

Doha Metro Qatar



View of station construction

The Project

The multi-billion dollar Doha Metro system in Qatar, is one of the largest metro projects in the world. Scheduled for completion in 2026, the Doha Metro network will consist of four lines and around 100 stations covering the greater Doha area, connecting major residential, commercial, and industrial zones.

To be built in two phases; phase 1 is expected to be completed in 2019, and will include the construction of two of the major stations at Msheireb and Education City, as well as over 30 other stations.

The second phase is scheduled to be delivered by 2026 with over 50 more stations to be developed.

The Challenge

Contractors for the Doha Metro system were taking no chances when it came to selecting a reliable and high-quality waterproofing construction product.

In Doha, any waterproofing membrane must succeed against demanding conditions: ground water, an average annual temperature of 32°C, and, critically, the presence of chlorides and sulphates, which attack the reinforcement and the concrete, respectively. The construction specifications state that the stations must remain completely dry throughout a 120-year design life.

The Solution

Four out of five winning contractors chose Preprufe® Plus, based on both the product performance and the reputation of Grace in the region. A fully bonded waterproofing membrane from Grace Construction Products, this innovative system is installed before the concrete is poured and bonds to the structural concrete, preventing water tracking behind the waterproofing layer or problems caused by ground movements.

Grace is supplying more than 1 million square metres of membrane for four of the five underground contracts, including the contract to construct the major downtown intersection station at Msheireb.

“We chose Grace products based on two main factors. First, reliability and knowing the products, and second, ease of use.”

Constantinos Demetriades, project director for Aktor, which is leading a joint venture (JV) to deliver the metro's Gold Line.

The JV did consider other systems during the tender (bid) phase, but chose Grace because it reduced the potential risk, explained Demetriades. Unreliable subcontractors

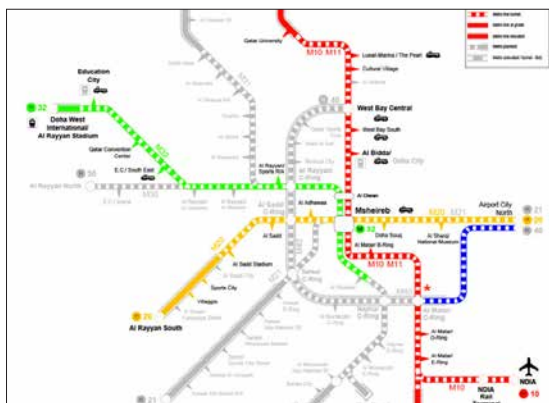
often put projects at risk in Qatar, but since Aktor's workforce has been trained to apply Grace products, workers can step in and keep the build on track. Preprufe® Plus, the second generation of Preprufe®, was launched in early 2014. The product's patented adhesive properties allow it to bond to concrete but not to foot traffic or debris. Preprufe® Plus also has double adhesive "ZipLaps™," which provide a more robust lap between adjacent sheets.

Preprufe® Plus is being used mostly below the bases of the stations and for the walls in some locations, such as where they are cast onto diaphragm walls. Grace's Bituthene® 8000 HC is also a part of the waterproofing system and is being used where the outside of the walls can be accessed after striking formwork.

Because Preprufe® Plus bonds to the concrete, the risk of water seepage is minimized. With some membranes, water can leak through potential defects in installation and track behind it, migrating to other parts of the structure.

One of the important elements for the station waterproofing is getting the detailing right. Grace can draw upon a vast library of details gained over the past two decades while installing over 50 million square metres of Preprufe® globally.

Grace has recently been developing details for Msheireb Station, which will be situated at the heart of the Doha metro system where three lines intersect. Grace knows this area well, having worked on basements in the major Msheireb Downtown Doha development since 2010.



PRODUCTS USED

Preprufe® Plus
Bituthene® 8000 HC
Primer B1
Grace Protection
Preprufe® CJ Tape
Serviseal® Wide Joint PVC Waterstops
Bituthene® LM
Adcor® 500T
Preprufe® Tape HC
Re-injecto

CREDITS

Owner: Qatar Rail Company

Gold Line

Consultants: Arcadis Group, Atkins

PMC: Louis Berger, Egis JV

Main Contractors: Aktor, Yapi Merkezi, Larsen & Toubro, STFA, Al Jaber Engineering JV

Green Line

Consultants: SSF Group, Turner & Townsend

PMC: Hill International

Main Contractors: Saudi Binladin Group, HBK Contracting Company WLL, Porr Solutions JV

Main Station: Msheireb

Consultants: Atkins, DB International, Louis Berger / Egis JV, Mott MacDonald, Turner & Townsend, Woods Bagot

PMC: Bechtel Corporation, Fluor Corporation, Parsons Brinckerhoff

Main Contractors: Samsung C&T, OHL, Qatar Building Co JV

Red Line South

Consultant: DB International, Intalferr

PMC: Jacobs

Main Contractors: QDVC, GS E&C, Al Darwish Engineering JV

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Detailed map of the Doha Metro

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