

Case Study



'Optimum' Savings for Developer with 21st Century Drainage

Project profile

Objective

Scottish Water set the discharge consent for the site to 4.5 l/s/ha. This needed to be cost-effectively met – collecting from 1.9 ha of hard surfaces including roofs to 215 homes, all access roads and car parking.

Solution

The use of 3 No. Hydro-Brake® Optimum vortex flow controls enabled the developer to not only meet the discharge consent for the site but also to save around 30% in construction costs whilst protecting the development over a wide range of event probabilities from 1 in 30 years to 1 in 100 years.

As the first phase of Edinburgh City Council's 21st Century Homes project for much-needed affordable housing, the Gracemount development is showcasing sustainable construction. A major feature of the drainage solution is Hydro International's high performance Hydro-Brake® Optimum to control surface water which saved the developers over 30% in storage construction costs.

"We had been reviewing the options for vortex flow control systems for discharge attenuation," comments Craig Milne, Director, Will Rudd Davidson, the consultant engineers for the project which is being developed by Cruden Homes. "Working with Hydro's Design Team, I was able to demonstrate that the storage volume required could be reduced from 597cu.m. to 487 cu.m. when using the new Hydro-Brake® Optimum."

"This meant that we could save around 30% in construction costs for the storage, which easily offset initial investment, so the decision to incorporate Hydro-Brake® Optimum was very easy to make. As a result we were able to rewrite the specifications for storage attenuation to submit to Scottish Water and Edinburgh CC's Roads Department."

On the 3.1 ha development surface water is collected from 1.9 ha of hard surfaces including roofs to 215 homes, all access roads and car parking for discharge to the public storm sewer.

Product profile

- No moving parts.
- No power requirement.
- Self-activating and self-cleansing.
- Outlet 3-6 times larger than conventional controls.
- Can reduce storage requirements by up to 30% when compared to an orifice plate.



Photograph courtesy of Edinburgh City Council

Discharge consent is set by Scottish Water at 4.5 l/s/ha, the equivalent of greenfield runoff, resulting in a total for the development of 13.5 l/s/ha, from the final total of 220 homes plus infrastructure.

In this tightly built-up location, with limited space for major landscaping features, the stormwater storage is divided into three. Hydro's Stormcell® modular block storage system is installed under landscaping, 1500 mm concrete pipes under the access roads and large aggregate banks under the car park, all installed by Advance Construction Ltd.

The pipe storage is discharged through a single Hydro-Brake® Optimum vortex flow control device, while the aggregate and Stormcell® storage are served by two smaller Hydro-Brake® Optimum units acting in parallel. The final outlet to the storm sewer combines the two discharges.

"The arrangement of the twin attenuation units allows us flexibility to deal with the variations in rainfall that may occur due to climate change," continues Craig Milne. "Once one control is working at its maximum rate, the second unit kicks in. The capability enables the installation to cope with a wide range of event probabilities from 1 in 30 years to 1 in 100."

The apartments and houses being built at Gracemount will be available for rent, shared equity and market sale. Their sustainable design focuses on low energy use and minimal carbon footprint, using high levels of insulation and advanced heat recovery systems.

The newly launched Hydro Brake® Optimum sets new performance standards for vortex flow control devices and achieves significant construction cost savings. By dispensing with the need to choose from a range of sizes and types the Hydro-Brake® Optimum instead offers built-in flexibility to size each unit for absolute fit. From now on, one type of Hydro-Brake®, the Hydro-Brake® Optimum perfectly balances flow rates and surface water storage requirements to suit each drainage project without approximation.

Hydro's existing range of Hydro-Brake® Flow Controls already provides significant savings in surface water storage over conventional flow controls. Now the Hydro-Brake® Optimum offers up to a further 15% saving when compared to other vortex flow control devices. By saving on surface water storage, Hydro-Brake® Optimum therefore promises outstanding savings in excavation costs and frees up more land for building to maximise the developers' Return on Investment.



The screenshot shows the 'DESIGN' section of the Hydro-Int website. It features three main product categories with images and brief descriptions:

- Hydro-Brake® Optimum**: Vortex flow control. Description: Design uniquely effective flow control for use in flood mitigation and stormwater management projects.
- Downstream Defender®**: Advanced stormwater separator. Description: Design reliable treatment systems for surface water pollution capture.
- First Defense®**: Versatile stormwater separator. Description: Design reliable treatment systems for surface water pollution capture.

Below each product image are links: 'Design 1.', 'Design 2.', and 'Design 3.'

Design a Hydro-Brake® Optimum with our Online Design Tool

As well as Hydro-Brake® Optimum, our online design tool now enables you to design your own Downstream Defender® or First Defense® stormwater treatment separators.

The tool also allows you to save project designs and submit them to our expert technical team for a free design review.

hydro-int.design

Learn more

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

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