CASE STUDY

PUBLIC BUILDINGS/PLACES

Union Station moat renovation

Toronto, ON, Canada

Project **Information**

Project category:
Transportation

Year of construction:
1927

Years of MAPEI involvement:
2020-2021

MAPEI coordinators:
Jason Zeppieri and Lee Cuthbert

General contractor:
Bondfield Construction Company Ltd.

MAPEI distributor:
Form & Build Supply

Project owner:
The City of Toronto

Installer:
BMC Masonry

Architect:
NORR

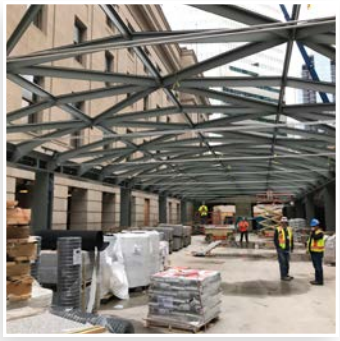
Photographer:
Christina Cicione Photography

Project **Overview**

Toronto, Ontario's central Union Station is a protected heritage site that sees hundreds of thousands of commuters and tourists daily. When an adjacent exterior pedestrian concourse known locally as "the moat" needed a makeover with improved drainage and durability, MAPEI had the single-source solution and technical services to meet every need.

Products Used

Fiberglass Mesh
Mapedrain™ 30
MAPEI Ultralite® S2
Mapelastic® 315
Mapesil® T
Planicrete® AC
Primer SN™
Topcem™ Premix
Ultracolor® Plus FA



MAPEI®

Union Station moat renovation

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Waterproofing the Union Station walkway (and commuters)

If you start to enter the words "Toronto flood" into a Google search bar, you'll soon notice the suggested years added by the algorithm: 2022, 2021, 2018, 2013… and 1954. That 59-year gap points to a trend that Toronto city planners and climate scientists know all too well: The phenomenon of serious flash-flooding from increasingly fierce storms is becoming more commonplace in recent years in Canada's largest city (as elsewhere). With that in mind, the City of Toronto decided to make improved waterproofing and drainage a primary spec for the renovation/beautification of the busy "moat" pedestrian concourse, which daily sees some 250,000 commuters passing in and out of the underground Union subway station situated in the heart of Canada's main financial district.

The moat slopes downward from street level to the underground subway entrance aside the landmark station on Front Street West. It "was a dark, dingy underground concourse" before renovations got underway in 2020, as described by MAPEI sales representative Jason Zeppieri, who along with colleague Lee Cuthbert, served as MAPEI coordinator for the project. A steel-framed, glass canopy over the exterior portion was later built above the new floor, made up mostly of flamed, granite stone tile imported from the province of Quebec and measuring 4 x 4 feet (1.22 x 1.22 m) and 3" (7.5 cm) thick.

Another vendor had originally been found to provide the drainage component. "But after seeing MAPEI had better products to meet freeze/thaw conditions, compressive strength and waterproofing needs, with the whole concrete restoration and stone-tiling solution single-sourced," Cuthbert said the specifiers at NORR went with MAPEI for the entire job.

MAPEI on the jobsite

While the cement-based waterproofing and crack-isolation membrane ***Mapelastic 315*** would later be applied (and embedded with the alkali-resistant ***Fiberglass Mesh***) by BMC Masonry as part of the product build, an extra component for drainage was needed at the very bottom of the new flooring solution. That first intervention atop the 35,000-square-foot (3 252-m^2) concrete substrate was the high-strength, prefabricated drainage composite ***Mapedrain 30***, selected to deal with any surges of excess water – such as during floods or accelerated snow melt – and direct them down into the city sewers, Zeppieri noted. *Mapedrain 30* consists of a woven filter fabric bonded to individual dimples of a molded polypropylene core, minimizing fabric intrusion into the drainage channels caused by overburden pressure.

"We needed a strong drainage composite in place because it would be covered by a 2" [5-cm] screed mortar as a floating floor, the super-heavy 3" [7.5-cm] granite stone, and then the heavy machinery to install the canopy over the exterior portion," a process that

Waterproofing the Union Station walkway (and commuters)

got underway as soon as the flooring had cured, Zeppieri said.

Laying down that floating floor would be an undertaking of military-grade logistics itself. “When BMC Masonry came to us, they wanted assurance of meeting strict timelines. When we needed to be there and supply them, we were there. Lee and I did site visits and made sure any unforeseen issues on the jobsite were taken care of right away,” Zeppieri added.

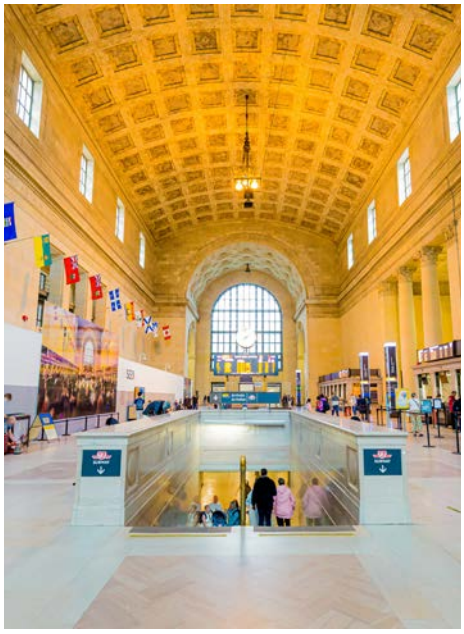
“At times we had to tarp up the skids [for inclement weather], and we got rained on. The floor had to be done before the canopy could be constructed,” he said. “Deliveries had to be done at 2:00 a.m. because of municipal restrictions for the area. [In all], 19 trucks of 23,000 bags of ***Topcem Premix*** alone were brought in from nearby Brampton,” located just northwest of the city.

To create the floating floor, installers added ***Planicrete AC*** acrylic latex admixture to the *Topcem Premix* (instead of water) for extra compressive strength, and added a welded-wire mesh.

Working one 650-lb. (295-kg) slab of flamed-granite stone at a time, the crews set them using ***MAPEI Ultralite S2*** highly deformable, lightweight, gauged-tile mortar with polymer. Because it’s formulated with Easy Glide Technology™ for ease of application and superior transfer properties to enhance back-buttering, it made surprisingly quick work of installing the massive stone slabs. Each slab needed a forklift with hydraulic suction for placement, while the BMC masonry crew positioned it by hand to meet the strict flatness required to avoid lippage.

The need for a quick turnaround and resilience against freeze/thaw conditions determined the choice for grouting. ***Ultracolor Plus FA*** grout was selected for its rapid-setting properties and its DropEffect™ technology, which reduces surface absorption and helps repel water, dirt and grime from penetrating grout joints. ***Mapesil T*** was used as a flexible sealant for heavy traffic and movement joints.

By July 2021, the work was complete. Toronto pedestrians entering and exiting Union Station’s underground now enjoy a wider, extended walkway of flamed-granite stone, with a glass roof protecting them from the elements and keeping the moat dry in all but the harshest of storms – and drainage system to keep it that way in the years to come. Torontonians may eventually wonder why it was called “the moat” in the first place.



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