

THAMMAWAT KARULTANAKUL : LOCAL SCOUR AROUND ROW BRIDGE PIERS. THESIS  
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The study of local scour around row bridge piers is aimed at using physical hydraulics model to determine the relationships of row pier scour hole to flow behavior and bed sediment characteristics. Modeled cylindrical piers having the diameter of 4.8 cm. are used in this investigation . Rectangular flume of 18 m.long , 0.60 m.wide and 0.75 m. high attached with sand feeder is used as a flow channel and sediment generator. Pier spacings are set at 1 , 2 and 3 times of pier diameter , respectively. The study is performed using three different sizes of uniform sands including fine sand  $\phi$  0.36 mm. , medium sand  $\phi$  1.20 mm. and coarse sand  $\phi$  2.20 mm. under the flow conditions of clear water and live bed. Condition of flow for this study is maintained at steady-uniform and subcritical flow.

Based on results of the study, it has been found that effect of pier spacings on the depth of the first pier scour hole is very small and flow angles of attack also slightly effect the first pier scour hole. However, scour hole depths for the second and third piers are about 80% of the first scour hole. The ranges of the Froude Number and the  $y/D$  ratio of the experiment under clear-water condition are between 0.2-0.6 and 1-6 , respectively. For live-bed condition, the Froude Number ranges between 0.4-0.8 and the  $y/D$  ratio ranges between 1-2 .

The size of bed sediment significantly effects the depth of pier scour hole. Based on the same hydraulics of flow and the same pier characteristic, it has been found that smaller size of sediment produces deeper scour hole.

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