

Weedon Flood Storage Scheme - the Biggest Hydro-Brake® in the World

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SYNOPSIS. The Northamptonshire villages around Weedon in the upper River Nene valley, suffered disastrous flooding in 1947, 1992 and 1998, with Weedon Bec being particularly badly affected. The channel through the village is constricted by historic developments and the opportunity to enlarge the channels was not available. Restricted culverts under the railway embankments downstream compounded the flood situation. To alleviate the problem the Environment Agency and Halcrow Group developed an upstream on-line storage reservoir scheme.

The project includes a 450m long, 6.8m high clay embankment across the valley, with a culvert on the line of the original river channel to carry the controlled outflow. A 150m long concrete-block spillway carries excess flood flows over the embankment. The embankment site has been landscaped to minimise visual impacts and the borrow area has been developed into a large wetland area as a habitat for aquatic flora and fauna.

The key component of the flow control system is a 6.5 tonne, stainless steel Hydro-Brake® Flow Control device located in the dam inlet structure. The Hydro-Brake® was designed by Hydro International to control the maximum outflow rate despite fluctuating head, and incorporates the facility to adjust the controlled outflow between 8 and 12m³/s. The use of the Hydro-Brake® helped reduce the upstream storage requirement and hence the land take and frequency of flooding involved.

This paper provides a description of the options considered during the design stage of the flood defence scheme, details of the actual design and construction of the dam, an explanation of how the Hydro-Brake® operates and the benefits it provides over other forms of flow control.