

Atlantis®
GREEN CITIES FOR LIFE

Maple Leaf Self Storage

Project Location

Calgary, Alberta, Canada

Atlantis Application

Stormwater Detention

Project Overview

The Maple Leaf Self Storage development required an underground stormwater detention system capable of managing runoff from the site's car park while preserving valuable surface parking space.

The Atlantis Flo-Tank® modular detention system was installed beneath the vehicle parking area to temporarily store stormwater collected from surface catch basins before releasing it through a controlled outlet to the municipal stormwater network. By attenuating peak flows, the system assists in reducing downstream flooding and minimising stream erosion during heavy rainfall events.

Technical Summary

Project	Maple Leaf Self Storage
Location	Calgary, Alberta, Canada
Application	Underground Stormwater Detention
Completion	May 2006
Storage Capacity	71.96 m^3
Surface Use	Vehicle Car Park
Cover Depth	600 mm
Atlantis System	Flo-Tank®
Design Loading	H-20 Traffic Loading
Discharge Method	Controlled outlet to municipal storm sewer

Design Challenge

Urban commercial developments require stormwater systems that balance hydraulic performance with efficient land use.

For this project, the detention system needed to:

01 Provide underground stormwater storage beneath an operational car park.

02 Maintain structural integrity under H-20 traffic loading.

03 Operate with only 600 mm of cover above the storage system.

04 Integrate with the site's catch basin drainage network.

05 Control discharge into the municipal stormwater system.

06 Reduce downstream flooding and erosion caused by peak runoff events.

Engineering Solution

The Atlantis Flo-Tank® modular detention system was installed beneath the car park to provide 71.96 m³ of underground stormwater storage.

Surface runoff collected through a network of catch basins was conveyed into the underground storage system via buried pipework. Stormwater was temporarily detained within the high-void modular structure before being discharged through a controlled outlet to the municipal storm sewer.

The shallow installation profile, combined with the structural capacity of the modular system, enabled the detention tank to be installed beneath trafficked pavement while satisfying H-20 loading requirements with only 600 mm of cover.

Design Benefits

✓ Underground detention preserving valuable parking area.
✓ High-void storage maximising detention capacity within the excavation footprint.
✓ Controlled outlet reducing downstream peak discharge.
✓ Shallow installation profile requiring only 600 mm of cover.
✓ Suitable for H-20 traffic loading applications.
✓ Modular system adaptable to future site layouts and expansion.

Construction Considerations

The modular construction sequence simplified installation while reducing the need for large precast concrete structures.

Construction involved:

- Excavation and subgrade preparation.
- Placement of the impermeable liner and geotextile.
- Installation of Atlantis Flo-Tank® modules.
- Progressive backfilling around the storage system.
- Placement of geogrid reinforcement above the tank.
- Final backfilling and pavement construction.

The staged installation sequence allowed the underground detention system to be fully integrated beneath the future parking area while maintaining structural support for the pavement above.

Project Outcomes

- 71.96 m³ underground detention capacity installed beneath the car park.
- Successful integration with the site's stormwater drainage network.
- Controlled discharge to the municipal storm sewer.
- H-20 traffic loading achieved with only 600 mm cover.
- Reduced downstream flooding and stream erosion through peak flow attenuation.
- Surface parking area fully preserved.

Engineering Insight

As urban developments become increasingly space constrained, underground detention systems enable stormwater infrastructure to be integrated beneath functional hardstand areas without sacrificing developable land.

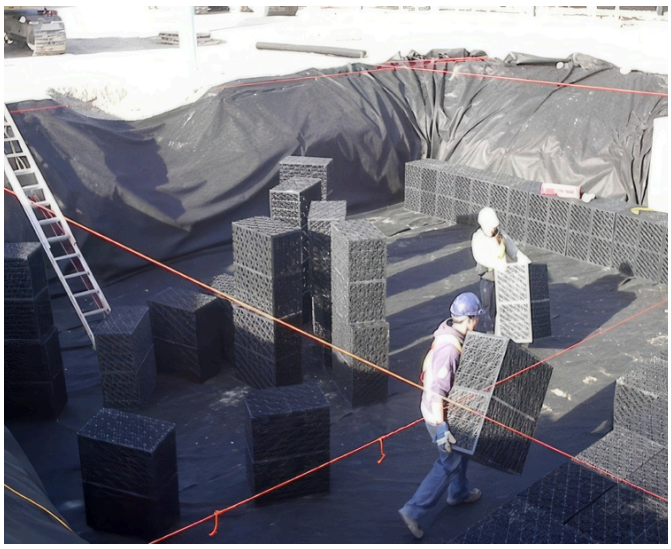
Modular detention systems offer designers significant flexibility by combining high storage efficiency with shallow installation depths. When paired with controlled outlet structures, they effectively reduce peak discharge rates, helping developments comply with stormwater management objectives while minimising downstream flooding and erosion.

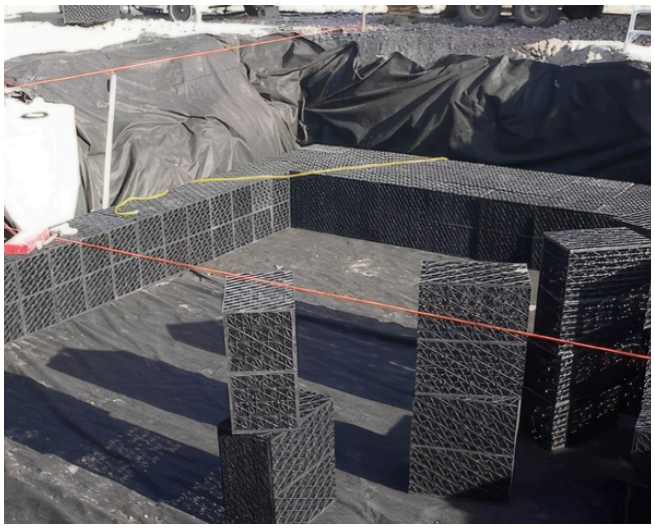
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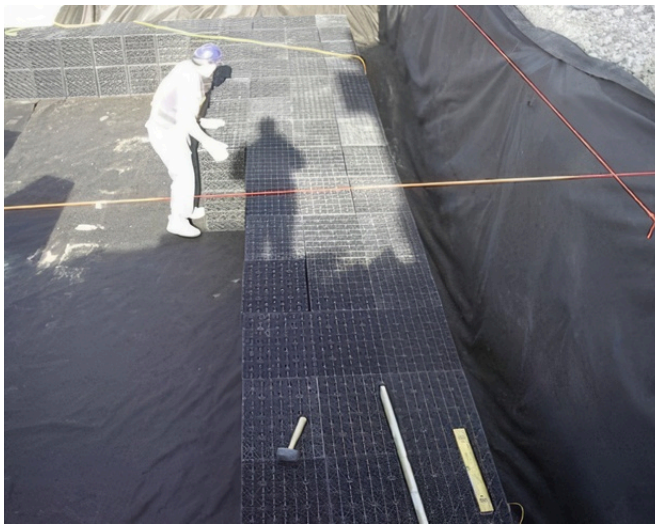
Why is controlled discharge important in stormwater detention systems?

Stormwater detention systems are designed to temporarily store runoff and release it at a controlled rate, rather than discharging it immediately into the drainage network. By slowing the release of water, detention systems reduce peak flow rates, helping to prevent downstream flooding, minimise stream erosion, and improve the overall performance of municipal stormwater infrastructure during major rainfall events.















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Thank You For Your Attention



Contact Us

Phone Number:
+61 (2) 9417 8344

Website:
www.atlantiscorporation.com.au

Email Address:
info@atlantiscorp.com.au