MACCAFERRI

CASE HISTORY

Rev: 1, Issue Date 30.12.2024

WADI HANIFA PROTECTION PROJECT

AL JUBAYLAH, RIYADH, SAUDI ARABIA

Longitudinal Protection

Problem

The Wadi Hanifa protection project is part of the heritage preservation initiatives in Riyadh, undertaken to safeguard the natural and cultural significance of the region. The developer, Derrah Properties, aimed to protect the boundary of their expansive real estate development adjacent to Wadi Hanifa. This required constructing a boundary retaining wall that rises up to 9 meters in height. However, the project presented several challenges. The wall needed to maintain a natural aesthetic to blend with the heritage-rich environment while being robust enough to withstand the flash floods frequently experienced in the wadi. During critical storm events, the scour depth was estimated to reach nearly 1 meter, demanding a retaining wall solution that could endure both the structural loads and hydraulic forces. Addressing these challenges necessitated a solution that balanced aesthetics, resilience, and long-term stability, making it a complex and demanding engineering structure.

Solution

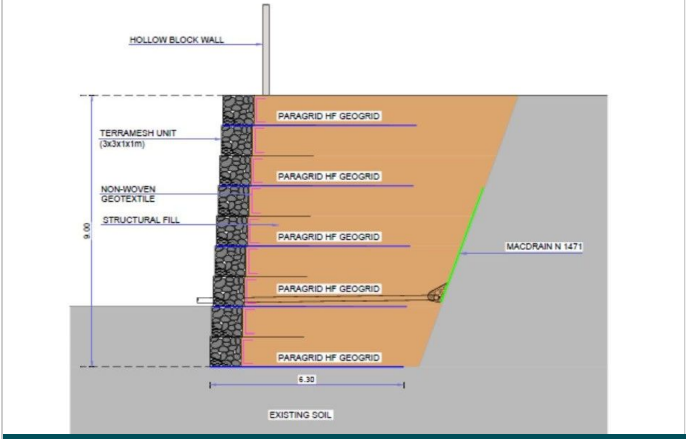
To address the multifaceted challenges of the Wadi Hanifa protection project, Derrah Properties engaged Maccaferri Middle East to propose a suitable solution. Maccaferri recommended the use of a Terramesh Mechanically Stabilized Earth (MSE) wall system, which combined structural robustness with aesthetic appeal. The gabion-faced Terramesh system was designed to act as a durable retaining wall while also addressing the scour protection requirements with its 2-meter-deep embedment, exceeding the estimated scour depth of 1 meter. To enhance the wall's visual integration with the surrounding landscape, the gabion face was filled with locally sourced limestone from Wadi Hanifa, ensuring a natural appearance. For soil reinforcement, Maccaferri utilized BBA-certified Paragrid HF geogrid, known for its superior resistance to installation damage, even with challenging rock-fill backfill. Additionally, a MacDrain geocomposite drainage layer was installed behind the wall to facilitate efficient internal drainage, preventing water accumulation and enhancing long-term stability. Maccaferri Middle East provided a comprehensive scope of services, including design, material supply, and construction assistance.

Client: Deraah Properties
Designer / Consultant: Deraah Properties
Contractor: Deraah Properties
Products used (Qty.)

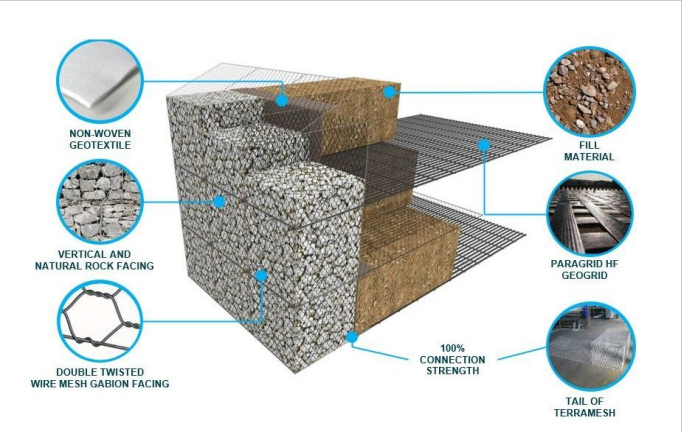
- Terramesh	Wall face area : 53,000 m2
- MonoAxial GeoGrids	Paragrid HF : 300,000 m2

Date of construction: 03/2019 - 12/2024

Google Maps Google Earth



Section of Terramesh MSE wall



Isometric view of wall components

MACCAFERRI

Ongoing Terramesh MSE wall

Ongoing Terramesh MSE wall

Ongoing Terramesh MSE wall

Weldmesh barrier above Terramesh MSE wall

Ongoing Terramesh MSE wall along a long stretch

Maccaferri Middle East
Dubai PO box 502594
United Arab Emirates
Tel:+97143608958
E-mail: info.ae@maccaferri.com