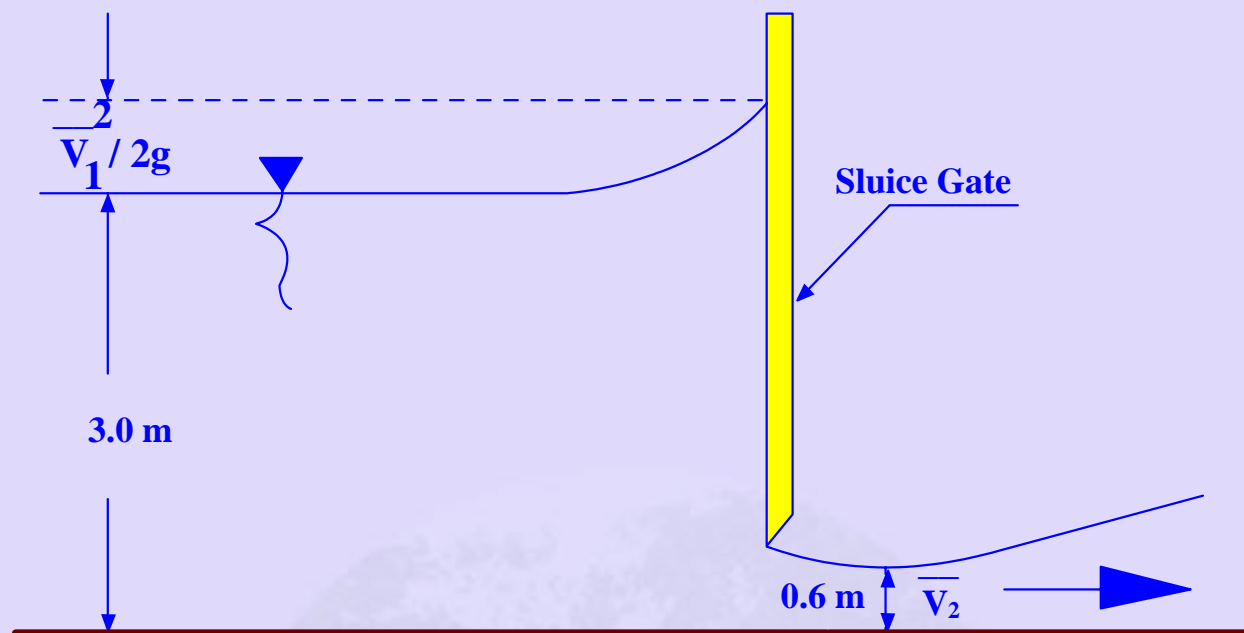


8.3 Problems

1. A rectangular channel, 9.15m wide carries $7.65 \text{ m}^3/\text{s}$ when flowing 915 mm deep. (a) What is the specific energy? (b) Is the flow sub critical or supercritical?
2. A trapezoidal channel has a bottom width of 6.0 m and side slopes of 2 horizontal to 1 vertical. When the depth of water is 1.07m, the flow is $10.50 \text{ m}^3/\text{s}$. (a) what is the specific energy?
(b) Is the flow sub critical or supercritical?
3. The discharge through a rectangular channel ($n = 0.012$) 4.60m wide is $11.30 \text{ m}^3/\text{s}$. When the slope is 1m in 100m, is the flow sub critical or supercritical?
4. A rectangular channel 3m wide, carries $11.3 \text{ m}^3/\text{s}$.
(a) Tabulate (as a preliminary for preparing a diagram) depth of flow against specific energy for depths from 0.30 m to 2.4m.
(b) Determine the minimum specific energy.
(c) What type of flow exists when the depth is 0.6m and when it is 2.4m?
(d) For $C = 55$, what slopes are necessary to maintain the depth in (c)?
5. Water flows at a Velocity of 1m/s and a depth of 0.25m in a rectangular channel. Find the critical depth. Find the alternate depths assuming no change in specific energy. 6. As shown in Figure, the depths at a short distance u/s and d/s of sluice gate in the horizontal channel are 3.0m and 0.60m respectively. The channel is rectangular in section and 3m wide. Find the discharge under the gate.



6. The depth of flow and flow velocity upstream of a 0.2 m sudden step rise in the bottom of 5 m wide rectangular channel are 5 m/s and 4 m/s respectively. Assuming there are no losses at the transition, determine,

- (i) The flow depth at downstream of the step and change in water level.
- (ii) The flow depth of water level downstream of the step if the channel bottom has drop of 0.2 m instead of rise.

