

## REINFORCED EARTH SOLUTION for Albanian Motorway Project ALBANIA , Reps

### RETAINING WALL / ROCKFALL PROTECTION

**Products:** Terramesh System, Paralink 300, Steelgrid MO, Macmat R, Rockfall Barrier.

#### Project

The 103 km long Project from Rreshen to Kalimash, of which 64 km awarded to the Bechtel Enka Joint Venture (BEJV), is a key connection between Durnes Port, Albania's primary harbor on the Adriatic Sea, and Kosovo. In addition to the great amount of travel time saved, which will be 2 hours instead of 6 hours, this new route will serve to stimulate the economy in Albania's northeastern region. All construction work was completed by September 2009.

The Motorway is designed as dual carriageways of 2 x 3.75 m, supplemented with 2.0 m emergency shoulder lanes on the challenging topography of the Albania mountains terrain at an altitude over 1,000 m. In particular due to mountainous morphology of the area, many sections of the motorway run alternatively through large steep embankment fill sections and slope cuts, with soil reinforcement, rock-fall protection, erosion control and re-vegetation measures required .

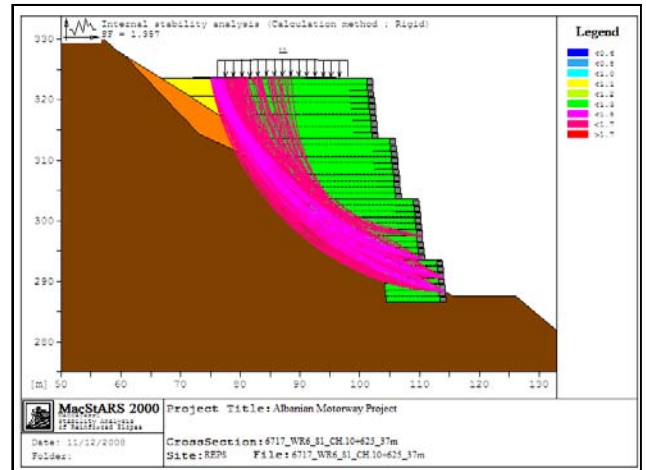
#### Solution

Maccaferri was responsible for the design, the supply, the installation, through its branch Albania Draht, and full assistance during the construction of not less than 30 composite reinforced soil structures for a total facing surface of more than 35,000 m<sup>2</sup> and with the maximum wall height of 40 m including foundation. (see Pictures 1-2-3)

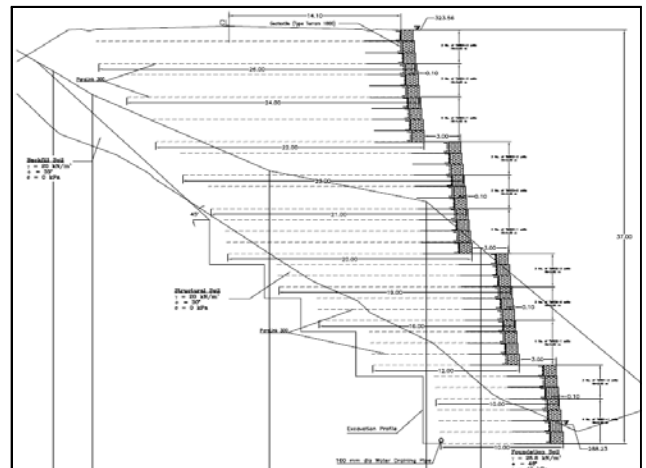
The walls were constructed and steep wall faces (9deg off vertical) were required. These were achieved using a composite mechanically stabilized reinforced soil system, combining two Maccaferri products: Terramesh System, a galvanized and PVC coated double-twisted steel wire mesh unit forming the rock filled facing section and secondary reinforcement, combined with Paralink 300, a primary reinforcement made with high strength polyester geogrids encased in a durable polyethylene sheath.

These walls are amongst the highest of their type constructed anywhere in the world.

On the slopes above the walls, rockfall protection, erosion control and re-vegetation measures were installed to protect the motorway below and to promote rapid establishment of stabilising, vegetative cover. Maccaferri Macmat R16822GN (see Picture 7) was used for these two last functions instead SteelGrid MO 150 (see Pictures 5-6) , all in conjunction with anchors, and rock bolts of various types and 500 kJ high resistance rockfall barrier CTR 05-07-B were installed as rockfall protection . Specialist design assistance was provided by Maccaferri.



Pic. 1- design



Pic.2- shop drawing



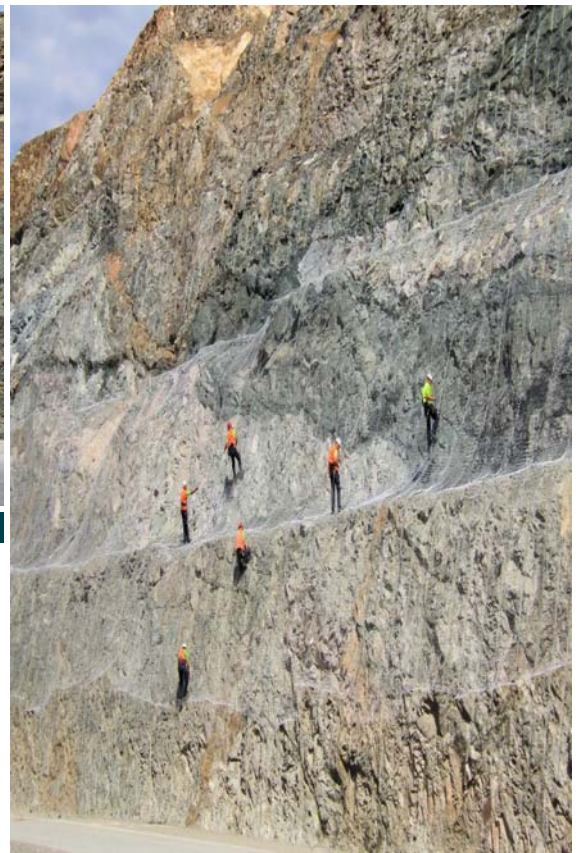
Pic. 3.- the highest wall during the construction



Pic.4 - overview of the highest wall



Pic.5- Steelgrid application



Pic. 6-Steelgrid application



Pic. 7- Slope covered by Macmat R (brown)

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