

**JUMEIRAH HOTEL MAS POOL**  
**JUMEIRAH , DUBAI, U.A.E.**

Seawalls and Shoreline Structures

**Problem**

M/s. Jumeirah Group appointed AK Design to develop the new MAS swimming pool at Al Qasr within the Madinat Jumeirah project in Dubai. The swimming pool is to be located on the open beachfront 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 1 in 100-year storm event's probability is approximately 40%. The cross-shore beach response modeling studies revealed that the potential scours below the pool could be as deep as 2.5m. Consequently, the pools' foundations must be designed to prevent lateral movement, settlement, and tilting of the pool when the beach sand is mobilized.

The designer considered different conventional foundation protection options 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 pool's entire base. For the scour protection function for extreme storm events, additional gabion mattresses and sacrificial gabions were considered surrounding the Terramesh retaining wall. Considering a maximum scour of 2.5m from an extreme storm event, a width of 4m was proposed for the gabion mattress apron.

Maccaferri solution avoids the above-mentioned disadvantages of the original secant pile wall option. Based on the techno-commercial evaluations, the 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

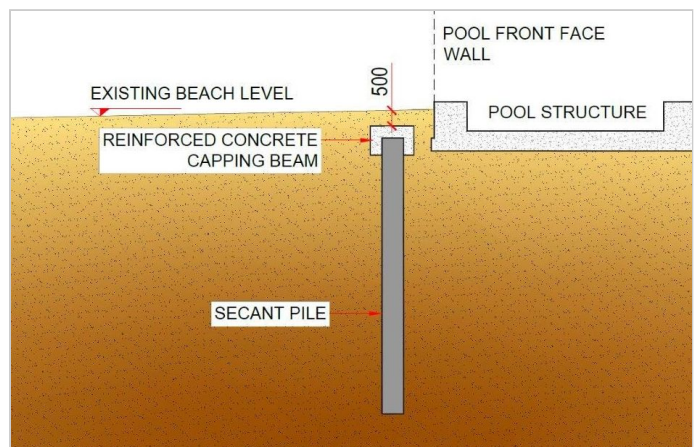
**Products used (Qty.)**

- Terramesh	170 m2
- Gabion	315 m3
- Reno Mattress	550 m2
- ParaGrid	1500 m2

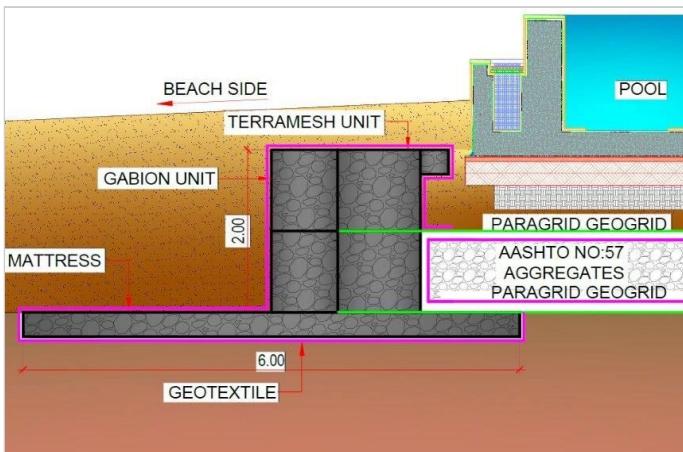
**Date of construction:** 07/2020 - 10/2020



Architectural rendering of the proposed MAS pool close to beachline



Original solution of secant pile wall around the pool



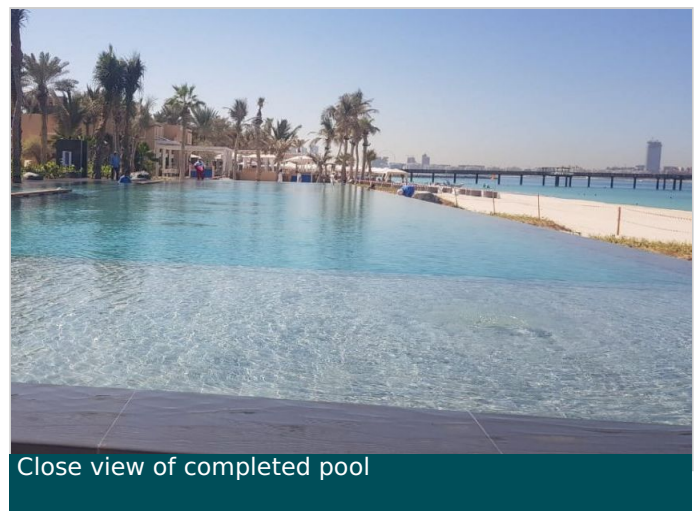
Maccaferri alternate solution with Terramesh, gabions & mattress



During construction: terramesh & Gabion protection walls in progress



During construction: backfilling in progress with AASHTO no. 57 aggregates



Close view of completed pool



Distant view of completed pool constructed above buried protection structures

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