REINFORCED SOIL RETAINING WALLS
Product: Terramesh System, ParaLink300, Geotextile.

Project Background:
The proposed “15.002 ZAZV Private Residential Villa” project site was located at Shati Al Qurum, Opp. to Royal Opera House, Muscat, Oman. The project site topography was a sloped terrain with an elevation difference of 10-12m from the design gate level. Hence construction of a Retaining wall was inevitable.

However, the owner of the project wanted an alternative retaining wall solution other than the conventional RC Retaining wall with a reduced cost and have a different aesthetic, environmental friendly appearance. Thus the consultant recommended Maccaferri for a better retaining wall solution which meets the requirements of the project owner.

Solution:
Maccaferri was thus invited by the client & consultant to provide a design, supply and construction supervision solution of the ~10m high retaining wall for the proposed residential building project mentioned above.

Based on the nature of the project, Maccaferri’s ParaMesh Retaining wall system was proposed by our design engineers, finding it as the best fit solution for this project. Typically, ParaMesh is a composite soil reinforcement system with different types of soil reinforcement used with the following Maccaferri products:

- **Terramesh System® (TMS)**, a double twisted hexagonal steel wire mesh unit which forms the facia, with the aesthetics of gabion and with the reassurance of a secondary soil reinforcement to prevent sloughing failure of wall face.
- **ParaLink® (PL)**, a high strength polyester geogrid (Primary Reinforcement)
- **Geotextile (Non Woven)**, is used as separator between the inside face of the Terramesh system (gabion fascia) and the structural fill soil in order to prevent escape of the fine particles from backfill into the gabion facia voids.

Client:
Mr. Zayed

Main contractor:
PZ International LLC, Oman

Consultant:
Intec-Tusker

Designer:
Maccaferri Middle East LLC

Products used
TMS (8x10), ParaLink 300™

ParaLink Installation Works:
Start Date: 25-Aug-2016
Completion Date: 08-Sep-2016
Design Sections:

As per the architectural requirement of the project the retaining wall heights varied from 2m to 10m to reach to the proposed formation level & hence several sections with different wall heights were analysed by our design engineers. All the analyses were done as per BS 8006:2010, using MacStars-W Software.

A surcharge load of 36KPa above the proposed ParaMesh wall and a seismic horizontal coefficient of 0.98m/s² was also considered in the design. The primary reinforcement used was PL300°.

The foundation ground was a competent strata (rock), hence a trapezoidal design section with the primary reinforcement length at the base was considered as 0.4H, 0.55H at the middle and 0.7H at the top. Different soil layers modeled in the design analyses is given below along with their properties:

<table>
<thead>
<tr>
<th>Soil Properties</th>
<th>Foundation Soil / Rock</th>
<th>Reinforced Soil</th>
<th>Retained Backfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Wt. (kN/m³)</td>
<td>20</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Friction Angle (deg)</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Cohesion (kN/m²)</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Poisson's ratio</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Typical Design Section (Eg:10m Height, Global Stability)