



At the Lab. In the Field.
By Your Side.

YVR (VANCOUVER) AIRPORT TUNNEL

Vancouver, BC, Canada



CONCRETE
WATERPROOFING

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QUESTIONS: 1-800-267-8280 or www.kryton.com

BACKGROUND

Vancouver International Airport (YVR) is Canada's second busiest airport and North America's second largest international passenger gateway on the West Coast with over 16 million passengers each year. YVR is located in Richmond, a suburb of Vancouver, at the mouth of the Fraser River, where the highest land point is six feet above sea level.

To meet its accelerating growth (21 million passengers by 2010), YVR has embarked upon a \$200-million expansion of the International Terminal that includes 29,958 square metres of new airport space, waiting areas, duty-free shops, services, and dining areas. The project also includes a baggage tunnel to be built underground, connecting the new terminal with the existing terminal. The underground tunnel created a significant challenge for the contractor due to the high water table.

Originally, specifications for the underground tunnel required that the tunnel be wrapped in a roofing membrane. The contractor, however, was concerned that the membrane might leak or be damaged while crews built the slab and walls. The original specifications also necessitated that the concrete cure for 28 days before the membrane could be applied. This curing period would mean an increase in the tunnel's construction time of more than two months, delaying both the backfilling of the area and the structural steel installation on the top of the tunnel.



Above: Savings of over 50% of the cost of the originally specified membrane.



Above: Krystol Waterstop application to all the construction joints.



Left: Expansion project of the Vancouver International Airport includes airport space, waiting areas, duty-free shops, services and dining areas, and a baggage tunnel.

PROJECT CASESTUDY

The Kryton Group of Companies.

1645 East Kent Avenue, Vancouver, BC Canada V5P 2S8 Tel.: 1-604-324-8280 Toll Free: 1-800-267-8280 Fax: 1-604-324-8899 E-mail: info@kryton.com Web: www.kryton.com

SOLUTION

The contractor, PCL, recommended Kryton's Krystol® concrete waterproofing system to waterproof the tunnel and to ensure that the ambitious schedule would be maintained. The world's only permanent, in-depth, surface-applied waterproofing system, the Krystol® concrete waterproofing system is a cementitious, chemically reactive treatment that turns existing concrete into a permanent and powerful waterproof barrier.

When added to the mix, Krystol's crystalline chemicals grow millions of needle-like crystals throughout the concrete matrix, becoming a permanent part of the structure. Permanently blocking the movement of water in all directions. These crystals remain dormant until another crack forms, at which time they will react with incoming water to self-seal the crack and maintain a watertight seal.

The Krystol® concrete waterproofing system for the YVR project includes:

Waterproofing Admixture - Krystol Internal Membrane™ (KIM®) was added to the concrete mix to pour the slab, walls and roof of the tunnel. KIM® is the original crystalline concrete waterproofing admixture, and the first to be available in pulpable bags for easy addition.

Joint Design - Krystol Waterstop System™ was applied to all the construction joints. The system replaces PVC and bentonite in joints by providing both physical and chemical waterproofing barriers,

Key factors in the YVR team's decision to use the Krystol® concrete waterproofing system:

Ease of application – Minimal labour required to add KIM® to concrete mix and effect joint waterproofing.

Speed – Eliminating the need for external waterproofing membranes meant less steps involved in the waterproofing application and the ability to backfill as soon as the forms were stripped. Also, because KIM® is added right to the concrete mix, no on-site preparation work is required.

Permanent System - Unlike external membranes, which are best on the day they are applied, Krystol® does not deteriorate over time. It does not become brittle, will not wear away, crack, peel or separate at the seams.

The Krystol® concrete waterproofing system saved one month in construction time and reduced material/application costs by more than 50% over the originally specified membrane system.

Tunnel specifications: 4.5m wide x 2.5m tall x 35m long
Slab thickness: Floor 300mm, Walls 350mm, Roof 355mm
Total amount of KIM-treated concrete for the project: 340 cubic metres

OWNER

YVR (Vancouver) Airport Authority

CONTRACTOR/APPLICATOR

PCL

ENGINEER

Bush, Bohlman & Partners

ARCHITECT

Stantec

DISTRIBUTOR

Fairwind Construction Supplies

READY MIX

Ocean Construction Supplies



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