Isfahan University of Technology (IUT) Department of Civil Engineering
RIVER ENGINEERING 1404-1405 Term II
Assignment #4 Scouring Due: 16/03/1405

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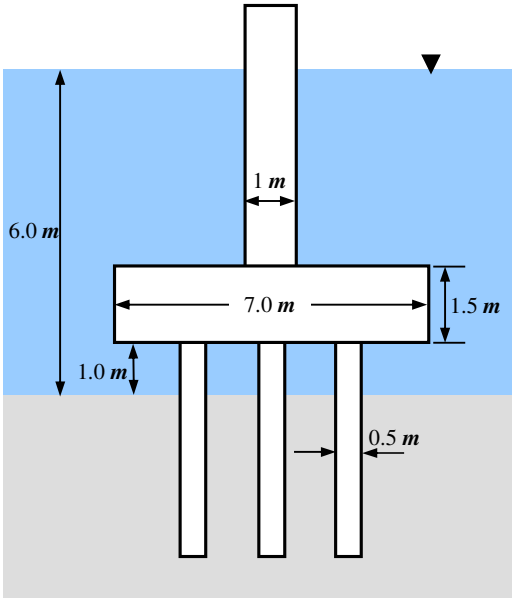
1 A stream restoration project is planned for a sand bed channel that is currently straight and extremely wide due to historic channelization and straightening. The channel will be narrowed by 20 percent. Given the following data, determine the contraction scour depth for clear-water and Live-bed conditions and recommend the appropriate value.

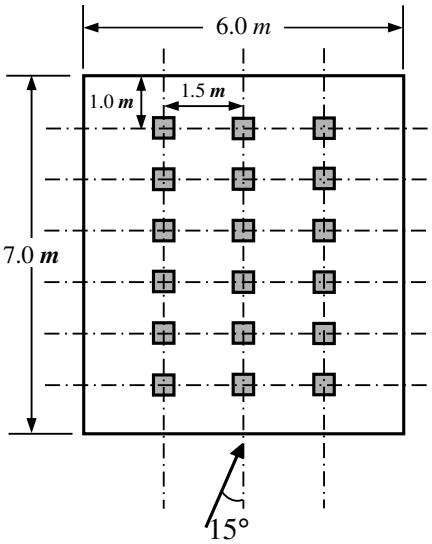
$S = 0.006$; $d_{50} = 1.0$ mm ; $Q = 2500$ m^3/s ; $D_0 = 2.7$ m ; $W = 80$ m

2 Use the Melville & Sutherland (1988) method to find the scour depth at a 1.0-m-diameter cylindrical pier under the following conditions: d_{50} = 3 mm, σ_g = 2.1, D_0 = 1.2 m, U = 1.0 m/s and $\alpha = 0$.

3 Calculate the scour depth for the complex pier shown below. It was determined that the water velocity would be 0.5 m/s for the Q_{100}.Use plane bed condition and d_{50} = 1.5 mm. The pile and pier stem cross sections are square.



Elevation View



Plan View