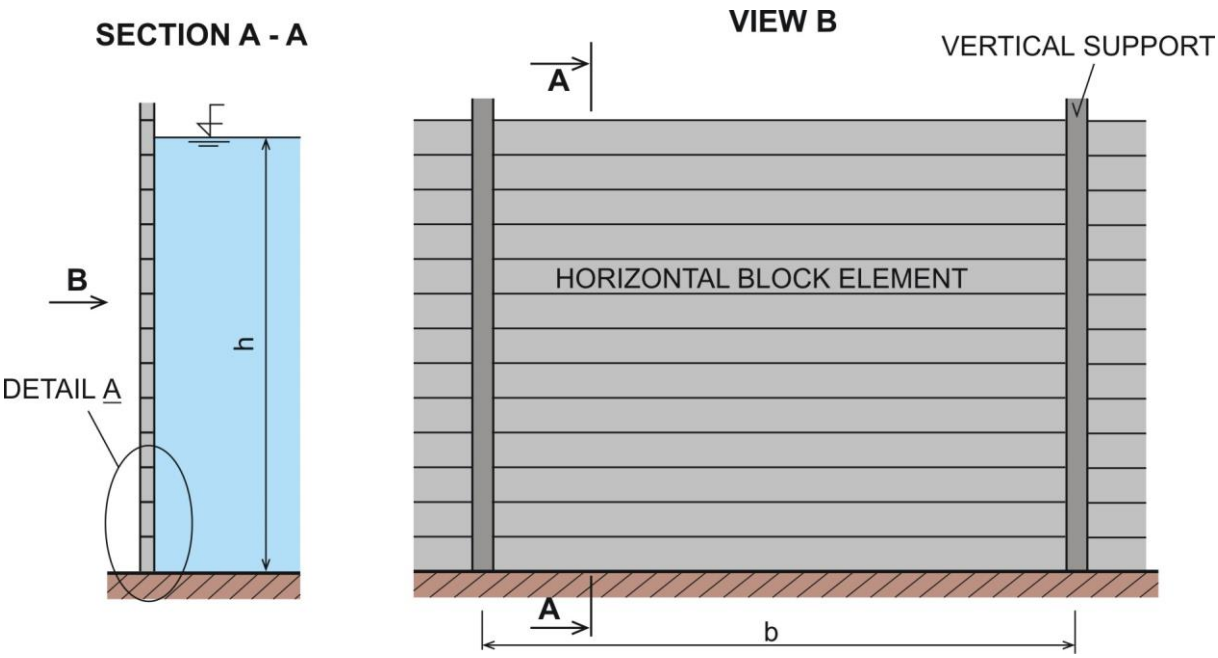
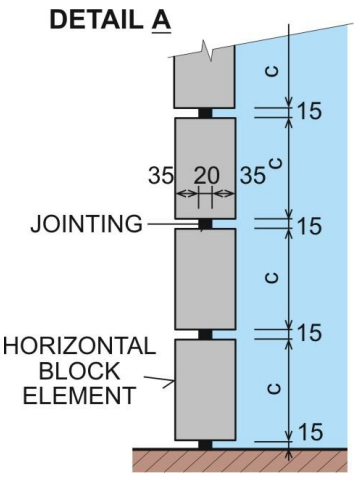
student's number **a** = ...

Homework No. 1: Hydrostatics

A mobile flood barrier (see figures below) consists of horizontal beams which slip into slots of the vertical support frame. Determine the maximum hydrostatic force acting on one beam (select the lowest one, because it carries the most load – the beams are interchangeable and thus they are all designed for this maximum load). Furthermore, determine the total hydrostatic force for which the vertical frame posts must be designed.
Also determine the minimum mass of the horizontal beam required to prevent its floating (friction with slots is neglected).

The depth of water is $h = \frac{60 - a}{30}\,[\mathrm{m}]$, the length (span) of the horizontal beams is $b = 2 + \frac{a}{10}\,[\mathrm{m}]$, their height is $c = 150 + 2 \cdot a\ [\mathrm{mm}]$.