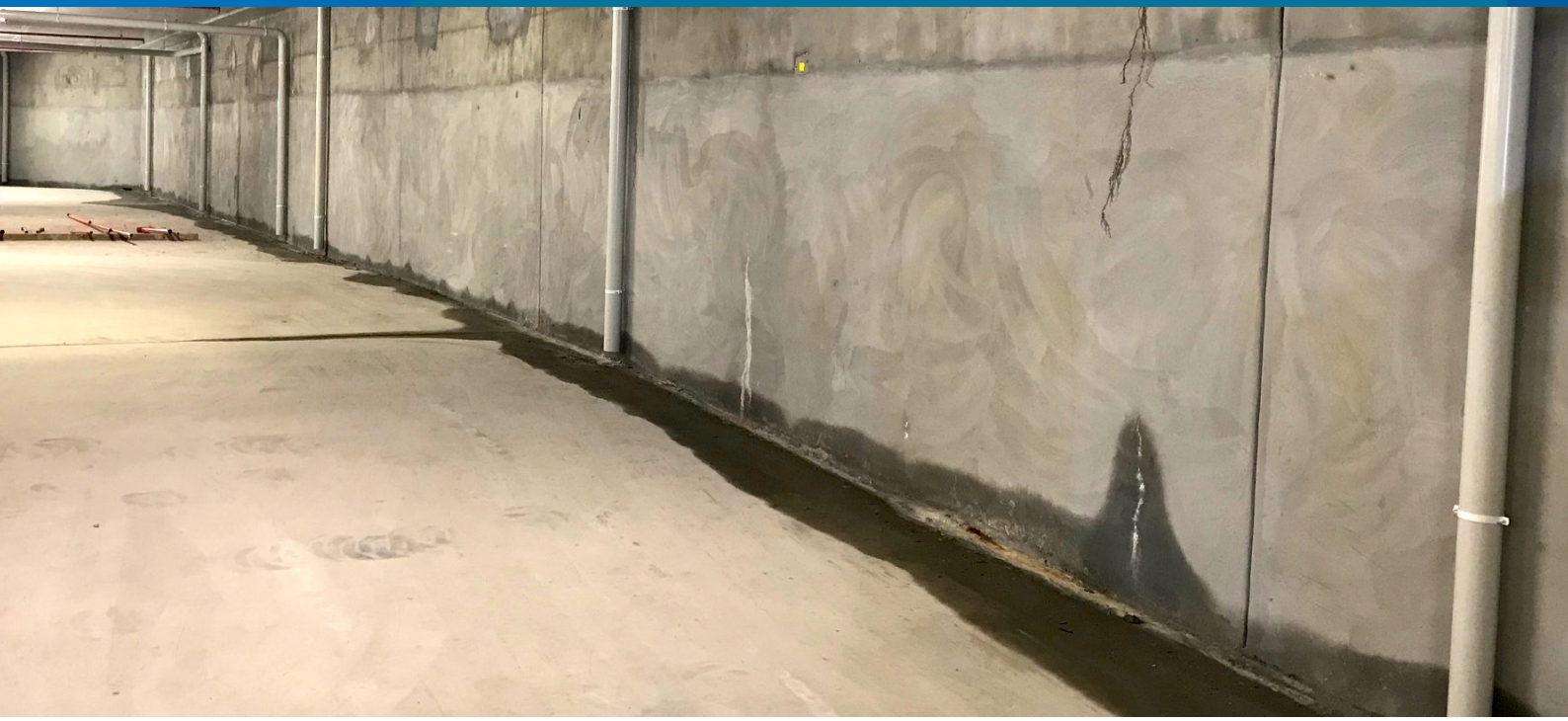
PROJECT PROFILE
N20GW128

mainmark

Water Ingress in Building Basement Eliminated with Acrylic Gel



INDUSTRY
Commercial

STRUCTURE
Underground Basement

PROBLEM
Water ingress

LOCATION
Wollongong, NSW, Australia

DURATION / YEAR
1 week / February 2020

TECHNOLOGY
Acrylic Gel

BUSINESS UNIT
Mainmark Asset Preservation

Summary

A commercial property under construction in Wollongong was experiencing water ingress in the basement, primarily caused by the high water table located approximately 2m above the basement slab.

The site was originally de-watered, however, when the de-watering system was removed after the basement construction was completed, the water ingress progressively increased. Water leakage was evident across the basement slab to the wall junction, along the lift shaft wall and other spot locations.

Before the building's mechanical services, electrical lift and car stackers could be installed, the basement needed to be completely dry. In order to arrest the water ingress, the source of the leakage needed to be located, which proved challenging due to the latent ground conditions. The change in the hydraulic ground water gradient, local to the basement's perimeter, could not be easily identified.

Mainmark's team was able to locate the source of the water, which was found to be leaking through the combination secant piled and shotcrete wall system and the basement slab. They were then able to successfully deliver a perimeter treatment that intersected the interface between the wall system and the middle of the concrete slab.

The high water table, unrestricted ground water runoff movement, and potential seepage via other un-tanked openings of the basement, particularly after heavy rain events, were major considerations when selecting a suitable water stop solution for the basement.

Given the time constraints and budget, Mainmark recommended using a specially formulated acrylic gel, which provided a flexible membrane and sealant between the basement concrete wall and original membrane previously installed at the rear of the basement wall.

Objectives

A long-term waterproofing solution that could seal the basement and eliminate water ingress was required for the construction to progress. The solution also needed to seal leaks at the joints, cracks and gaps in the concrete while diverting moisture away from the treated areas.

Solution

Prior to the project commencement, the Mainmark team successfully identified the source of water ingress behind the basement walls, despite limited information available to guide them to the source of the leaks. The water was then diverted into the building's drainage system, preventing it from penetrating through the basement substrates.

Mainmark injected a specially formulated acrylic gel to areas where leaking was evident. The acrylic-based hydro-structural resin was identified as the most appropriate solution due to the product's ability to track the exact path of the water source, seal using a controllable reaction time, and ultra-low viscosity to seal behind the blind sides of the basement walls.

Once the preparatory drilling process is complete, the acrylic gel is easy to inject and boasts fast reaction and curing times. The variable setting time allows operators to adjust the speed of flow so the product is not diluted, allowing it to set behind and within the structure. The low viscous solution can also re-emulsify up to 500 times, boasts excellent adhesive properties, and is able to seal wet and dry substrates and surfaces.

The client placed a high degree of trust in Mainmark for this basement project, as there was limited information available about where the leaks started and finished. For this reason, and to help ensure the project remained within budget, initially only areas with evident leaking in the basement areas were treated. The acrylic gel provided an efficient and effective solution for a problematic situation that alternatively could have required the client to undertake a very expensive, full curtain membrane of the substrate.

Injection points across basement walls

Water leakage through basement staircase before injection

Water leakage through basement staircase after injection