

RETAINING WALL NO. 10 FOR MOUNTAIN ROAD TO JABEL JAIS. JABEL JAIS, RAS AL KHAIMAH , U.A.E.

Reinforced Soil Walls and Slope Reinforcement

Problem

The highest peak in UAE, Al Jais, is located in the Northern Emirates of Ras Al-Khaimah, 25 Km away from the main town. As per the master planning, the mountain top is to be developed as a unique tourist destination with resorts, the world's longest zip line, golf course, etc. The proposed 36 km long road to the mountain peak site rises to a height of 700 meters. As it is the highest peak in UAE, construction ought to be challenging due to large quantity of earthworks, difficulty in access, moving up construction machinery, etc. The existing site condition required a nearly vertical retaining structure of height 32m between chainages 20+350 to 20+575. Additionally, the site receives occasional rainfall & snowfall. During the rains, flash floods are very common in this region, which even washes away the entire road and underlying embankment. Consequently, the high retaining structure must also be naturally free draining and stable against the potential effect of additional hydraulic forces behind the structure.

Solution

Maccaferri was subcontracted for design, supply, and construction assistance of the 32m high retaining wall with Terramesh system, a widely used composite system by combining high strength ParaLink geogrids along with Terramesh facing units. This solution is a lot more cost-effective and easy-to-apply, particularly for such high structures. The constructed total facia area of retention is 4100 m², ranging in height between 5m to 32m. The site strata primarily consisted of sedimentary rock, which varied from weathered to hard rock conditions. The backfill material used between ParaLink geogrid layers contained relatively larger particle sizes, thanks to the superior polyethylene coating on the geogrid material's polyester core. The possibility of using local materials like high graded backfill material and boulders for gabion facia resulted in considerable cost savings in the project. The actual site conditions varied a lot from the design conditions that resulted in few design revisions, but due to the flexibility of the Terramesh system; the units could be easily modified/deformed at the site to match the site conditions.

Client: Public Service Department, Ras Al Khaimah.

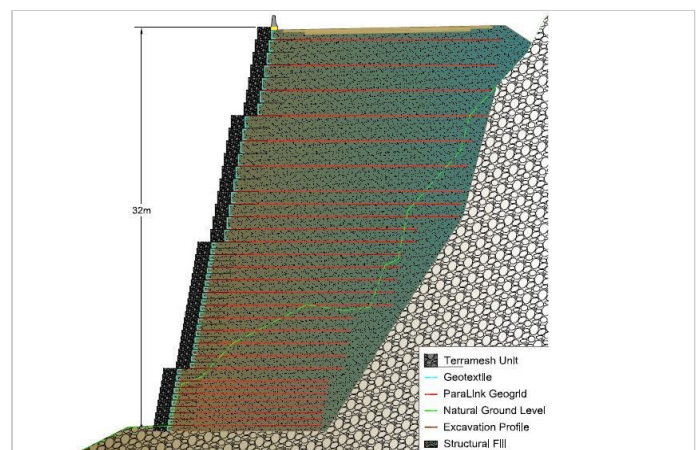
Designer / Consultant: Halcrow International Partnership

Contractor: General Mechanic Company

Products used (Qty.)

- Terramesh	4,100 m ²
- ParaLink	32,500 m ²

Date of construction: 11/2012 - 08/2013



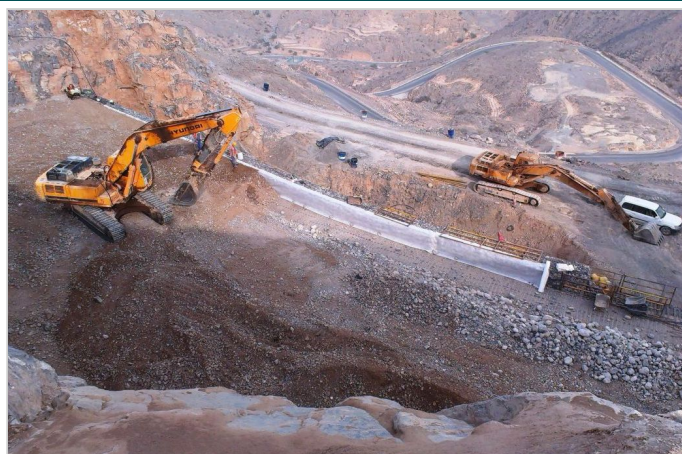
Sectional detail of Terramesh retaining wall with ParaLink 300 geogrid



During construction: initial layer of Terramesh and ParaLink geogrid placed



During construction: light & heavy compaction of backfill material



Bird's eye view of wall location under construction



During construction: Terramesh retaining wall nearing completion



Close view of completed wall at maximum height location



Distant view of completed Terramesh wall

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