Subway Architecture Design in Seoul Calls for GCP Products

Seoul Metro utilises PREPRUFE® 300R and BITUTHENE® 3000 to solve waterproofing issue

Project	Seoul Metro Line 0
Client	Seoul Metro
Main Contractor	Chung Suk Engineering
Consultant	Global Specifications Consultant
GCP Solutions	Preprufe® 300R pre-applied waterproofing, Bituthene® 3000 waterproofing

The Overview

The Project

Seoul, the capital city of South Korea and home to some 11 million inhabitants, is a large city by any measure. To cater to the transport needs of its mushrooming population, the Seoul metro network was extended and a new line, Line 9, has been added. Construction of the Seoul Metro Line 9 started in 2003, and links Gimpo airport in western Seoul to Gangnam business district in southern Seoul. Section 1 is 25.5km long, with 25 stations including 13 interchange stations.

"The most important factor for choosing Preprufe® was the fact that it fully bonds directly to the concrete structure, without any chemical reaction, and it prevents water migration between the concrete structure and waterproofing product."

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Kim Jae Hyuk, Vice President, Chung Suk Engineering

The Challenge

A major transfer point of Line 9 Section 1 is Dangsan Station, which allows commuters to transfer to Line 2. An underground station, it sits underneath a roadway in the old city centre of Seoul. The confined tunnel construction space, due to its location within the business district, presented challenges for waterproofing design.

Kim Jae Hyuk, Vice President of Chung Suk Engineering, explained the challenges the architect team faced regarding this below grade waterproofing decision: "The diaphragm wall was designed as the soil retention system in most parts of this project. The greatest concern was to ensure positive/blind side waterproofing application for this continuous wall system. In fact, the Bentonite system had been considered for waterproofing before GCP's PREPRUFE®was introduced".

The Solutions

Working with Chung Suk Engineering to gain understanding of the project requirements and concerns, the team at GCP put together a waterproofing solution proposal to address those concerns.

S. J. Oh, then Global Specifications Consultant at GCP Korea, explained why a fully bonded system is critical for positive/blind side waterproofing.

"When structures are constructed below ground, they are subject to water pressure. In the case of positive waterproofing, the water pressure will be coming externally against the membrane on the structural foundation. When waterproofing membranes are not fully bonded to the structure, all it takes is a single leakage to cause water ingress and extensive damage".

Choosing PREPRUFE®

“We considered all the project requirements and proposed a waterproofing system that included PREPRUFE®300R waterproofing membrane for the substructure, BITUTHENE®3000 waterproofing membrane for above ground slabs and vertical walls (cut and cover portion), and SERVIPAK®3 as protection board system”, explained Oh.

When the Chung Suk Engineering team visited the rapid public transport project's construction site, the fast and easy installation of the PREPRUFE®waterproofing membrane system was also evident. PREPRUFE®was applied on wet concrete and was immediately trafficable after installation, which was a tremendous aid to the construction schedule.

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