

Maley Dam Restoration

Sudbury, ON, Canada (2020)

PRODUCTS USED:

Krytol Internal Membrane™ (KIM®) Krytol T1®

OWNER:

Province of Ontario

ENGINEER:

AECOM

CONTRACTOR/APPLICATOR:

Dominion Construction

READY-MIX SUPPLIER:

Rainbow Ready Mix

DISTRIBUTOR:

Form & Build Supply

BACKGROUND

Flooding is a common risk in most parts of Sudbury, Ontario, making safety and structural protection there a critical concern. Over the years, the Province of Ontario has responded to that concern with a number of flood mitigation methods. One in particular included the construction of the Maley Dam in 1971.

Designed to control flooding, the dam would catch any additional oncoming water, ensuring that it wouldn't flow over so severely. However, over time, the dam started to show signs of wear. Eventually, one of its side walls had heavily deteriorated.

If left alone, this deterioration would have only continued until Sudbury lost some of its flood protection. Realizing that, the Province of Ontario chose to restore the dam, extending its life span from its existing 50 years to 100 years at the cost of \$8.8 million. However, the restoration had a tight schedule and would need to contend with winter weather.

SOLUTION

While restoring this dam was important to the province, the restoration team had to wait until late in the fall season to start. Otherwise, the water levels in the area would have been dangerously high, increasing the risk of damage to the worksite and its workers.

Because of that later start, the team had to prevent the ground around the dam from freezing. If they didn't, the ground would have eventually thawed and settled, which would have created cracks in the team's freshly poured concrete. With that in mind, the team planned to keep the area unfrozen with a heating and hoarding process.



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Before that could even start, however, the contractor had to determine just how they could increase the longevity and durability of the dam's spillway and structural side walls. Initially, they had considered cementitious coatings. But those were rejected for their inability to protect or extend the life span of the Maley Dam significantly.

Instead, the contractor turned to Kryton's KIM and Krytol T1 solutions. Both of which offered the restoration team the ability to use Krytol® technology, which has been proven to last for the life of any given concrete structure and to give that structure better durability and long-term waterproofing. The team would just need to add KIM to the concrete mix and apply Krytol T1 to the surface of the concrete.

From there, the concrete would receive Krytol technology, which remains dormant until water is present. Once water tries to seep through the concrete, the Krytol technology will activate, forming interlocking crystals that fill up capillaries, pores, and micro-cracks in the concrete. That stops water from passing through the concrete and corroding the reinforcing steel within. It also allows the concrete to self-seal hairline cracks, mitigating the need for future repairs.

In short, it was exactly what Maley Dam would need to stay structurally strong for another 50 years while withstanding the occasional high water levels. Knowing that, the restoration team started applying the two solutions. As a result, they added 300 m³ (10,594 ft³) of KIM to the concrete mix to help reinforce the one heavily deteriorated side wall. Through the use of one-sided forming, they then cast in place the KIM-treated concrete and anchored it to that wall. Then, to protect the spillway and other structural side walls, the restoration team coated those areas with 1,672 m² (18,000 ft²) of Krytol T1.

All of which was done efficiently within the tight construction schedule with the help of local distribution, easy product availability, and immediate site service and inspection, leaving the dam free to control floods effectively once more.

