

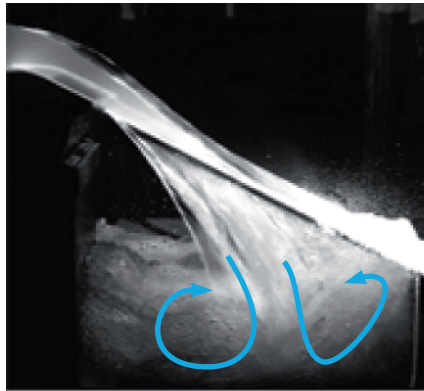
## Hydraulics of bottom racks

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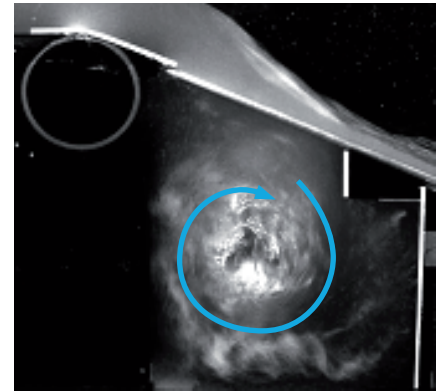
Bottom racks are a standard hydraulic structure used as intakes, to divert water to turbines, and to retain sediment and other solid matter larger than the rack spacing. Based on laboratory observations, the effects of various parameters were explored, such as the bottom slope, the rack geometry, and the rack porosity. In addition, a novel method to determine the discharge coefficient of a rack structure was developed. Finally, the intake channel below the bottom rack was investigated with features including a significant flow instability that may have a strongly adverse effect on the rack performance. Guidelines for successful rack designs are given, and the results of the present study may be readily applied.



Typical Flow Structure



Flow intake channel with two vortex structure



Flow intake channel with singular vortex

Keywords: Intakes, Hydraulics, Open channel flow

