

11/17

Assignment Due Date : One week from this lecture.

1. Design a trapezoidal channel with concrete lining with $Q = 20,000$ cfs; $b/y =$ best hydraulic section; $n = 0.013$; $z = 2$ and $S_0 = 0.0005$. Low Flow is 5 cfs. What is the critical depth in this channel?

2. Repeat Problem No. 1 based on a maximum velocity of 5 ft/sec with a Mannings n of 0.0225.

$b = y \left(\sqrt{z^2 + 1} - z \right), \quad z = \tan 60^\circ = 1.732$

$n = 0.013$; side slope = 2:1, $S_0 = 0.0005$

$Q = 20,000 \text{ cfs}$, $V = 5 \text{ ft/sec}$, $A = \frac{Q}{V} = 4,000 \text{ ft}^2$

$A = (b + zy)y = (b + 3.464y)y = 4,000$