

Back To Life

Restoration products provide solutions and time-saving benefits to complex projects

by ROBIN BRUNET

It's no secret that 2020 was a busy year for restoration projects, especially in the residential sector for obvious reasons, but also in commercial/institutional venues across Canada.

Brian MacNeil, North American regional manager at Kryton International Inc., says, "Thankfully, concrete construction, including restoration, fell under essential services during the initial lockdowns, and our contractor network across Canada was busy throughout the year. To cite just one of our products, Krystol T1 is a crucial ingredient to the restoration of BC Hydro facilities, protection of in-ground water tanks for the BC Children's Hospital and the BC Women's Hospital + Health Centre, and many other projects."



Water tank protection upgrade, BC Children's Hospital and BC Women's Hospital + Health Centre, Vancouver, B.C.

For the Vancouver-based hospital, internal concrete water tanks to supply emergency drinking water and collect the hospital's wastewater had to be waterproofed. But because they were below grade with no access to the outside of the tanks, a typical waterproofing coating would not have worked on the interior of the concrete walls (it would be too prone to delamination).

After considering a polymer-modified cementitious coating, the construction team decided to use Kryton's Krystol T1, which would chemically react to water ingress with interlocking crystals that



Water treatment plant upgrade, City of Greensboro, NC.

could block any water pathways. For maximum protection, the team also added Kryton Krystol Internal Membrane (KIM) admixture directly to the concrete.

Kryton's waterproofing products, all of which employ the company's crystalline waterproofing technology, have grown in variety to the point where they can benefit any waterproofing project, as the City of Waterloo can testify: at first it considered using a brush-applied membrane for the Waterloo Memorial Recreation Complex elevator shaft, one component of a complex upgrade that needed to have exceptional structural and mechanical integrity.

But the pandemic, access to labour, a compressed construction schedule, and a strained budget com-

one of the more interesting recent infrastructure renovations for his company. The city had spent over \$14 million rehabilitating the Mitchell plant, whose concrete structures both indoors and out were badly deteriorated by ferric sulphate, lime slurry, sodium hypochlorite, and other chemicals. Paste erosion and freeze thaw damage left nearly two acres of basins with exposed aggregate and isolated large missing pieces.

A mortar was needed to replace the missing pieces and cover the aggregate, as well as provide waterproofing, vapour permeability, chemical protection, low shrinkage, and freeze/thaw protection – and it also had to be spray applied. The solution turned out to be Xypex's Megamix II repair mortar. As with



all other Xypex coating and repair products, Megamix II contains proprietary chemicals that react with the water in concrete and with the byproducts of cement hydration to generate a non-soluble crystalline formation in the pores and capillaries of concrete.

A Xypex technical team advised on proper prep, application, and finishing techniques, and 4,700 tons of the mortar was applied

throughout the basins, vertically as well as horizontally. A compressive strength of up to 7,700 psi was achieved at 28 days, and it is estimated that this repair project was five to 10 times less the cost of what it would have been to rebuild the basins.

Mapei is another company whose adhesives, sealants, and chemical products are crucial to the successful completion of restoration projects, and J.D. Eckmire, director of sales – Western Canada says, "We are constantly upgrading our product line and invest a lot of research and development to achieve better performance with our products."

elled the builders to use the KIM admixture plus Kryton's Krytonite Swelling Waterstop to ensure that the elevator shaft's joints would be protected from water ingress. These solutions saved considerable time and required a lot less labour, thus enabling the construction schedule to be accelerated.

Les Faure, advertising and promotion director at Xypex Chemical Corporation, believes "infrastructure renovation is something that will get a lot of attention in 2021."

Faure cites the upgrade of a water treatment plant in the City of Greensboro, North Carolina, as

Concrete slab restoration, Red River College, Winnipeg, MB.



For example, several years ago when Mapei improved its Planitop 12 to include sulphate resistance (hence, Planitop 12 SR, a vertical, overhead, and horizontal repair mortar with silica fume) this led to the product being integral to the success last fall of restoring a concrete slab in Red River College's trade school, which was undergoing renovation.

Eckmire says, "The concrete slab in the auto body shop had deteriorated quite a bit over the years and had poor sloping towards the drain. Following

extensive remediation work, Planitop 12 SR was used to resurface the slab and create a proper grade down to a new drain." Eckmire adds that Planitop12SR's fibre reinforcement helps to give the mortar exceptional tensile strength and control cracking.

Maxime Duzyk, director of building science and engineering, North America at Huntsman Building Solutions, discusses the potential growth in 2021 for his company's D-Max Wall application with Heatlok Soya HFO. "With the new energy efficiency requirements, the thickness of insulation is bound to increase, along with the construction costs," he says. "The D-Max wall assembly is a solution in the commercial market to keep a reasonable construction budget, while meeting the new requirements for effective R-value or U-value. It also creates a durable building envelope while having an ultra-low impact on global warming and being made out of recycled and renewable materials."

Instead of installing exterior sheeting directly on the steel studs, the D-Max method employs a Z girt installed horizontally on the studs, with sheeting installed on top of the girts. This allows the foam to insulate the space created between the studs and the sheeting, thus eliminating the thermal bridge. The product is also water resistant, so it does not matter if the product is exposed to water during construction.

When asked what specific type of projects the D-Max method is ideally suited for, Duzyk says, "The assembly is targeted at commercial construction. It has also been designed for high-rise projects with concrete structure, and we have completed

multi-residential condos and apartment projects that were initially not designed with this assembly."

Brian Salazar is another industry insider who views the restoration market as robust during the pandemic. The national business development manager at Euclid Canada says, "In recent years we deliberately tried to involve ourselves more in this sector, for the simple reason that many concrete structures are in need of repair and we can help provide efficient and durable solutions."


One product line from Euclid that is proving to be especially desirable for commercial restoration is the Level Top series, consisting of Level Top Stain (which can be coloured or stained within hours of placement and whose base colour cures to a light shade, making stain colours pop with a vibrancy not normally found in concrete); Level Top Polish (a high-strength overlay that may be polished 24 hours after placing for a brilliant, reflective shine); and Level Top PG AGG.

The latter product is a graded natural aggregate designed for use on either new or worn concrete substrates. It provides excellent adhesion and long-term durability and can be ground and polished to achieve the appearance of polished concrete with a salt and pepper look. In addition to the restoration of floors, it's perfect for cast-in-place concrete slabs or precast applications where a uniform appearance is desirable. "Restorers appreciate that a half-inch-thick application of this overlay provides upwards of 7,000 psi compared to 4,000 psi for normal concrete," says Salazar. "A recent restaurant restoration in Washington State highlighted its efficacy."


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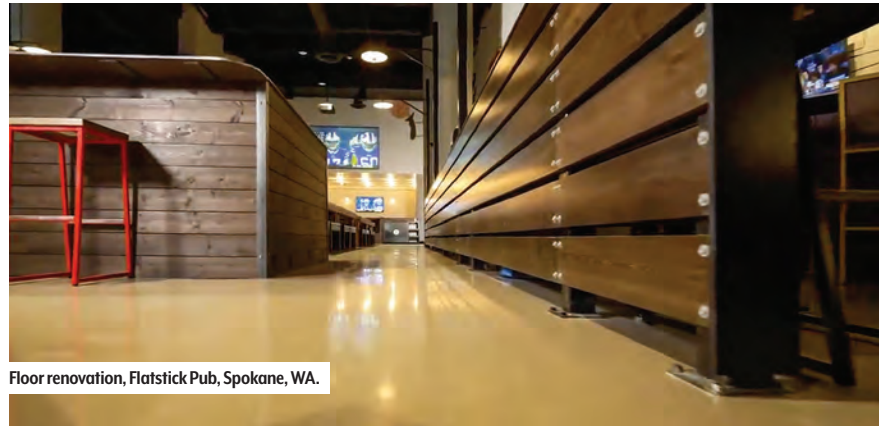
Level Top PC-Agg is an easy-to-use, self-leveling concrete floor topping and resurfacer with excellent adhesion, toughness, and long-term durability. Just 24 hours after installation, Level Top PC-Agg can be ground and polished to expose the fine aggregate and achieve the stunning appearance of polished concrete. Decorative aggregate and colors can be incorporated to create a variety of design possibilities.



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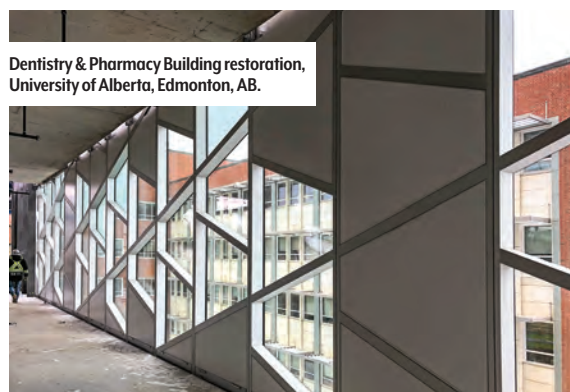
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Salazar is referring to the Flatstick Pub in Spokane, whose 50-year old floor was renovated with Level Top PC AGG. After only two days of prep, work crews were able to pour a 7,000-square-foot new floor in five hours. About 850 50-pound bags of material were used for the pour, and within 16 hours the grinding and polishing processes commenced. Other Euclid products used for the project were VersaSpeed 100 for repairs, EucoFloor Epoxy Primer Sealer, and Ultraguard.

Nick Trovato, RJC Engineers practice director for building science and restoration, says the uncertainty that prevailed during the lockdowns of 2020 is slowly being replaced by confidence, “And our clients are moving ahead with restoration and maintenance work.”

Other projects have carried on, in spite of the pandemic. One project of note that has been several years under design and now under construction is the \$149-million restoration of the University of Alberta’s Dentistry & Pharmacy Building, a 1922 building that is undergoing extensive restoration and renovation. In addition to the restoration work, the utilitarian 1950s additions have



Dentistry & Pharmacy Building restoration, University of Alberta, Edmonton, AB.

been demolished to make way for a new seven-storey glass facility designed by GEC Architecture, with RJC providing structural and building envelope consulting services.

RJC’s commercial clients are also moving ahead with work that COVID has uniquely made especially salient: adaptive re-purposing of buildings. “Conversion

of offices to residential or hotels is nothing new to us, but the increasing shift of so many people from office settings to work-at-home settings means that more commercial inventory is becoming available for other purposes and can potentially cater to underserved markets, such as apartment rentals. These restoration projects often will incorporate improvements in energy performance, reducing operating costs. There are also tax breaks and other incentives from government to make this work economically attractive,” says Trovato.

Of these types of projects, Trovato says, “They can be challenging. To take just one example, developing residential suites in spaces that were originally used as offices means that heating and ventilation systems have to change to accommodate kitchens, laundries, bathrooms, and so forth. Building envelopes also would be retrofitted or replaced to improve energy efficiency and to provide operable windows for residents. But if the building has good bones, conversions can be much more feasible than building new, and there’s a strong environmental advantage to repurposing older structures instead of tearing them down.”

Finally, in addressing the topic of emerging trends, Trovato believes that changes to Energy Codes and the direction towards Net Zero/Carbon Neutrality for buildings will continue to change the construction of buildings. Also the WELL Building Standard (the first performance-based rating system to focus exclusively on measuring, certifying, and monitoring features of the built environment that impact human health and wellness) and others like it will increasingly play an important role in restoration, conversion, and other types of construction projects. He concludes, “COVID has made these types of standards especially desirable, and I think light, indoor air quality, and other elements that affect well-being will be a prominent consideration throughout the construction sector from here on in.” **A**

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