

Digital study of turbulent flows in the step-wise spillways

Very often, water supply engineering structures are fitted with exhaust devices with great slopes, which allow restore overflowing waters to watercourses. These structures called spillways consist of an overflow spillway crest, a discharge carrier and a stilling device.

The goal of the work is to simulate the discharge in the delimited layer of the upper area for the discharge carrier in order to locate the area where the natural discharge ventilation phenomenon appears and in order to highlight discharge and slope influence on this phenomenon.

The results prove that the step-wise spillways favor the discharge. The aerated discharge is nearing, in this case, the spillway sill.

The slope acts directly on aeration phenomenon, because experiments have shown that white water moves away from the sill with increasing slope.

The discharge also acts directly on the delimited layer, where its thickness is directly proportional to the discharge.

This work will surely help in the optimal design of such spillways, as far as energy aeration and dissipation are concerned.