

London Crossrail Transport Stations Receive Superior Waterproofing Solution



Project	Crossrail Stations
Owner	Crossrail
Tottenham Court Road	BBMV (a consortium of Balfour Beatty, Alpine BeMo Tunnelling, Morgan Sindall and Vinci Construction)
Contractor	
Liverpool Street Contractor	Engineers Mott Macdonald/Arup and contractor Laing O'Rourke
Canary Wharf Contractors	Canary Wharf Contractors Limited
GCP Solution	Preprufe [®] waterproofing

The Overview

The Project

Crossrail is one of the UK's largest and most complex construction projects. Crossrail is expected to transform the transportation rail network in London and the South East, reducing journey times and increasing rail capacity in central London by 10%.

Since work commenced in May 2009, 42 kilometers (26 miles) of new tunnels have been constructed beneath the streets of London, reaching depths of 30 metres. There will be 40 stations in total providing services for Crossrail passengers.

As part of the transport construction, the new £1 billion Tottenham Court Road Station, £300 million Liverpool Street station, and £500 million Canary Wharf Crossrail station required waterproofing membranes to ensure that each site remained watertight.



"Specified and installed at some of the most challenging waterproofing projects worldwide, Preprufe® proved the perfect system for lead designer Arup and contractor Expanded Piling, a subsidiary of Laing O'Rourke. No other system on the market better protects a substructure from the harmful effects of water, vapour and gas than Preprufe®."

The Challenge



The new Crossrail station at Tottenham Court Road is the length of four football pitches and three stories underground. The Liverpool Street station includes two new ticket halls, as well as a 40 metre deep shaft to accommodate ventilation, electrical, mechanical and systems equipment for the station in one of the busiest parts of London. Both transport stations required a high-level of reliable waterproofing, particularly for confined spaces.

Construction of the new Canary Wharf station has proven a complex engineering, technical and logistical challenge—including extracting 100 million litres of dock water. After draining the site and constructing a deep anchored cofferdam to provide a dry work environment, the next key step on the critical path was waterproofing.

The Solution

For the Tottenham Court Road Station, more than 2000 m² of GCP's PREPRUFE[®] waterproofing membrane delivered the high level of required watertightness for this transportation project.

For the Liverpool Street station, over 5000 m² of PREPRUFE[®] waterproofing membrane provided exceptional water tightness, below ground protection and proven performance.

At the Canary Wharf Crossrail station, 6,000 m² of PREPRUFE[®] waterproofing membrane ensured the site remained watertight – holding back up to 10 metres of Thames dock water.

With long term waterproofing performance, reliability and success at high-profile projects worldwide – PREPRUFE[®] membrane offered the perfect solution to ensure waterproof protection for these transport stations. PREPRUFE[®] was also chosen for its ease of application and speed.

Why PREPRUFE® Waterproofing?

PREPRUFE® was the obvious choice for its reputation in providing a reliable waterproofing solution, preventing water ingress through and around the base slab. Its patented ADVANCED BOND TECHNOLOGY™ enables concrete to aggressively adhere to PREPRUFE®, forming a unique intimate seal which prevents any water migration between the waterproofing and the structure, substantially reducing the risk of leaks.

Utilising an advanced acrylic surface coating, the PREPRUFE® membrane also simplifies the installation process by removing multiple layers and complicated detailing, reducing the depth of excavation and spoil, whilst the number of materials to be sourced are minimised, all accelerating the critical path of the project programme and ensuring the transportation project was delivered on time.



The Complete Waterproofing Solution

GCP Applied Technologies offered best waterproofing solutions providing continuity at the critical aspects of the project. A full package was delivered consisting of SILCOR® liquid waterproofing membranes, ADPRUFE® integral concrete waterproofing system and a full range of ADCOR® hydrophilic and PVC waterstops available for concrete joint protection.

GCP also provided comprehensive waterproofing solutions for the other critical transport stations, including Bond Street, Farringdon, Whitechapel, Pudding Mill Lane and Custom House.

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