

SESSION 2 : PRESENTATION OF SUBMITTED PAPERS AND DISCUSSION PERIOD

Session Chairman Mr A K Harden, Travers Morgan and Partners

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(d) Hydrobrakes in WASSP

- R Smisson, Hydro Research and Development Ltd

The use of the WASSP simulation program is becoming common in the UK to enable the modelling of drainage systems and the simulation of the effects of drainage works or development. The use of attenuation storage is one major strategy available to designers when considering stormwater flood prevention and the WASSP-SIM computer program has been designed so as to enable the effects of storage to be evaluated. The simulation includes a flood routing module whereby the storm flood wave can be routed through a storage facility with a flow control within a system to determine the effect of that storage. The WASSP-SIM program normally assumes that control will be achieved either by a pumping station or by using a sharp edged orifice as the flow control, however, facilities have recently been added to WASSP-SIM, to enable the simulation of other types of flow control whose characteristic can be input in the form of a "look-up" table. This can be useful in many cases where, by the careful design of the control device, the use of storage may be optimised by allowing more flow to pass earlier in a storm. The use of devices such as Hydro-Brake Flow Controls can result in the need for significantly reduced storage volumes to attenuate a design storm, typically of the order of 7-15% and on one project a 30% reduction in volume has been achieved. The simulation of Hydro-Brake Flow Controls is not straightforward and this paper explained how vortex flow controls work, how this affects mathematical modelling, and made recommendations for the practical means for their modelling on WASSP. For further information see also WaPUG User Note No.1.

D Balmforth, Sheffield Polytechnic

The necessity for a free discharge when modelling hydrobrakes also applies to orifice controls.

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D Dring, Severn Trent Water Authority

How can hydrobrakes be used in steep catchments.

R Smisson

The standard type of hydrobrake is used typically at the bottom of a backdrop where the brake forms a water cushion and also reduces the problem of air entrainment. Hydrobrakes may generally be used anywhere where flow control is appropriate.

e) Hydrobrakes in WASSP

R. Smisson, Hydro Research and Development Limited

See Leeds Meeting for Synopsis

J. Croke, Anglian Water Authority

Are there ways users of hydrobrakes can work out their characteristics without having to refer to Hydroresearch Ltd.

R. Smisson

A computer programme is available from Hydroresearch which will compute the characteristics of hydrobrakes. It is available to all users of hydrobrakes.

T. Atkins, Gloucester C.C.

Are hydrobrakes better than a standard orifice with regard to their resistance to blockage.

R. Smisson

Any flow control device is prone to blockage problems. Approximately 5% of hydrobrakes in service have been reported as having been blocked. These have largely been in the range of 100 - 200mm. A hydrobrake, however, will always have a larger clean opening than an orifice and must therefore be less prone to blockage.

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Unknown user

Are Hydrobrake applicable to situations with high base flows.

R. Smisson

They operate in a similar way to an orifice, however high base flows are better from the aspect of self cleansing.