

Jason,

A quick look and it seems ok.

However, you assume that there is
no loss at the break (hole). This
loss could be significant. This only
makes your results a little conservative
so I don't see a big problem.

Chris

12/6/99

3/4/99

$$\frac{M \cdot T}{\sqrt{2g}} = \frac{7P}{H \cdot P} \cdot H -$$

$$H \cdot \frac{M \cdot T}{\sqrt{2g}} = \frac{7P}{H \cdot P} -$$

$$\sqrt{H \cdot \sqrt{2g}} = \frac{7P}{H \cdot P} \cdot M \cdot T -$$

$$\sqrt{H \cdot \sqrt{2g}} = 1$$

$$H \cdot \sqrt{2g} = 1$$

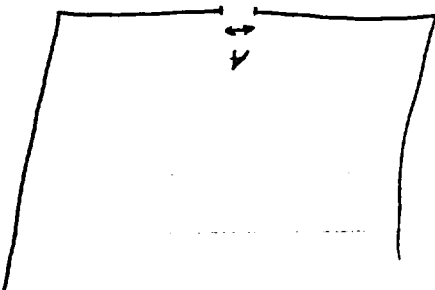
$$\sqrt{H \cdot \sqrt{2g}} = H \cdot \sqrt{2g}$$

$$1 \cdot 1 = \frac{7P}{H \cdot P} \cdot M \cdot T -$$

$$1 \cdot 1 = \frac{7P}{H \cdot M \cdot T} -$$

$$1 \cdot 1 = \frac{7P}{\text{Volume}} -$$

$$V \cdot \text{flow area} = \frac{7P}{\text{Volume}} -$$



$$t = \frac{A\sqrt{2g}}{2LW} (\sqrt{H(t)} - \sqrt{H(0)})$$

$$-t = \frac{A\sqrt{2g}}{2LW} (\sqrt{H(t)} - \sqrt{H(0)})$$

$$- \frac{A\sqrt{2g}}{2LW} t = 2 (\sqrt{H(t)} - \sqrt{H(0)})$$

$$2 (\sqrt{H(t)} - \sqrt{H(0)}) = - \frac{A\sqrt{2g}}{2LW} t$$

$$2 (\sqrt{H(t)}) = \frac{A\sqrt{2g}}{2LW} t$$

$$\frac{H^{1/2}}{t} = \frac{A\sqrt{2g}}{2LW}$$

$$\int_0^t H^{1/2} dt = \frac{A\sqrt{2g}}{2LW} t$$

$$H^{1/2} dt = \frac{A\sqrt{2g}}{2LW}$$

$$L = 30 \text{ ft}$$

$$W = 35 \text{ ft}$$

$$H(0) = 40 \text{ ft}$$

$$H(t) = 13 \text{ ft}$$

$$2'' \text{ diameter hole} \Rightarrow A = \frac{\pi}{4} D^2 = \frac{\pi}{4} \left(\frac{2}{12} \text{ ft} \right)^2 = .0218 \text{ ft}^2$$

$$8'' \text{ diameter hole} \Rightarrow \frac{\pi}{4} \left(\frac{8}{12} \text{ ft} \right)^2 = .349 \text{ ft}^2$$

$$\underline{\underline{2''}} \quad t = \frac{2 (30 \text{ ft}) (35 \text{ ft})}{(.0218 \text{ ft}^2) \sqrt{2 (32.2 \frac{\text{ft}}{\text{sec}^2})}} (\sqrt{40 \text{ ft}} - \sqrt{13 \text{ ft}})$$

$$t = \frac{262}{.0218} (2.72) \text{ sec} = \frac{712.4}{.0218} \text{ sec}$$

$$t = 32,678 \text{ sec} \times \frac{1 \text{ hr}}{3600 \text{ sec}} = \underline{\underline{9 \text{ hr}}}$$

$$\underline{\underline{8''}} \quad t = \frac{262 (2.72)}{.349} \times \left(\frac{1}{3600} \right) \text{ sec} = \underline{\underline{.567 \text{ hr}}}$$