

Museum of Islamic Arts

Doha, Qatar



View of the completed development – Doha, Qatar

The Site

The Museum of Islamic Arts will provide a beautiful environment to showcase a vast collection of art and historical artefacts.

Located on the edge of the Doha bay with a total area of approximately 45,000m² when completed, the museum will have ample exhibition space available as well as education and presentation areas.

Viewed from all angles, the completed building appears to sit in the sea, and is connected to land by a causeway and bridge.

The building work itself was completed in 2006 and the museum is scheduled to be opened to the public in 2008.

The Challenge

The construction of the island posed an important challenge. As it was to be built in the corrosive salt waters of the Arabian Gulf, it had to provide adequate foundations for the Museum.

Being constructed on reclaimed land, with foundations below the water table and highly aggressive chloride and sulphate conditions, the designers understood the need to fully protect the concrete substructure from deterioration for the design life of the structure. Hence a system able to withstand these aggressive ground conditions and water tables was required.

The Solution

Construction of the sub-structure package commenced in 2004 by SixConstruct – Midmac JV. Grace's Preprufe and Bituthene membranes were selected to provide protection to the foundation pile caps, beams and other construction up to levels above the water table. Preprufe and Bituthene membranes are fully and intimately bonded to the structural concrete providing complete protection from the aggressive ground conditions.

Preprufe® 300R is a unique membrane of its kind, consisting of a robust film of high density polyethylene (HDPE), impermeable to water, water vapour and gases, combined with a special multilaminar matrix. This matrix on one side of the membrane develops a strong capacity for adhesion when loaded by the pressure of freshly poured concrete during the pouring and successive hardening phases.

'Preprufe® and Bituthene® membranes are insensitive to variations in the water table, and at the same time an effective waterproofing solution.'

Being made from HDPE technology results in a number of benefits for Preprufe:

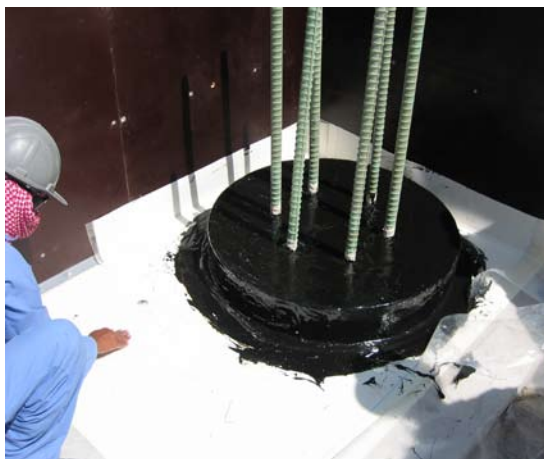
1. High impermeability to water, water vapor and gas
2. Non-perishable with time and therefore high durability
3. Resistance to aggressive gases in the water and soil.

Its tenacious adhesion to concrete ensures that Preprufe® not only protects but also becomes an integral part of the structure. This perfect sealing prevents the migration of water and moisture into the membrane and concrete interface, thereby eliminating the possible infiltration of water towards the inside of the structure.

Bituthene® 8000HC is a flexible self-adhesive membrane ideal for substructures in hot climates. Compatible with systems like Preprufe, it is water and vapour proof and provides effective external protection against aggressive soils and contaminated water.

Bituthene® LM a liquid applied waterproofing which cures to form a tough seamless rubber-like layer, was applied where necessary to ensure watertight continuity.

The superstructure was constructed by Baytur Contractor, with Grace products extensively used on the connecting bridge and causeway.



Preprufe 300R and Bituthene LM installation at the Museum site in April 2004

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PRODUCTS USED

Preprufe® 300R
Bituthene® 8000HC
Bituthene® LM
Servipak® Protection Board

CREDITS

Client: Qatar Petroleum
Architects: I.M. Pei (USA)
Structural Engineer: LERA (USA)
Contractors: SixConstruct - Midmac JV
Contractors, Baytur Contractor
Project Manager: Turner

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