

## **Guidelines from hydraulic model tests on stepped masonry spillways**

M.J. WEARING, CRM Rainwater Drainage Consultancy Ltd, Bolton, UK

R BAKER, CRM Rainwater Drainage Consultancy Ltd, Bolton, UK

P. MASON, MWH, High Wycombe, UK

C. WINTER, MWH, High Wycombe, UK

---

**SYNOPSIS** As part of an Environment Agency funded project to produce new guidelines for stepped masonry spillways, laboratory tests were performed to investigate the pressure distribution on the spillway walls at the steps and to determine factors that would influence the failure of an individual masonry block.

Zones of high and low pressure were noted on the walls; on a real spillway these zones will typically be only a metre or so apart. If poor pointing allowed the positive pressure to be transferred to the back of the wall it is not inconceivable that it could push outwards on a block that is receiving suction pressures on the front face. On a typical UK spillway the difference between the peak positive pressure fluctuation at the back of the wall and the peak negative fluctuation on the front face could be in excess of 6m water pressure.

Pressure measurements around an instrumented block showed that the worst case was the loss of vertical pointing upstream of a block that stood slightly proud of its neighbours or downstream of a block that was indented compared to its neighbours. The data show that for a typical UK application, a block standing as little as 20mm out of line would be vulnerable to failure.