Case Study

Hydro International
A CRH COMPANY

Downstream Defender® Helps Protect Mexico City from Flooding

Located opposite the iconic Estadio Azteca in southern Mexico City, Jardín de Lluvia Coapam (Coapam Rain Garden) is an innovative green infrastructure project designed to reduce flooding, improve stormwater management and create a valuable public space for the local community.

Developed as part of Mexico City's wider strategy to increase climate resilience and expand green infrastructure, the project transformed a previously underutilised site into a stormwater retention and infiltration asset. At the heart of the scheme is a 1,600m³ infiltration tank and rain garden designed to capture, store and naturally manage stormwater runoff.

Product profile

The Downstream Defender® is an advanced hydrodynamic vortex separator designed to capture and retain sediment, oils and floatable debris from stormwater runoff across a wide range of flow conditions.

Its compact design provides effective stormwater treatment while helping to protect downstream infrastructure and receiving environments.

Using proven vortex separation technology, the system removes pollutants before they enter storage systems, green infrastructure assets or receiving waters. Designed to retain captured pollutants during storm events, it delivers reliable, low-maintenance performance for urban stormwater applications.

Flooding Challenges in Mexico City

Mexico City was built on the former Lake Texcoco lakebed, within a high-altitude basin surrounded by mountains and volcanoes. The city's historic wetland environment and constrained natural drainage continue to contribute to flooding challenges during periods of heavy rainfall.

Mexico City experiences intense seasonal rainfall, with the majority of precipitation occurring between June and September. Heavy rainfall events can place significant pressure on the city's drainage infrastructure, disrupting transport networks and increasing the risk of urban flooding.

Jardín de Lluvia Coapam forms part of a wider flood mitigation strategy designed to reduce flooding in a low-lying area at the foot of the surrounding catchment. Runoff from the adjacent urbanised slopes naturally drains towards the Estadio Azteca corridor, making the location particularly susceptible to flooding during heavy storms.

With major international events, including FIFA World Cup fixtures, taking place at the stadium, effective stormwater management has become increasingly important.

The project demonstrates how green infrastructure can complement traditional drainage systems to improve urban resilience and water management.

Product Highlights

- Two 6ft Downstream Defender® units installed.
- Protects a 1,600m³ infiltration tank and rain garden from sediment and debris accumulation.
- Reliably captures and retains sediment, oils and floatable debris across a wide range of storm flows.
- Protects downstream green infrastructure assets and supports long-term system performance.
- Compact, low-maintenance treatment solution ideal for urban environments.

Problem

To support the flood mitigation strategy, a 1,600m³ infiltration tank and rain garden were developed to retain, infiltrate and reuse stormwater. However, runoff entering the system carries sediment, hydrocarbons and floating debris from surrounding roads and urban surfaces.

The site's proximity to Estadio Azteca creates an additional challenge, with major sporting and public events generating significant volumes of litter that can enter the drainage network during storm events.

Without effective pretreatment, these pollutants could accumulate within the infiltration tank and rain garden, reducing operational performance, increasing maintenance requirements and compromising the long-term effectiveness of the green infrastructure system.

Solution

Working alongside project stakeholders including GETF and SEGIAGUA, **Soluciones Hidropluviales**, Hydro International's distributor in Mexico, undertook hydrological and hydraulic assessments and developed a stormwater treatment strategy to protect the rain garden and underground storage system.

The solution incorporated two 6ft Hydro International Downstream Defender® hydrodynamic vortex separators installed upstream of the infiltration tank and rain garden. The systems were selected for their ability to reliably capture and retain sediment, oils and floatable debris across a wide range of storm flows, helping to protect the rain garden and infiltration tank from pollutant accumulation.

Additional screening measures were incorporated to capture larger litter associated with high-footfall events at the stadium. Together, the treatment systems help protect both the infiltration tank and rain garden from pollutant build-up, supporting long-term performance while reducing maintenance requirements.

Outcome

Completed in April 2026, the project has already demonstrated its effectiveness under real-world conditions. During a major storm event in June 2026, when approximately 90mm of rainfall was recorded, the system successfully retained and managed stormwater flows, helping to reduce flooding impacts in the surrounding area.

The Downstream Defender® units have also successfully captured sediment and debris throughout the rainy season, helping to maintain the performance of the rain garden and infiltration system.

Beyond its flood management function, Jardín de Lluvia Coapam has become a valuable public amenity and a visible example of how green infrastructure and stormwater treatment technologies can work together to deliver multiple benefits, including flood resilience, groundwater recharge, water conservation and urban greening.

The project is now being viewed as a model for future *Sponge City* initiatives across Mexico, demonstrating how collaboration between public authorities, private investment and specialist water management partners can create sustainable solutions to urban flooding while enhancing the public realm.

Learn more

To learn more about how the Downstream Defender® can help you to manage water more effectively, visit **hydro-int.com**, search **Downstream Defender®** online or contact us:

Europe
+44 (0)1275 878371
enquiries@hydro-int.com

Asia Pacific
+61 436 433 686
enquiries@hydro-int.com

Middle East
+971 506 026 400
enquiries@hydro-int.com

hydro-int.com/contact