

# Montreal Museum of Fine Arts Expansion

Montreal, QC, Canada (1991)

PRODUCT USED:

**Krytol Internal Membrane™ (KIM®)**

## OWNER:

Montreal Museum of Fine Arts

## ARCHITECT:

Moshe Safdie

## READY-MIX SUPPLIER:

Lafarge

## BACKGROUND

As the oldest art museum in Canada, the Montreal Museum of Fine Arts has seen multiple expansions since its inception in 1860. By 1986, the museum was soon preparing to see the third of these expansions. This was a product of the hopes held by the museum's president of board of directors at the time, Bernard Lamarre. Hoping to help the museum garner international influence, Lamarre partnered with Paul Desmarais, a financier and philanthropist; Jean Doré, the mayor of Montreal back then; and many other influential individuals to develop a new pavilion for the museum on the south side of Sherbrooke Street.

That collaboration eventually culminated in contracting the architect Moshe Safdie, who had recently been named as an Officer of the Order of Canada. Under Safdie's direction, the new pavilion would retain the 130-foot-long, 65-foot-high (40-meter-long, 20-meter-high) façade walls of the New Sherbrooke Apartments and remove the rest to make way for a massive portico that would lead into a glass-roofed lobby. It would create a mix of modern and past designs, forming an airy, contemporary environment with an appearance that still reflected the heritage style of the buildings nearby.

Worth \$53 million, this project would be extensive, covering 22,419 m<sup>2</sup> (241,320 ft<sup>2</sup>).

It would also come with some challenges. For one, the old façade walls needed to be integrated with the newer ones, which required excavation that would make it impossible to externally access the concrete walls that needed waterproofing. On top of that, all of this work would be done on a street with multiple main aqueduct and sewer pipes running underneath it. That posed a greater risk for water ingress damaging the structure and the many priceless pieces of art it would hold if the waterproofing wasn't applied effectively.

## SOLUTION

To find a watertight solution to counter these challenges, Safdie consulted three engineering firms: Martineau Vallee Regimbald, Gascon Vigneault Dumais, and Dionne Olechnowicz. In response, each firm recommended the use of the only known product to have crystalline waterproofing technology at the time: KIM.



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As the first crystalline waterproofing admixture ever developed, KIM offered the Montreal Museum of Fine Arts a groundbreaking way to waterproof their concrete. Unlike external membranes, KIM wouldn't require a lot of time or labor to apply. And most importantly, it wouldn't need to be applied externally. Its sole requirement was that it needed to be added to the concrete mix during batching.

From there, the concrete in its entirety would become its own waterproof barrier. This is made possible because when added to the concrete mix, KIM permeates the concrete with its Krytol® technology, ensuring that the concrete can chemically react to the presence of water and unhydrated cement particles. This reaction then forms solid interlocking crystals that fill up the capillary pores and micro-cracks of the concrete. That blocks out any pathways for water or waterborne contaminants to get through and makes the concrete capable of self-sealing any hairline cracks that might occur. It's a reaction that persists throughout the life span of the concrete, making this protection permanent.

After hearing about these benefits, Safdie realized that this process would eliminate the need for external membranes and a surface-applied form of waterproofing entirely while also speeding up the waterproofing process and reducing its cost. At the same time, it would still provide the museum's new pavilion with the watertight protection it needed.

With that in mind, Safdie and the rest of the museum's construction team were confident in applying KIM. As a result, they had the ready-mix supplier Lafarge add KIM to their concrete mix.

That led to them successfully expanding the museum in a way that kept it watertight and had the director of Lafarge's La Haute-Yamaska territory, François Roy, noting that "the results in all applications were simply excellent."

