9.1 Review

- The hydraulic jump $\Rightarrow$ conservation of linear momentum
  \[
  \frac{y_2}{y_1} = \frac{-1 + \sqrt{1 + 8Fr^2}}{2}
  \]

- Broad-Crested Weir $\Rightarrow$ If we ignore energy losses and assume the upstream kinetic energy can also be ignored, on the broad crest we have
  \[
  y = y_c = \frac{2}{3}H
  \]
  and
  \[
  Q = \left(\frac{2}{3}\right)^{3/2} b\sqrt{gH^3}
  \]
  and allowing for losses:
  \[
  Q = C_{bw}b\sqrt{gH^3}
  \]
  where $C_{bw} < \left(\frac{2}{3}\right)^{3/2} = 0.544$ – see text for curve fit to data

9.2 General Topics Covered in CEE 3310

1. Viscosity and Shear Stress

2. Surface Tension & Vapor Pressure $\Rightarrow$ Cavitation

3. Kinematics – Streamlines and the Substantial derivative

4. Hydrostatics– Pressure distribution in a fluid at rest, Forces on plane and curved surfaces, Manometry, Buoyancy

5. Conservation of Mass, Continuity – Control Volume and Differential approach

6. Conservation of Momentum (Linear) – Control Volume approach

7. Conservation of Angular Momentum – Control Volume approach

© 2016 Edwin A. Cowen
8. Conservation of Energy – Control Volume approach ⇒ Bernoulli Equation EGL & HGL


11. Dimensional Analysis

12. Similitude and Modeling

13. Pipe Flow – Laminar and Turbulent, Minor and Major losses

14. Boundary Layer Flow – Laminar and Turbulent

15. Drag


© 2016 Edwin A. Cowen