

Seal Our Fate

Waterproofing products and systems are helping prolong the life of buildings and increasing their resilience against climate change

by ROBIN BRUNET



Park Square's pedway bridge in Edmonton, AB.

Just as death and taxes are inevitable, so too is the damage water ingress causes over time to even the most resilient structures. And from an engineering viewpoint, it is something that warrants constant attention. Enzo Vercillo, principal at RJC Edmonton's Building Science and Restoration Group, says, "The issue is always on our radar, and our job in the commercial realm is to assess client assets and make recommendations – a process that can take less than a day or up to several weeks, depending on the size of the project. We also, at all times, look for the most effective and economical solutions for clients, and this could be as simple as deck coatings on high-traffic areas.

"If we have an all-encompassing statement to make to property owners, it would be to get your structure checked on some sort of regular basis. This could be generally every year or every two years depending on its current condition and could apply to heavy-use areas such as parking structures, or once a year for some retail businesses and residential condominium corporations."

One example of the work RJC performs is the structural condition evaluation of Park Square's pedway bridge in Edmonton, which had been constructed in the mid-1970s. The evaluation revealed severe corrosion of the metal deck, in addition to corrosion of supporting structural steel joists and trusses.

After evaluating various methodologies, and considering the client's desire for long-term rehabilitation of the pedway bridge, it was recommended the entire composite concrete topping and metal deck assembly be removed and replaced. RJC incorporated numerous measures to maximize service life and future durability, including corrosion-inhibiting concrete admixtures and cementing materials, heavier-gage galvanized deck coatings, application of protective coatings to metal decking and structural steel members, improved drainage systems and surface slopes, and installation of a new waterproof membrane and expansion joints.

Localized repairs included reinforcement of support connections for structural steel support members and precast wall panels, concrete delamination repairs, and replacement of deteriorated concrete upstand walls. The project was completed in two phases in order to maintain pedestrian access and was within the owner's schedule and under budget.

While engineering firms such as RJC continue to excel in restoration work, many companies provide a variety of waterproofing technologies in the



Trowel application of Vandex BB 75.

perpetual battle against water-induced structural erosion and failure. One of the better known is Euclid Canada, and its national business development manager Brian Salazar reports that "we've been coping with raw materials shortages and supply chain issues by reformulating – and in many cases improving – our products, and this has worked out well. In terms of products that are widely used across Canada, Eucon Vandex AM-10 is used to integrally waterproof concrete in water treatment plants and many other facilities where its NSF rating makes it feasible for use in potable water situations."

Eucon Vandex AM-10 is an integral crystalline admixture specifically formulated to interact with concrete capillary pore structures for waterproofing that is a permanent part of the concrete matrix. It can be used in above- and below-grade applications.

For horizontal and vertical/overhead uses, Euclid offers Vandex BB 75, an engineered surface waterproof coating with hydrophobic properties that also

complies with NSF/ANSI 61 Standard and was tested to over 230 feet of hydrostatic pressure. It can be brush or spray applied to the positive or negative side of a concrete or masonry substrate, and while it is water and moisture resistant it allows structures to breathe via the passage of vapour. “The Vandex line is effective for a wide variety of waterproofing solutions,” says Salazar, adding that it has been recognized as a leading waterproofer in more than 70 countries.

Kryton International Inc. manufactures and globally distributes durability systems for concrete, including the award-winning Krystol Internal Membrane (KIM) and the integral concrete hardener Hard-Cem that increases abrasive and erosive wear resistance of ready-mix concrete, precast concrete, and shotcrete.

While individual Kryton products are effective in their own right, Kari Yuers, CEO, Kryton International, says: “In many situations it’s important that our products be used together as a comprehensive waterproofing system. One example is Vancouver’s North Shore Wastewater Treatment Plant, designed for a 160-year lifespan. For its high-risk areas and where congested rebar was used in construction, KIM was used along with Krystol T1, a surface applied crystalline slurry treatment, and Krystol Repair Grout.” Yuers adds that KIM was recently used in the Vancouver General Hospital expansion for waterproofing of the facility’s below-grade tunnels.

Krystol T1 lowers the permeability of the concrete to protect against the ingress of water and waterborne chemicals. Since it becomes integral to the concrete, it can be applied to either the positive or negative side of the water pressure, which allows reliable hydrostatic waterproofing protection and remediation for even the most difficult applications.

As part of the Krystol Leak Repair System, Krystol Repair Grout is a crystalline concrete waterproofing product that stops the flow of water to permanently repair leaking cracks, holes, and joints in concrete, and can also be used to resurface and waterproof defective, damaged or deteriorating concrete. The grout employs advanced fibre technology and shrinkage controlling additives to prevent cracking.

For 2022, Yuers says, “We’re putting emphasis on our Hard-Cem abrasion and erosion mixture as an adjunct to waterproofing because it doubles the life of concrete and can be blended with our waterproofing admixtures for many applications, including those at the water table.” When added to concrete, Hard-Cem’s proprietary technology increases the hardness of the concrete paste and reduces fine and coarse aggregate exposure that creates degradation to concrete surfaces. Since it is integral, it continues to offer surface wear resistance throughout its life and can be an important part of any carbon reduction strategy.”

For more than 50 years, Xypex Chemical Corporation has provided its concrete waterproofing products that use crystallization technology to a wide range of construction and renovation projects around the world. By means of diffusion, the reactive chemicals in Xypex products use water as a migrating medium to enter and travel down the capillaries of the concrete. This process precipitates a chemical reaction between Xypex, moisture, and the by-products of cement hydration, forming a new non-soluble crystalline structure. This integral structure fills the capillary tracts, rendering the concrete waterproof.

Chantell Segal, marketing director, Xypex Chemical Corporation, says: “In below-grade structures it is important to select a waterproofing system that fully protects the concrete from hydrostatic pressure, therefore ensuring the functionality of the interior. Xypex Crystalline Technology is a waterproofing solution that resists even extreme hydrostatic pressure. As it is added to the concrete at the time of batching it does not require installation on site, saving time and money, as well as removing an additional trade from the site. Using Xypex can add to the LEED points that the architect can obtain for the building.”

In 2022, Xypex reached a milestone that promises to further increase the company’s global prominence. “After several years of rigorous testing in collaboration with Deutsches Institut für Bautechnik, our Xypex Admix C-1000 NF became the only admixture product approved in Europe for resisting hydrostatic pressure. This has positive implications for us here in Canada, because in general there is a difficulty in understanding the distinction between water resistance for non-hydrostatic conditions and waterproofing for hydrostatic conditions. This European approval clearly designates Xypex as a waterproofing admixture suitable for below grade structures where water head pressure is expected,” Segal explains.

In a similar vein, Flexstone Coatings Inc., which is famous for its waterproof membranes (they are considered the most durable sundeck coatings on the market today), recently obtained a rating that will further the prominence of its products moving forward.

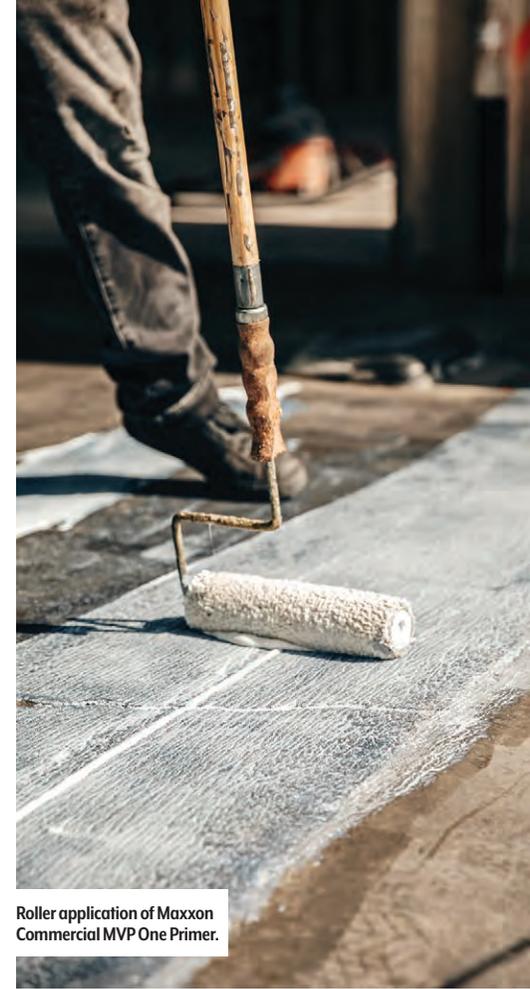
Demetre Christou, Flexstone’s operations manager, explains, “We received our Class B fire rating for applications on plywood surfaces and, when installed over concrete, a Class A rating for our membranes. This is extremely valuable to us considering we’ve experienced a lot of activity in Kelowna, Kamloops, and other regions of B.C. that suffer seasonal wildfires.”



Spray application of Krystol T1.



Flexstone’s four-ply rubberized membrane.



Roller application of Maxxon Commercial MVP One Primer.

Flexstone’s four-ply CCMC approved rubberized membrane relies on the foundation of its solvent-free base coat, which adheres to nearly any substrate (concrete, plywood, fibreglass, vinyl, urethane membranes, torch-on, and more) and retains its flexibility indefinitely. The base coat is installed thick with a v-notched trowel or squeegee. The finish coats are not only aesthetically gorgeous, their rugged mock-aggregate finishes also provide a tough but flexible outer shell that keeps the membrane safe from heavy traffic and UV damage.

As for supply chain issues, Christou reports that companies such as his are coping with raw materials price increases. “Last year’s price increases didn’t hurt because demand recovery was so strong, and so far this year the same holds true. Certainly, the renovation market that we cater to continues to boom.

“We’re cautiously optimistic about the future, even when it comes to the crazy fuel prices that have resulted in orders from places such as Arizona costing double the normal transportation costs. Our shippers tell us things will eventually return to normal, and as far as I’m concerned that will be good news.”

Meanwhile at Mapei, demand is continuing to grow for Mapelastix as an excellent flexible, cementitious waterproofing membrane for balconies and terraces. It has been said that the two-component flexible (down to -20 Celsius) mortar, which can even be applied on existing coverings, has sealed over 350-million square metres of bathrooms, pools, facades, bridges and canals, as well as balconies and terraces.

In addition to binders, Mapelastix is made of fine-grained selected aggregates, special admixtures, and synthetic polymers in dispersed water; when the two components are mixed together they form a smooth mix that is easy to trowel. Also, thanks to the high quality of components, a hardened layer of Mapelastix maintains its elasticity regardless of the surrounding conditions and is unaffected by the aggressive chemical action of de-icing salts, sulphates, chlorides, and carbon dioxide.

Last but hardly least, Maxxon Corporation provides a range of products for the construction industry, from gypsum underlayments to sound control and self-levelling floors, and in the realm of moisture mitigation it offers multiple solutions intended to eliminate one of the most vexing outcomes in flooring: floor failures due to moisture emissions in concrete construction.

Maxxon Commercial MVP One Moisture Mitigation Primer is a ready-to-use, zero-VOC moisture barrier and primer. When applied to concrete substrates, it mitigates moisture-related issues such as high MVER, RH, and pH. It is also an excellent primer for Maxxon underlayments and patches. Maxxon Commercial MVP One Primer is quick drying, allowing for rapid turnaround.

Maxxon Commercial MVP Two-Part Epoxy is a 100 percent solids epoxy coating specially designed for interior use over concrete with high moisture and/or pH levels. It manages moisture levels up to 100 percent RH and prevents alkalinity (up to pH 14) in concrete subfloors from negatively affecting adhesives, underlayments, and floor coverings. **A**