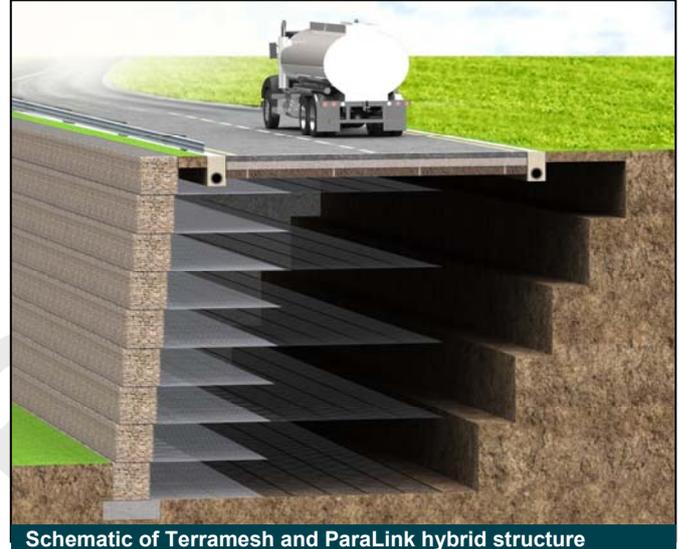
Maccaferri assisted the project team by providing feasibility studies, geotechnical design and on-site support services for the 50m high embankment.

The embankment was in two parts:

- Lower 30m - 3 x 10m high cut slopes with intermediate terraces
- Upper 20m - Reinforced soil embankment founded upon the cut slopes beneath

The lower terraced slopes were cut from the existing ground profile and provided a foundation to the reinforced soil embankment above. These cut slopes were protected by MacMat[®] R to prevent erosion and also to promote the establishment of vegetation.

The 20m embankment above was constructed from a Maccaferri Terramesh[®] and Paralink[®] soil reinforcement 'hybrid' system.



Schematic of Terramesh and ParaLink hybrid structure



ParaLink primary soil reinforcement being placed

Client:

MINISTRY OF INFRASTRUCTURE, TRANSPORT & NETWORKS

Main contractor:

J&P / AVAX

Designer:

MACCAFERRI

Products used:

TERRAMESH, PARALINK, MACMAT R

Date of construction

2003 - 2006



Backfill placed and compacted upon ParaLink



Completed structure showing harmonious integration with the environment and revegetation of cut slopes

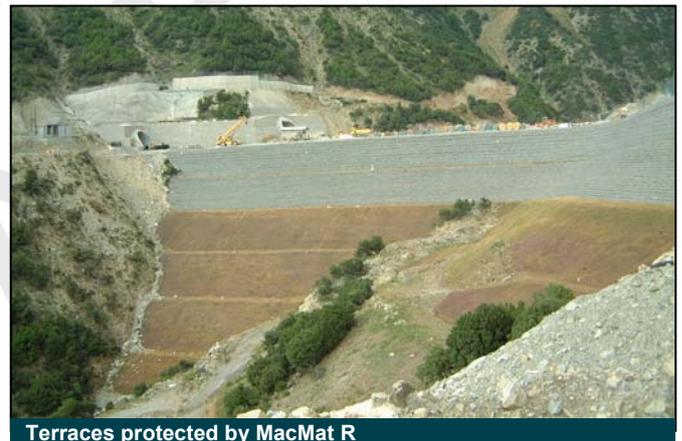
ParaLink® geogrids with an ultimate tensile strength of 400kN/m were used as primary soil reinforcement. It is engineered from polyester fibres encased within an ultra-tough polyethylene sheathing. Available in strengths up to 1350kN/m, it is ideal for use in these demanding seismic zones.

Maccaferri's Terramesh® System provided the secondary reinforcement and was selected for its inherent flexibility. Terramesh consists of a modular gabion fascia element, with an integral steel wire woven mesh geogrid tail. The geogrid is sandwiched between layers of compacted backfill, reinforcing it. This enables the soils to stand steeper, accommodate greater loads and settle less than an unreinforced soil.

The system enabled the reuse of site-won fills, excavated and cut from elsewhere on the site which offered a cost effective and environmentally-friendly solution.

Both ParaLink® and Terramesh® are BBA Certified.

Approximately 8,000m² fascia area of reinforced soil was constructed, which included around 120,000 m² of ParaLink® 400.



Terraces protected by MacMat R



Structure nearing full height - note tunnel portals

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