



A46 Hydro-Brake® Flow Controls Throttle Back Runoff in Hybrid SuDS Scheme

A Stormwater Case Study

Project Profile

Objective

To control the surface water runoff for an increased surface area due to a new road layout.

Solution

The objective was met by installing 12 balancing ponds and the required flow was regulated by using a Hydro-Brake® Flow Control for each pond.

Product Profile

- Reduces stormwater storage requirements by up to 30%.
- Up to 50% savings in project costs.
- Self-activating with no moving parts or power requirements.
- Area of opening is 3-6 times larger than the equivalent orifice.

The new WRc and BBA approved Hydro-Brake Optimum® is now available. Find out more at www.hydro-int.com

The Highways Agency's £375 million upgrade to create 28 kilometres of new dual carriageway on the A46 in Nottinghamshire is using a Sustainable Drainage solution combining natural and engineered techniques to achieve pre-development surface water runoff in a sensitive location.

Doubling the surface area of the metalled Newark to Widmerpool trunk road would have created unacceptably high surface water runoff. Principal contractor Balfour Beatty and their consultant engineers, URS Scott Wilson, designed a series of 12 balancing ponds with the outfall from each controlled by Hydro International's Hydro-Brake® Flow Control devices.

Environment Agency guidelines require flow restrictions to be held at the predevelopment rate for greenfield runoff, to attenuate water volumes into local watercourses and control water quality. The route of the A46 lies adjacent to several environmentally, agriculturally and historically sensitive locations as well as within the flood plains of the Rivers Trent and Devon.

The balancing ponds are designed with a permanently wet sump area and vegetated dry sections to ensure optimum entrapment of debris and silt at most stages of inflow. The outflow of each pond is fitted with a Hydro-Brake® Flow Control device or chamber, depending on the maximum design flow required, from 27.5 to 66 litres/sec.

BBCEL Site Engineer Steve Sloan commented: "A series of 12 balancing ponds of differing sizes were constructed, accepting flow from between 800 metres to two km of highway. They discharge into many different watercourses along the route, and the Hydro-Brake® is widely recognised as the best flow control device for these projects."

Hydro International Regional Technical Manager, Karl Hall added: "As well as highly effective flow control, the flow characteristics of Hydro-Brake® installations ensure minimal land grab for pond construction; this can save up to 15% in pond area over other vortex devices and as much as 30% over the requirements of equipment such as orifice plates.

"Where extra land alongside the existing road has had to be purchased for the road widening and associated drainage, a saving in land requirements makes excellent financial sense too."

Undertaken by contractor Balfour Beatty Civil Engineering Limited, work started on the A46 upgrade scheme in 2009, and was completed in summer 2012. The construction project will improve traffic flow and safety, while by-passing several villages.



Project under construction