عنوان مقاله:

Investigation of the Effect of Berm Height in Bridge Piers on Reduction of Local Scouring using FLOW-3D Numerical Model

محل انتشار:

ششمین کنفرانس ملی و دومین کنفرانس بین المللی مصالح و سازه های نوین در مهندسی عمران (سال: 1396)

تعداد صفحات اصل مقاله: 6

نویسندگان:

N. Kardan - *Assistant Professor, Department of Civil Engineering, Azarbaijan Shahid Madani University*

F. Amanzadeh - *M.Sc. Student in Hydraulic Structures, Department of Civil Engineering, Azarbaijan Shahid Madani University*

M.H Behpour - *M.Sc. Student in Hydraulic Structures, Department of Civil Engineering, Azarbaijan Shahid Madani University*

خلاصه مقاله:

Local scouring is one of the most important factors causing damage and destruction of hydraulic structures. Therefore, taking necessary arrangements in controlling this complex phenomenon may be considered as an important endeavor in the field of river hydraulics. The formation of a scour hole around the bridge pier is mainly caused by the action of down flow on the upstream face of the pier and vortices at the base of the pier. Controlling these two parameters is one of the most common solutions to prevent the scour phenomenon. In the present study, the idea of berm usage in cylindrical bridge piers is investigated numerically as an effective solution in order to controlthe downward flow at the upstream of the pier. Therefore, the width of the berm was kept constant and its height was taken as a dependent variable. Solving the 3D Navier-Stocks as well as sediment transferring equations using Flow3d software is provided in order to do a numerical simulation of the turbulent flow and scouring of the sediment bed around the pier, respectively. The software has been designed in a wide range of applications for simulating three dimensional fluid dynamic behaviors using the finite volume method. The primary numerical model results revealed that increasing the height of berm may reduce the efficiency of its role in protecting the bed from erosion.

کلمات کلیدی:

Local scouring, Bridge pier, Berm, Flow-3D, Turbulence model