

JUMEIRAH HOTEL QAS POOL DUBAI, MIDDLE EAST, U.A.E.

Seawalls and Shoreline Structures

Problem

M/s. AK Design was appointed by Jumeirah Group to develop a new swimming pool at Al Qasr within the Madinat Jumeirah project in Dubai. The swimming pool is to be located on the open beach front of the hotel.

The Marine designer considered a return period of 1 in 100 years for the extreme design storm condition and the client required a design life of 50 years for the pool. For the required 50-year design life, the probability of the 1 in 100 year storm event happening is approximately 40%. The cross-shore beach response modelling studies revealed that the potential scour below the pool can be as deep as 2.5m. Consequently, the foundations of the pools must be designed to prevent lateral movement, settlement and tilting of the pool when the beach sand is mobilised.

Different conventional foundation protection options were considered by the designer out of which secant pile option was recommended. However, the end client identified the following practical disadvantages with the secant pile wall solution; (1) Moderately costly (2) Significant disturbance to hotel guests due to noisy construction, (3) Heavy equipment required, (4) Reflects wave energy leading to beach scour and (5) Poor appearance when uncovered.

Solution

The contractor approached Maccaferri Middle East to propose an alternate protection solution. Maccaferri proposal consisted of (1) retaining wall & (2) scour protection functions. For the retaining wall function, a 2m high Terramesh wall was chosen. As primary soil reinforcement, geogrid type 'Paragrid 100' was considered for the entire base of the pool. For the scour protection function for extreme storm event, additional gabion mattress and sacrificial gabions were considered surrounding the Terramesh retaining wall. Considering a maximum scour of 2.5m from extreme storm event, a width of 4m was proposed for the gabion mattress apron.

Maccaferri solution avoids the above-mentioned disadvantages of original secant pile wall option. Further, based on the techno commercial evaluations, Maccaferri solution was chosen by the client after critical review and approval by the designer.

Client: Jumeirah Group

Designer / Consultant: AK Design

Contractor: Desert Leisure/Desert Group

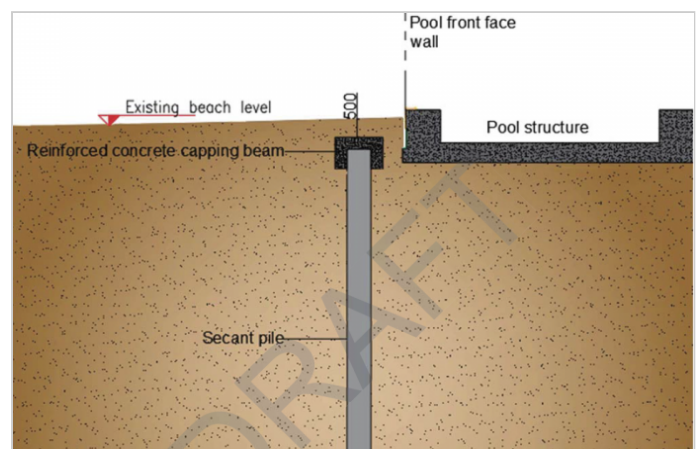
Products used (Qty.)

- Terramesh	172 m2
- Reno Mattress	576 m2
- ParaGrid	1560 m2
- Gabion	317 m3

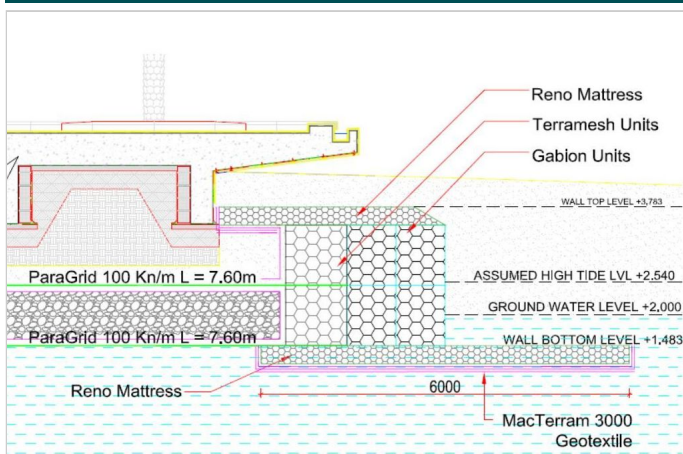
Date of construction: 08/2019 - 09/2019



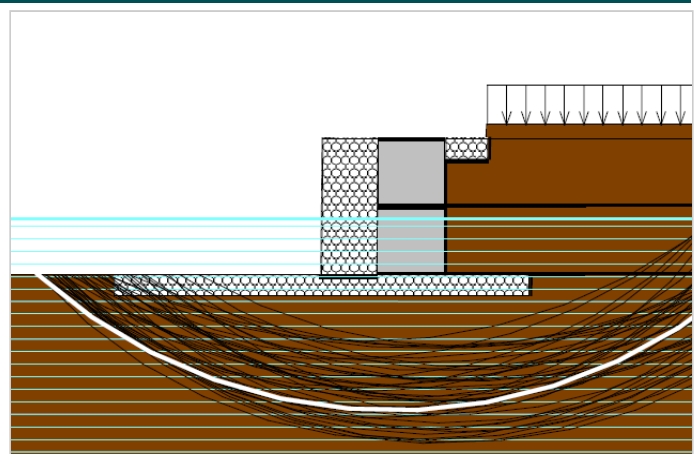
Project Location



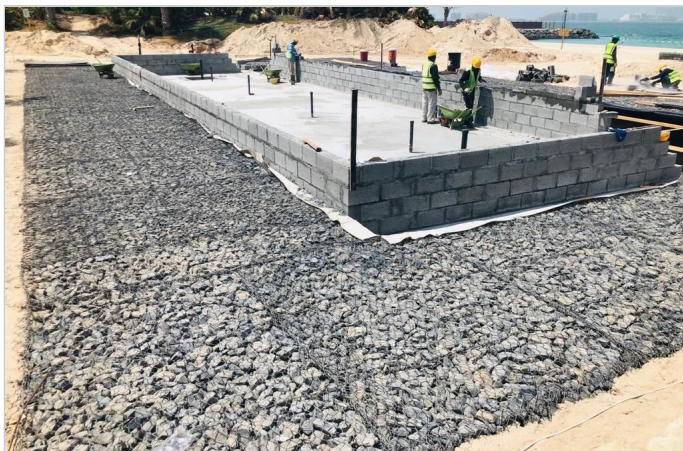
Original solution of secant pile wall around the pool



Maccaferri alternate solution with Terramesh, gabions & mattresses



Design of Maccaferri protection solutions



Gabion mattresses apron during construction



Terramesh System with Gabion sacrificial protection wall - during construction



Pool constructed above buried protection structures

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