

Q18-

$$\text{Longest travel time} = \frac{\sqrt{(1100)^2 + (1400)^2}}{(6)(60)} = 4.94 \text{ min}$$

$$\Rightarrow C = 0.85 \text{ (Table 12-1)}$$

$$\Rightarrow I = 6.4 \text{ in/hr (Fig 12-2)}$$

$$\Rightarrow Q = CIA = \frac{(6.4)(0.85)(154 \times 10^4)}{43560}$$

area = 1100 x 1400 = 154 x 10⁴

area في الفوتون ← 43560

$$\therefore Q = 192.3 \frac{\text{ft}^3}{\text{sec}}$$

$$Q = AV = 192.3 \Rightarrow 192.3 = \left(\frac{\pi D^2}{4}\right) \left(\frac{1.414}{0.012}\right) \left(\frac{D}{4}\right)^{\frac{2}{3}} \sqrt{0.02}$$

$$\therefore D = \del{3.8} \text{ ft} = 45.6 \text{ inch}$$

use 46 inch

Q 12.8

$$K = 0.5 \quad (\text{table 12-6})$$

$$L = 90 \text{ ft} \quad , \quad S = 0.01 \quad , \quad Q = 350 \text{ cfs}$$

$$A = 48 \text{ ft}^2$$

$$\Rightarrow R = \frac{48}{28} = 1.71 \text{ ft} \quad \Rightarrow V = Q/A = 7.29 \text{ fps}$$

$$H = 1.39 \quad [\text{from equation (12-9a)}]$$

$$d_c = \left(\frac{350^2}{32.2 \times 8^2} \right)^{\frac{1}{3}} = 3.90 \text{ ft} \quad \Rightarrow h_0 = \max \left\{ \begin{array}{l} 4.5 \\ (3.90 + 6)/2 \end{array} \right.$$

$$\checkmark h_0 = 4.95 \text{ ft}$$

$$\therefore HW = H + h_0 - SL = 1.39 + 4.95 - 0.9 = 5.44 \text{ ft}$$

$$\Rightarrow 5.44 < 6 \rightarrow \text{okay}$$