

Study in a stilling basin with an end sill downstream of a stepped spillway: design criteria

Summary

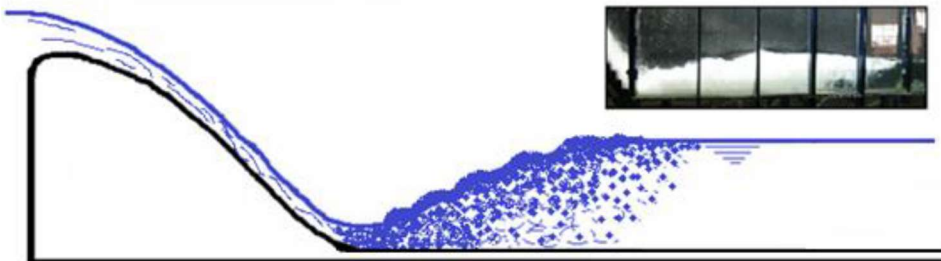
The application of end sills in stilling basins improves the performance of the structure in relation to the distribution of pressures and energy dissipation at the foot of the spillway, which can improve its efficiency. Studies show that, if correctly dimensioned, these accessories mitigate the impacts caused by the macroturbulent flow in addition to adequately accommodating the bounce within the dissipation basin. The present work addresses the results of a study carried out in stilling basins with triangular end sills, based on the analysis of pressure data at the bottom of the basin.

Analyzes were performed with Froude numbers between 5.98 and 7.44, with end sills of different heights and angles of inclination, placed in different positions in the basin downstream of a stepped spillway. With the analysis carried out, it was possible to evaluate the influence of the slope, height and positioning of the end sill on the flow behavior and thus determine criteria for the design of dissipation basins downstream of stepped spillways, contributing to more efficient and economical projects.

The results showed that the pressure fluctuations in the basin decrease with the insertion of end sills. Downstream of the basin it was possible to conclude that the fluctuations decrease as the end sill angle is reduced. Among the end sill positions studied, the equivalent of 1/2 of the spillway height showed the lowest values of maximum fluctuations.

Keywords

End sills, stilling basins, hydraulic jump, stepped spillway.



Classic hydraulic jump scheme. (Source: prepared by the author).



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