

# Saudi Arabian Rail System Uses GCP Waterproofing Solutions

PREPRUFE® and BITUTHENE® waterproofing protect the Haramain Railway Stations

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Project	Haramain Railway Stations, Saudi Arabia
Client	Saudi Railways Organisation
Architects	Foster & Partners & Buro Happold
Engineers	Buro Happold, Dar Al-Handasah
GCP Solutions	PREPRUFE® waterproofing, BITUTHENE® waterproofing

## Project Profile

### Building a railway in extreme conditions

Linking the holy cities of Saudi Arabia, the Haramain High Speed Railway is one of the largest transport infrastructure projects in the Middle East. The project team faced numerous challenges, including extreme heat and desert conditions, as well as the need to build four new stations in just four years.

Designed by the joint venture team of Foster + Partners and Buro Happold, in collaboration with local architect, Dar Al-Handasah, this 450 km-high speed rail system links Mecca and Medina to King Abdullah Economic City as well as to the coastal city of Jeddah, a key entry point for millions of pilgrims.

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## Waterproofing a vast rail system

Covering an area more than 30 times the size of London's Trafalgar Square, the four stations were built on a fast-track program. However, aggressive ground conditions and high water tables presented challenges. To meet those challenges, the high performance PREPRUFE® waterproofing membrane was used to protect against the destructive effects of groundwater. It provided exceptional transport business protection to all below grade built elements up to levels above the water table in extreme desert conditions.

To further minimize risk and ensure continuity, BITUTHENE®8000 HC waterproofing membrane was specified to provide complete protection for the substructure walls. In total, the stations used a staggering 300,000 m<sup>2</sup> of PREPRUFE®300R and 150,000 m<sup>2</sup> of BITUTHENE®8000 HC.

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## Choosing a proven waterproofing solution

"The GCP PREPRUFE®300R and BITUTHENE®8000 HC membranes had considerable benefits as the waterproofing solution for the station in Jeddah," commented Hussein Ali Khodr, project manager at Rawabi Specialized Contracting. "The nature of the transportation infrastructure project and the city stipulated the usage of proven, state-of-the-art technology. The simplicity and flexibility of installation lead to noticeable savings on engineering man hours."

Designed with synthetic adhesive layers combined with a robust HDPE film, PREPRUFE® membrane provided a permanent physical vapor barrier that protects each structure against chloride and sulfate attack. Unlike other waterproofing solutions, PREPRUFE® ensured the structure remain unaffected by salt and sulphate attack, even if their concentration changes over time.

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