

Improving the Performance of DBE Structure in Pressure Flushing Using Submerged Vanes

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Abstract : Reservoir sedimentation is one of the main challenges by which the reservoir behind the dam is filled with sediments transferred through the river flow. Pressure flushing method is an effective way to drain the deposited sediments of the reservoirs through the bottom outlet. So far, several structural methods have been proposed to increase the efficiency of pressure flushing. The aim of this study is to increase the performance of Dendritic Bottomless Extended (DBE) structure on the efficiency of pressurized sediment flushing using submerged vanes. For this purpose, the physical model of the dam reservoir with dimensions of 7.5 m in length, 3.5 m in width, and 1.8 m in height in the hydraulic and water structures research laboratory of Shahid Bahonar University of Kerman was used. In order to investigate the influence of submerged vanes on the performance of DBE structure in pressure flushing, the best arrangement and geometric parameters of the vanes were selected and combined with the DBE structure. The results showed that the submerged vanes significantly increased the performance of the DBE structure so that the volume of the sediment flushing cone with the combination of two structures increased by 3.7 times compared to the DBE structure test.

Keywords : dendritic bottomless extended structure, flushing efficiency, sedimentation, sediment flushing

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