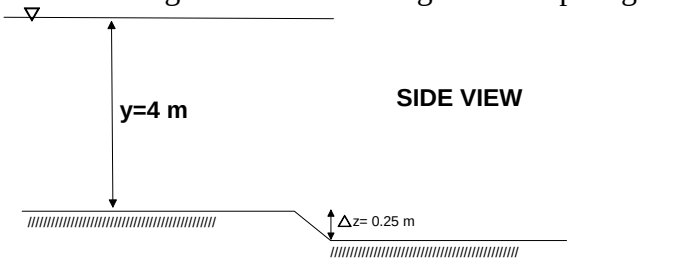
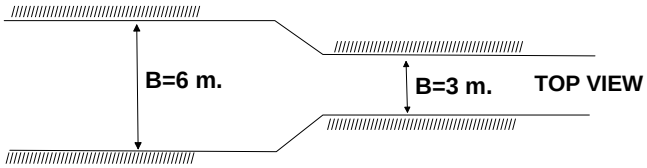
CE376 HYDROMECHANICS
HOMEWORK-VII
DUE DATE: 28.05.2020

Q1) Water is flowing with a discharge rate of Q=96 m^3/sec in a rectangular channel section of 4 m. in depth and 6 m. in width. There is a smooth downward step of 0.25 m. and a reduction of 3 m. in the channel width.

a)Calculate the water depths before and after the step.

b)If choking occurs, calculate the change in the step height to prevent the formation of choking and show on the figure the step height and water depths before and after the step.



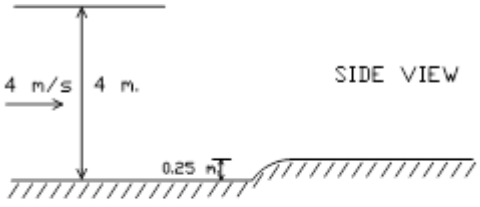


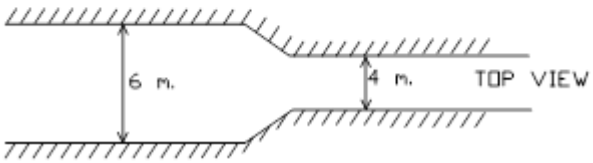
Q2)Water is flowing with a velocity of 4 m/s at a depth of 4 m. in a rectangular channel section of 6 m. width. There is a smooth upward step of 0.25 m. and a reduction of 2 m. in the channel width.

a)Calculate the water depths before and after the step.

b) Draw specific energy E versus water depth y curve and water surface profile showing all the computations and phenomenon.

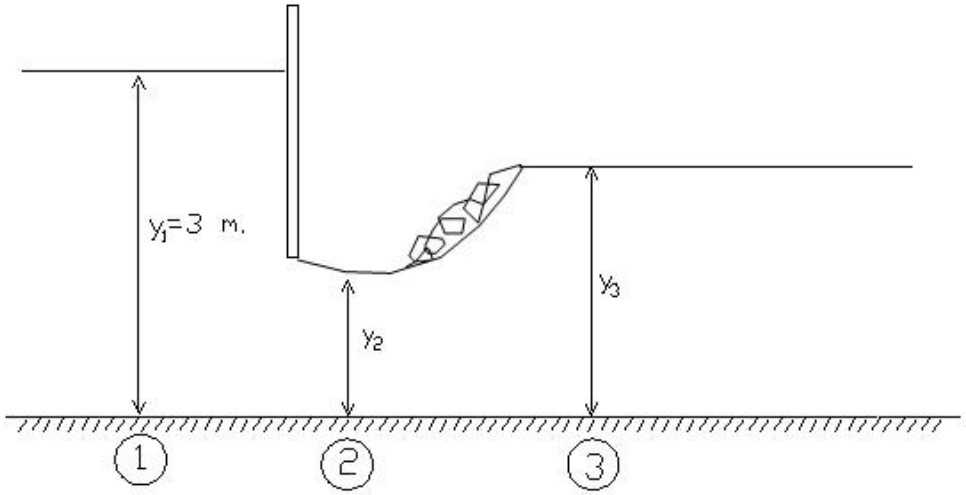
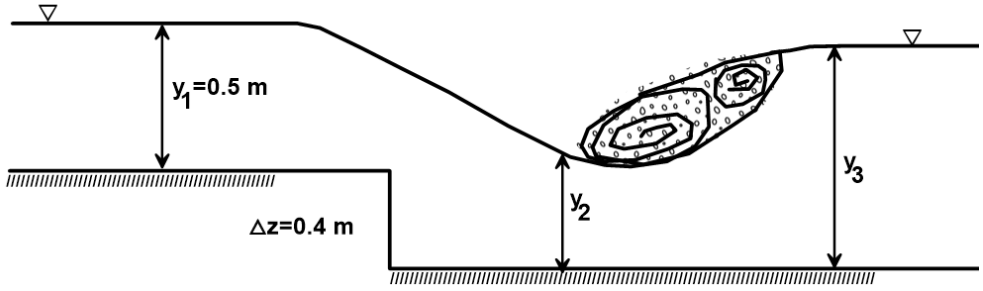
b)If choking occurs, calculate the change in the step height to prevent the formation of choking and show on the figure the step height and water depths before and after the step.





Q3) In a rectangular channel under a sluice gate, a hydraulic jump occurs. If the unit discharge rate is q=5 m^2/s and the water depth before the gate is y_1= 3m.;

a) Calculate water depths at section 2 and at section 3 (y_2 and y_3).
b) Show all the water depths **in specific force** and in **specific energy curves.** On the curves indicate the alternate and sequent water depths.
c) Find the force/width on the sluice gate, γ=10 KN/m^3.



Q4) In a rectangular channel with a downward step, a hydraulic jump occurs after the step. If the unit discharge q=2$m^3/s/m$, find conjugate depths(y_2 and y_3) of hydraulic jump and determine the force (per unit width) on the downward step. Draw the energy grade line (EGL) of the system.