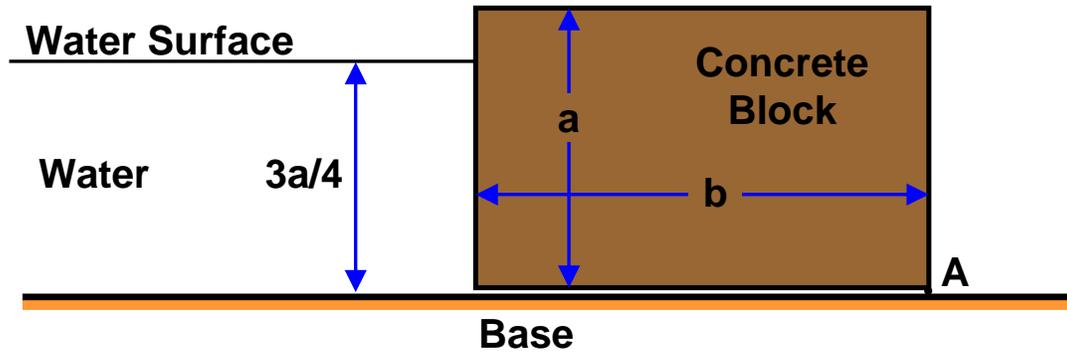


**Problem 104D**

A rectangular block of concrete (density 2.5 times that of water) is used as a retaining wall or dam for a reservoir of water:



The block has a height,  $a$ , a breadth,  $b$ , and the depth of the water is  $3a/4$ . Determine the ratio,  $b/a$ , below which the block will be overturned by the water. Assume the block does not slide on the base but could rotate about the point A. Also assume that water leakage is prevented by a seal at the point A so that there is a thin film of water under the block.