

Remedial works at Sutton Bingham Reservoir

J WELBANK, Wessex Water
R SOLOMAN, Wessex Water
J L HINKS, Halcrow Group Limited
G GREEN, Halcrow Group Limited
R PHILLIPS, Halcrow Group Limited

SYNOPSIS. Sutton Bingham Dam, near Yeovil in Somerset, was completed in 1955 and is possibly the last embankment dam in the UK to have been constructed with a puddle clay core. The dam behaved satisfactorily until October 2006 when the annual settlement readings along the crest showed a sudden increase of up to 80 mm over a length of about 45 metres. There was further settlement of 73 mm during the period from October 2006 to January 2008. The settlement together with the observed distortion of the concrete slabs was indicative of an incipient slope failure in the upstream shoulder of the dam.

As soon as the problem was drawn to the attention of the Panel Engineer in October 2006 he asked for the water level to be held down 2 m below Top Water Level to mitigate the consequences of any future slip. Meanwhile intensive monitoring and site investigations were put in hand. Considerable difficulty was encountered maintaining the target water level when significant inflows occurred during the early months of 2007 and this highlighted the need to increase the drawdown capacity of the reservoir.

The reasons for the slope failure are discussed in this paper and include the effects of the annual operational reservoir drawdown during the summer months. The major component of the remedial works was the flattening of the upstream slope of the dam to 1(V):5(H) using rock fill to give a satisfactory factor of safety.

The timing of the construction of the remedial works required detailed consideration to optimise construction activities without jeopardizing abstraction from the reservoir and operation of the water treatment works.