

INTEGRITANK[®] waterproofing chosen for Mexico tunnel project

Coatzacoalcos Tunnel protected with spray-applied waterproofing membrane



Project	Coatzacoalcos Tunnel, Mexico
Client	State Government of Veracruz, Coatzacoalcos City Hall, Banobras FinFra
Contractor & Consultant	Constructora Túnel Coatzacoalcos, Fomento De Construcciones Y Contratas, Construcción Infraestructuras Y Filiales De México, Grupo OPC
Authorized Contractor (Waterproofing Applicator)	Venture Waterproofing Construction (USA)
GCP Solutions	INTEGRITANK [®] Waterproofing System

Project

Underground tunnel built below the riverbed

The 1km immersed tube tunnel under the Rio Coatzacoalcos in Mexico links the city centre with the Allende district on the east side of the river. It is part of an overall 2.2km four-lane road construction project, designed to improve transport links across the river.

The tunnel was constructed out of reinforced concrete, using pre-tensioned concrete caissons. It consisted of six separate sections. Pre-fabricated in a dry dock, they were towed out to the immersion site and sunk into the riverbed to a depth of 30m below sea level, before being connected.

Challenge

INTEGRITANK[®] system outperforms the competition

Given the permanent immersion in aggressive salt water and the challenge of producing a crack-free concrete structure, project design engineers TEC and general contractor Constructura Tunel de Coatzacoalcos were keen to trial a number of potential waterproofing solutions onsite prior to commencement of the waterproofing of the tunnel itself.

They evaluated numerous spray-applied waterproofing products, including INTEGRITANK[®] system from Stirling Lloyd (now GCP Technologies). The products were used on trial panels in a side-by-side performance comparison over a period of two years. The panels were rigorously tested under exacting in-situ conditions, including UV, high humidity and a broad range of temperatures. Some of the competitive products had pinhole defects develop that could not be satisfactorily addressed, but the INTEGRITANK[®] system showed no such flaws, and exhibited exemplary performance characteristics throughout.

"A product trial on this scale ahead of the actual project commencement is unusual, but we were happy to prove ourselves against the competition"

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Stirling Lloyd Vice President of US Sales Tom Carter

Solution

Advanced waterproofing stands up to rigorous testing

Based on unique ESSELAC[®] advanced resin technology, the INTEGRITANK[®] system is a high performance, fully bonded, two-coat system that is spray applied to tunnel surfaces where it cures rapidly to form a tough and seamless waterproofing membrane. Since the INTEGRITANK[®] system is capable of being applied in a broad range of temperatures and climates, the highly humidity in Mexico presented no problem for the system.

However, it was the ability of INTEGRITANK[®] to bridge cracks, together with its cost-effectiveness, that most interested the contractor.

The INTEGRITANK[®] system was applied to more than 28,000m² of the tunnel's external surface while in dry dock to provide a watertight, chloride-resistant, flexible and protective barrier against water ingress. Once cured, holiday detection tests were conducted to confirm the waterproofing integrity of the membrane and, prior to permanent immersion, flood testing was carried out in the casting yard to test the buoyancy and water tightness of the tunnel elements.

The final waterproofed section was successfully immersed under the river in March 2013, creating a new and strategically important transport link for the region's local oil refinery infrastructure.

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