

# Duo Towers – Paris Rive Gauche

PREPRUFE® Plus pre-applied waterproofing for an integrated underground structure

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Project	DUO Towers project
Architect	JEAN NOUVEL workshops
Client	Vinci Construction France
GCP Solutions	PREPRUFE® Plus, DE NEEF®, OMNITEK™, AQUATEK™

# Project

## Solving waterproofing challenges for integrated buried structures where traditional tanking solutions are not suitable.

Vinci Construction France sought to provide a reliable waterproofing solution for the DUO Towers project. The original plan was for traditional tanking using crystallised waterproofing, but this solution was ruled out. As often happens in dense urban settings, underground construction is designed as an integrated structure. The retaining wall in the excavation serves as a permanent wall around the structure and the slab is poured inside it. However, traditional tanking, such as crystallisation, cannot withstand cracking of the material and so it is not suited to this type of structure.

The DUO Towers project was no exception. This project, located in the Paris Rive Gauche (Left Bank) development zone in the 13th arrondissement, consists of two high-rise blocks for office, retail and hotel use. The two blocks stand on a shared substructure almost 30 metres in depth with 9 underground levels intended for technical facilities and car parking. The foundations consist of an enclosed slab, anchored within the diaphragm walls serving as a retaining wall and permanent cut-off wall for the facility areas.

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## The PREPRUFE® Plus pre-applied waterproofing solution

Following its positive experience using GCP waterproofing products for the La Courneuve Cash Centre in Île de France region, Mr. Roger Bail of FCT Vinci Construction France approached GCP Applied Technologies for a waterproofing solution for the DUO Towers project.

The PREPRUFE® Plus system was selected. Developed with GCP's patented Advanced Bond Technology™, the adhesive waterproof geo-composite membrane protects the slab with a waterproof lining for the walls, forming a water-tight bond to the concrete. This ensures lasting adherence to the concrete and eliminates the risk of water migrating between the waterproofing membrane and the structure.

The properties of the PREPRUFE® Plus membrane allow for crack bridging and long-lasting protection, even under high hydrostatic pressure. This helps prevent water infiltration and corrosion of the steel rebar in the slab.

*"We wanted a solution that met our contractual obligations, with a controlled risk for the waterproofing of the slab, which did not allow a traditional coating as crystallization. With the PREPRUFE® PLUS waterproofing system from GCP Applied Technologies, we found the right basement waterproofing solution. Moreover, its implementation, subject to serious preparation, is flexible and relatively fast, while the complementary products of the system make it possible to treat the singular points. Finally, thanks to the saving of the steels with the optimised crack width design of the RC structure, the impact on our budget could be limited."*

Christophe Tatin, Study Director of DUO TOURS for BATEG / Vinci Construction France.

## Waterproofing Solution

In order to offer a comprehensive solution for the project, a joint analysis of the requirements and risks involved was conducted by Vinci Construction France and GCP Applied Technologies.

The ground survey reports revealed a water pressure head of 26.50m and the need to create a gap under the slab. The foundation includes the barrette heads working in traction and compression, as well as the pile caps and sumps. It also features the wet wells and earthing rods running through the waterproofing, an expansion joint between the DUO 1 and DUO 2 blocks and bond between the PREPRUFE®Plus membrane and the diaphragm wall.

GCP's innovative products made it possible to cope with these constraints. The PREPRUFE®Plus system was used in conjunction with GCP's DE NEEF®leak sealing technology, OMNITEK™ RM fibre repair mortar and the AQUATEK™ elastic 2C flexible waterproofing coating; this combination has been successfully tested to a level of 210 m for resistance to negative pressure under NF P18-855.

A technical dossier was drawn up and was subject to a type B Technical Experimentation Assessment (ATEX) by the CSTB, the Scientific and Technical Centre for Building.

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