CASE STUDY

JFK Airport Underground Pedestrian Tunnel, American Airlines Terminal 8

New York, United States (2004)

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BACKGROUND

In 1999, American Airlines began construction on a $1.4 billion, 2.2-million-square-foot terminal complex to replace Terminals 8 and 9 at New York's JFK Airport. Completed in 2007 the complex now serves domestic and international passengers on three concourses, and includes a customs and immigrations facility, a 10,000 square-foot retail and concession space, and a new 1,900-space parking garage. To allow for uninterrupted passenger service, the complex was built in four stages.

Part of the terminal construction involved building a new 1,500-foot-long, 150-foot wide concrete pedestrian tunnel, which runs 25 feet below finished grade with a water height of 12 feet at high tide. During the original construction of the tunnel, conventional PVC Waterstop and membranes were used to waterproof the structure.

Before long, however, shrinkage cracks began to form and, they along with the cold joints and construction joints in the walls and floors began to leak. Over the next 18 months, the foundation contractor tried numerous solutions to fill the cracks and stop the leakage. Despite spending many thousands on repairs solutions, the cracks continued to grow and the tunnel continued to leak.

SOLUTION

After a number of failed repair attempts, the foundation contractor contacted the Crystal Group, a Kryton distributor in New York. The Crystal Group offered to undertake a 50-foot test repair using Krystol T1 & T2 Waterproofing System and Krystol Crack Repair System.

Krystol T1 & T2 Waterproofing System is a cementitious mixture that can be brush-applied to existing concrete structures to repair cracks, fortify and waterproof the concrete and protect it against contamination and steel reinforcement corrosion. After application, chemicals from Krystol T1 & T2

OWNER:
American Airlines

ARCHITECT:
DMJM Harris

CONTRACTOR:
VRH Torcon

REPAIR CONTRACTOR:
The Crystal Group, LLC

PRODUCTS:
Learn more at **kryton.com**
Krystol® Crack Repair System
Krystol T1®/T2®

The $ 1.4 Billion complex serves domestic and international passengers on three concourses.

Kryton International Inc.
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are absorbed into the concrete by the natural wicking action of concrete. Once inside the concrete, the chemicals cause crystals to grow, self-sealing cracks and filling the spaces between concrete particles, permanently blocking the movement of water in all directions.

The active Krystol chemicals will migrate deep into the pores and capillaries of the concrete. Because of this deep penetration, with time the initial surface coating of Krystol T1 & T2 can actually be removed without impacting the waterproofing properties that the Krystol Products have brought to the wall. Krystol T1 & T2 can be applied to positive or negative surfaces where access to outside walls may difficult or impossible.

Once the 50-foot test repair proved watertight, the project team gave the go ahead for full repairs to begin. The repair team began by grinding out the cracks and joints to remove the epoxy and other materials that had been used in an attempt to stop the leakage. Honeycombed sections where air had not entrained properly were also chipped out. The Krystol T1 & T2 system was applied on all cracks and joints successfully. Even cracks greater than 0.75 mm were able to self-seal when allowed adequate time for crystal growth to occur.

After shrinkage cracks and cold and construction joints were repaired, the Crystal Group used Krystol T1 & T2 to repair a shifting armour joint, which connected two 500-foot concrete tunnel sections. The 87 feet of repairs were made more difficult by freezing temperatures and continuous flow of 40-degree ground water at 15 PSD. Furthermore, the JFK project team wanted to pressure-test the repairs just 7 days after completion, which is earlier than recommended. Despite the adverse conditions and shortened timeframe, the test was successful and the armour joint proved watertight.

The Crystal Group completed the JFK repair project in March 2004 and to date the concrete pedestrian tunnel remains problem free.

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