

## TELAL EL SOKHNA' PROJECT

### AIN EL SOKHNA , SUEZ GOVERNORATE, EGYPT

#### Reinforced Soil Walls and Slope Reinforcement

##### Problem

'Telal El Sokhna' is a real estate development project located along the longest beach promenade in Ain El Sokhna, Egypt, between majestic mountains and the pristine waters of the Red Sea. To ensure a panoramic view of the sea for most of the community, the architect designed the project at several levels in relation to sea level, ranging from +7m to +84m. Consequently, a retaining wall of 560m in length and height up to 19m was needed parallel to the shoreline. The original high RCC walls couldn't primarily meet the architectural requirement of having a facing that would seamlessly integrate with the surrounding dolomite mountains. In addition, since the sub-soil conditions are not competent, the RCC wall must be founded deeply over a thick boulder layer, making it prohibitively expensive to construct.

##### Solution

Maccaferri's Paramesh MSE Wall system (with Terramesh facia units & Paralink geogrids) was eventually implemented, being a cost and time-effective alternative. The Terramesh units meet the architectural requirement as the gabion face could be filled with the local dolomite stones. The in-situ soil's bearing capacity was limited to 250 kPa, while the actual bearing load at the RCC wall's toe was 310 kPa. It was necessary to excavate 1.5m and to replace them with compacted boulders before reaching the native soil to reduce the bearing load to 250 kPa. As a result, the embedment depth in the cantilever wall rose to 3m, followed by a 1.5m thick replacement layer, making the excavation depth 4.5m below ground level. The flexible nature of Paramesh MSE wall limits the bearing capacity check to shear failure; therefore, the wall can be found at a shallow depth by ensuring sufficient safety. Due to this, the RCC wall height and depth of excavation were always more significant than the Paramesh MSE wall option for the same clear height. By implementing a Paramesh MSE wall option over an RCC wall, the client achieved overall cost savings of 40%. Maccaferri's local agent 'Strata Soil System' was subcontracted for the project's design, supply, and construction assistance of the Paramesh MSE wall.

**Client:** Roya Developments

**Designer / Consultant:** Okoplan Engineering Consultation

**Contractor:** Roya Developments

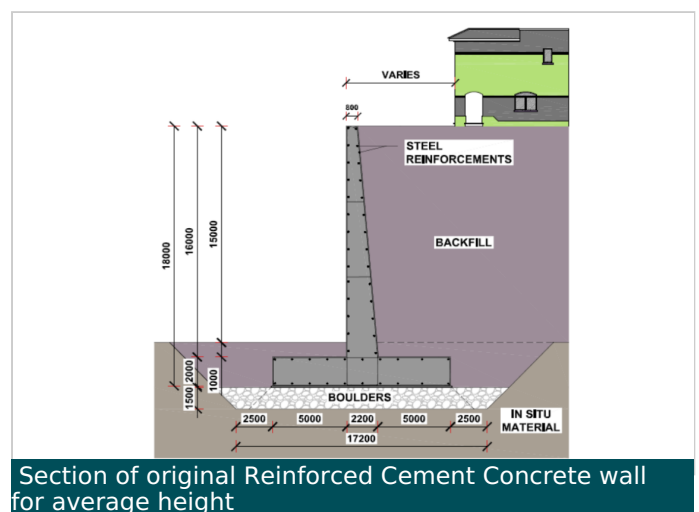
**Products used (Qty.)**

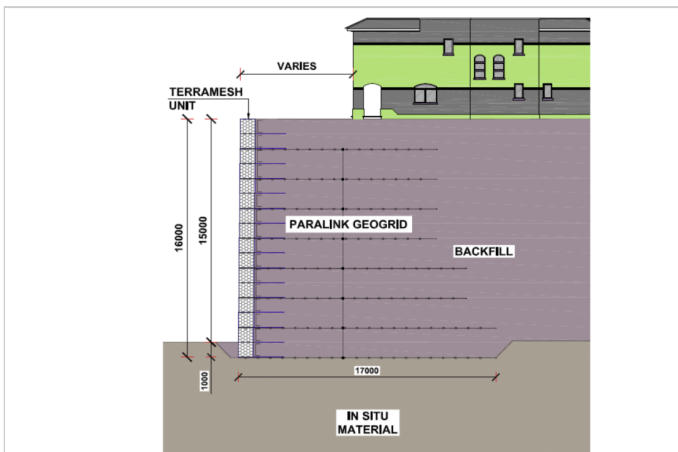
- Terramesh 8960 m<sup>2</sup>

**Date of construction:** 08/2017 - 10/2019

[Google Maps](#)

[Google Earth](#)





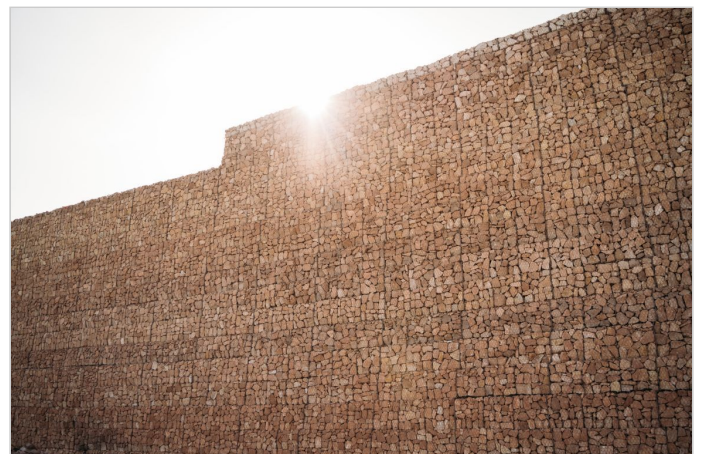
Section of implemented Paramesh MSE wall for average height



During construction: initial site activities



During construction: Paramesh MSE wall installation in progress



Completed: close view of Paramesh MSE wall



Completed: aerial view of Paramesh MSE wall