MACCAFERRI

CASE HISTORY

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MIXED RSS FOR THE RRESHEN-KALIMASH HIGHWAY

DURRËS, WESTERN ALBANIA, ALBANIA

Slope Protection

Problem

The 103 km long motorway is a key connection between Durres Port, Albania's primary harbour on the Adriatic Sea and Kosovo. Journey times of between six and ten hours will be reduced to two by this new road and the new route will serve to stimulate the economy in Albania's North Eastern region.

Due to the mountainous topography of the area, many sections of the motorway run alternately through large steep embankment fill sections and slope cuts, with soil reinforcement, rock-fall protection, erosion control and revegetation measures required. The availability of large quantities of rock fills generated by the slope excavations made the choice of embankment fills a more cost effective alternative to the construction of viaducts.

Of the 70 retaining walls required, those up to 15m high were constructed of concrete. However, the 30 walls over 15m high were designed as reinforced soil structures to re-use site won fill and reduce the visual impact.

Solution

Bechtel-Enka brought in geotechnical specialists, Officine Maccaferri in a partnership arrangement to provide engineering design solutions for the walls. Maccaferri's responsibility encompassed the design assistance, structural calculations and construction drawings for the 30 walls. For 20 of the walls, Maccaferri also provided supervision and construction management through its local partner Albania Draht.

The 30 composite reinforced soil structures have a total facing surface area of more than 35,000 m2, with the maximum wall overall height of 40 m. The walls, where a steep (84°) facing was required, have been constructed using a hybrid reinforced soil system, combining two Maccaferri products; -Terramesh® System, a double-twisted steel wire mesh unit which forms structures with the aesthetics of gabions but with the reassurance of soil reinforcement -ParaLink® 300, a high strength polyester geogrid (primary reinforcement).

The ParaLink was spaced at 1 or 2m vertical centres depending upon the design requirement. These walls are among the highest of their type constructed anywhere

Client: MINISTRY OF PUBLIC WORKS & COMMUNICATIONS ALBANIA

Designer / Consultant: ALBANIA DRAHT / MACCAFERRI

Contractor: BECHTEL-ENKA JOINT VENTURE

Products used (Qty.)

- Terramesh 999
- ParaLink 999
- Dynamic barrier RB 1000 999
- Steelgrid 999
- MacMat R - Steel 999

Date of construction: 03/2008 - 10/2010

The first courses of the tallest wall being constructed

Laying Paralink primary reinforcement

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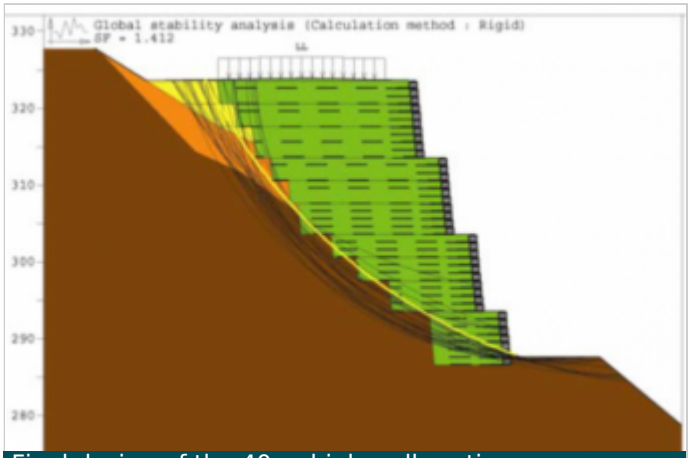
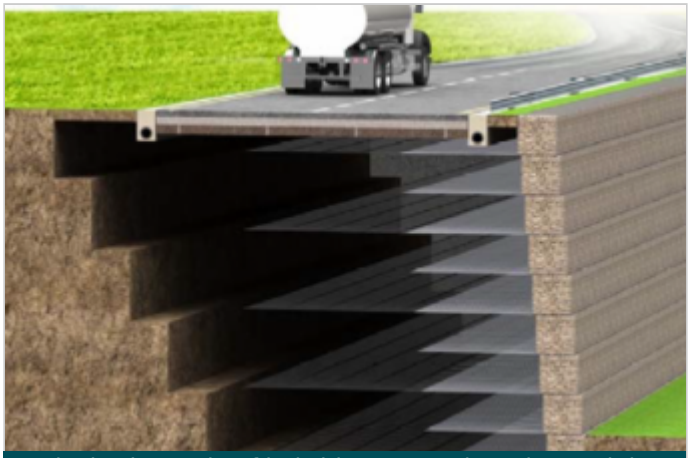


Final design of the 40 m high wall section


Typical schematic of hybrid Terramesh and ParaLink wall


The tallest wall nearing completion


The lower wall nearing completion


Completed reinforced soil structure with slope stabilisation measures above high

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