



# Hydro-Brake<sup>®</sup> Flood Alleviation

## The Vortex Controlled Fluvial Flood Solution



# Hydro-Brake® Flood Alleviation Flow Control

## The vortex controlled fluvial flood solution

### Floods

Protecting homes and businesses vulnerable to fluvial flooding from the devastation and financial loss it can cause is a high priority for Government agencies, flood authorities and local communities in the UK.

High profile floods have made news headlines and raised fears of more frequent events as a result of climate change. 5.4 million properties in England and Wales (1 in 6) are at risk of flooding. The average annual cost of damage from flooding in England and Wales is estimated at more than £1.2 billion<sup>1</sup>.

Hydro International's Hydro-Brake® Flood Alleviation flow controls are already delivering sustainable, low-maintenance, no-power solutions that help provide over £200m worth of flood damage protection<sup>2</sup> to more than 6,000 properties. They range from dispersed storage and control schemes with pass forward flow rates of just a few litres per second to major dams controlling flows in excess of 10 m<sup>3</sup>/s and holding back millions of cu.m of flood water.

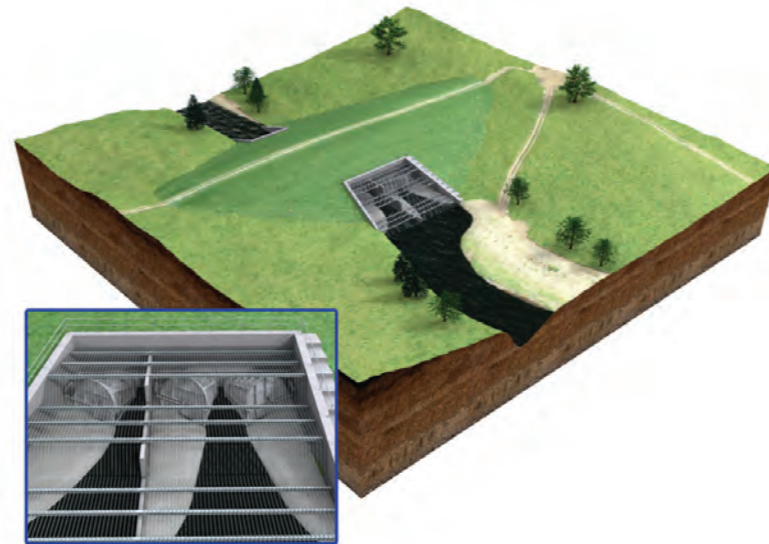
<sup>1</sup> Source: EA 2009 Investing for the Future, Flood and Coastal Risk Management in England report, EA Wales 2009 Flooding in Wales: a National Assessment of Flood Risk report.  
<sup>2</sup> Value of protection is calculated using the number of properties protected and figures taken from Flood Plain Speaking, David Crichton, Chartered Insurance Institute, March 2012.

### Product Profile

The Hydro-Brake® Flood Alleviation flow control is a vortex controlled solution to fluvial flooding. With no moving parts and no power requirements Hydro-Brake® Flood Alleviation is ideal for controlling very large river and watercourse flows.

The bespoke design and performance characteristic of the Hydro-Brake® Flood Alleviation flow control can reduce the volume of flood water to be stored by up to 30% compared to fixed orifice controls; reducing land take during storm events.

Hydro-Brake® Flood Alleviation flow controls have a proven track record dating back to a first pioneering application in the early 1990's.



### Advantages

- Proven track record in the UK.
- Self-activating.
- No moving parts.
- No power requirement.
- Up to 30% storage saving over fixed orifice type devices.
- Large open area at all flow rates resulting in:
  - reduced blockage risk;
  - reduced flow velocities.
- Future proof - can allow for:
  - variances in fluvial hydraulic modelling;
  - climate change adaptation.
- Structurally fit-for-purpose.
- Aerates the flow.
- Reduces scour / erosion of outlet structure.

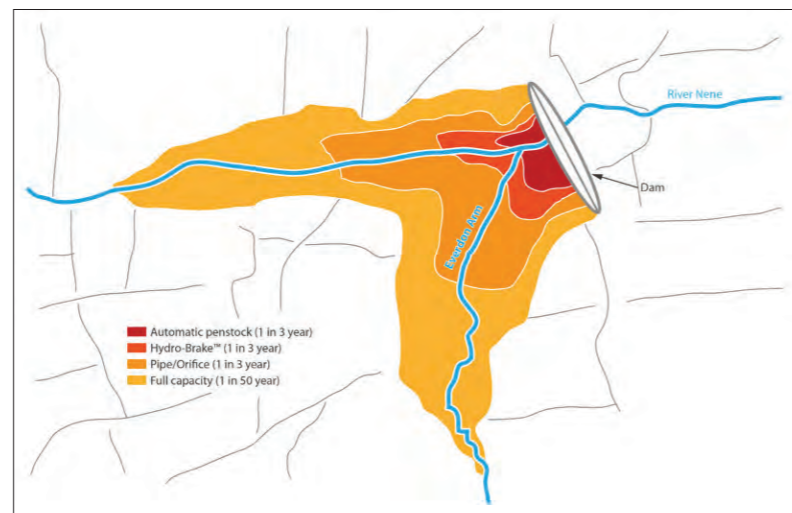


Diagram showing savings in storage achieved on a scheme in Northants.

### Track Record

Proven track record in the UK. Example schemes include:

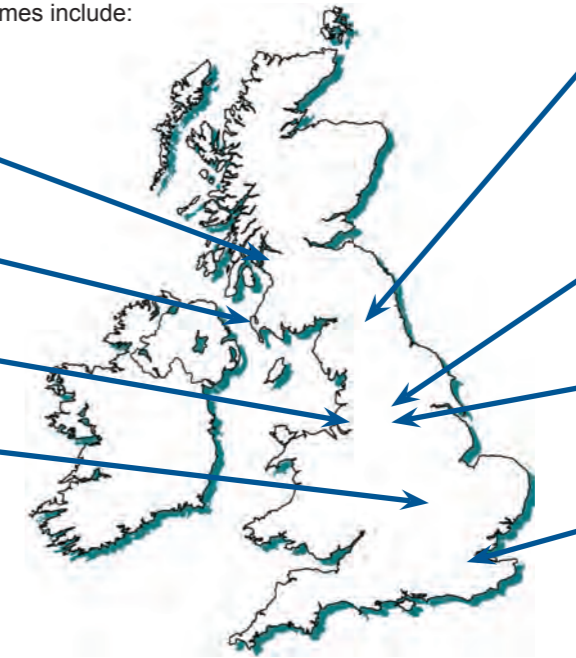
**White Cart Water, Glasgow**  
 Properties protected: 1,750  
 Value of protection: £100m

**Portpatrick**  
 Properties protected: 104  
 Value of protection: £2.5m

**River Douglas, Wigan**  
 Properties protected: 780  
 Value of protection: £29m

**Weedon Bec, Northants**  
 Properties protected: 95  
 Value of protection: £2m

**Featured as a case study in the Environment Agency's Fluvial Design Guide.**



**River Gaunless, Co. Durham**  
 Properties protected: 300  
 Value of protection: £11m

**Ings Beck, Wakefield**  
 Properties protected: 774  
 Value of protection: £28.9m

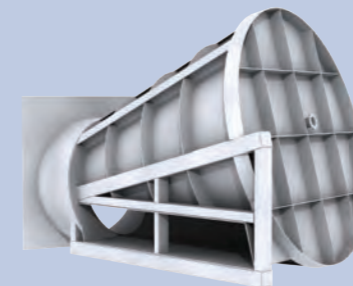
**Devil's Bridge, Sheffield**  
 Properties protected: 70  
 Value of protection: £2.6m

**Ashford, Kent**  
 Properties protected: >100  
 Value of protection: >£3.8m

### Project Steps

#### Step 1 - Preliminary Design

Using the knowledge and experience developed through previous successful schemes, we will create a design concept. This will include preliminary unit sizing and specification.



#### Step 4 - Fabrication

Modern production methods and controls are implemented to ensure that the design & performance objectives are delivered.

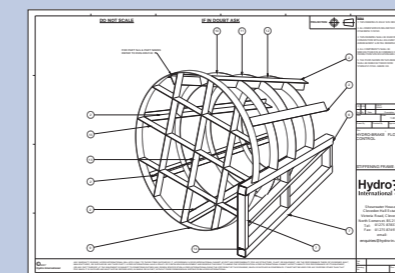


#### Step 2 - Confirmation of Design & Performance Objectives

Fluvial interventions have a direct impact on the hydrology, geomorphology and ecology of the river, but impacts also extend beyond the physical environment. Working with you, we will agree the design and performance objectives in line with the flood risk management strategy.

#### Step 3 - Detailed Design

Detailed design can include Computational Fluid Dynamic (CFD) modelling and structural calculations and / or modelling using Finite Element Analysis (FEA); scale testing; and production of detailed design drawings and specifications.



#### Step 5 - Installation

Hydro-Brake® Flood Alleviation units can often be engineering feats on a vast scale. We can provide support and assistance through the installation phase.



#### Step 6 - Monitoring

Flood alleviation at the fluvial level can be shown to deliver a level of protection far greater than the project costs. We can offer support and advice on post installation monitoring of the value of the intervention.



What is HX?

HX is the essence of Hydro. It's interwoven into every strand of Hydro's story, from our products to our people, our engineering pedigree to our approach to business and problem-solving.

HX is a stamp of quality and a mark of our commitment to optimum process performance. A Hydro solution is tried, tested and proven.

There is no equivalent to Hydro HX.

Case Studies

Weedon Bec, Northants

Case study document for Weedon Dam Flood Alleviation Scheme, including project profile, objectives, and photos of the dam structure.

Devil's Bridge, Sheffield

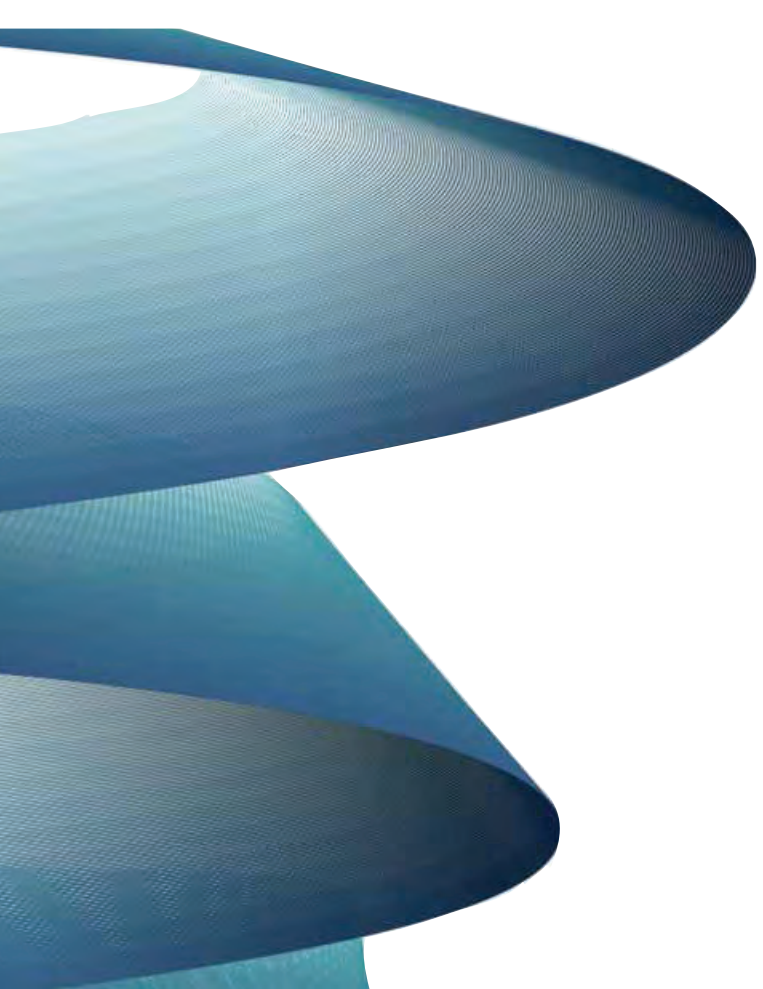
Case study document for Hydro-Brake® Flow Controls Specified to Relieve Yorkshire Flooding, including project profile and photos of the bridge.

Portpatrick, Dumfries & Galloway

Case study document for Hydro-Brake® Flow Control at Core of Portpatrick, including project profile and photos of the coastal area.

Wigan

Case study document for Torrential Rain Tests Wigan's Hydro-Brake® Flood Defences, including project profile and photos of the flood defences.



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