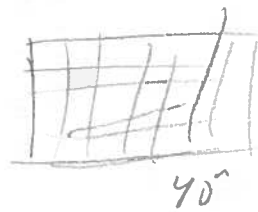


0 inlet open area = $A_T - A_{Bar} =$



25' $A_T = 2.08' \times 7.34' = 6.95 \text{ ft}^2$

$A_{Bar} = .083 \times = 5.2 \text{ ft}^2$

Bar width = $\frac{1}{2}'' = 0.042$

$9 \times 2.08 \times .042 + 13 \times 3.34 \times .042$

$= 1.56 \text{ ft}^2 + 3.6 \text{ ft}^2 = 5.2 \text{ ft}^2$
 $0.70 \text{ ft}^2 \quad 1.02 \quad 3.6 \text{ ft}^2 \quad 2.6 \text{ ft}^2$

inlet open area = $6.93 \text{ ft}^2 - 3.6 \text{ ft}^2 = 4.33 \text{ ft}^2 \times 0.85 = 3.7 \text{ ft}^2$

inlet open area = 3.7 ft^2

orifice eqn = $Q = C_d A \sqrt{2gh}$

$= 0.7 (3.7 \text{ ft}^2) \sqrt{2 (32.2 \text{ ft/s}^2) (1.65')}$

$= 2.6 \sqrt{106.26}$

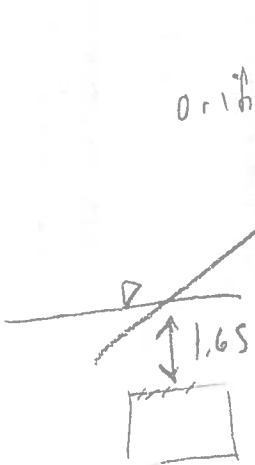
$= 2.6 \times 10.3$

$= 27 \text{ cfs}$

one inlet 1.65' of head

∴ 2 inlet w/ 1.65 head

$= 54 \text{ cfs}$



$$R_{ow} \quad 09.09 - 1' (\text{factor}) = 08.09 \text{ is}$$

controlling WSE

$$06.00 + 1.65 = 07.65 \text{ O/C}$$

$$07.64 + 1.65 = 09.29 \text{ Not O/C}$$

redo calcs

$$\text{gate at } 06.00 \rightarrow h = 2.09'$$

$$Q = 0.7 (3.7 \text{ ft}) \sqrt{2g (2.09')}$$

$$= 2.6 \sqrt{64 \times 2.09}$$

$$= 2.6 \times \sqrt{133.76}$$

$$= 2.6 \times 11.56$$

$$= 30 \text{ cfs}$$

$$\text{gate at } 07.64 \rightarrow h = 0.45'$$

$$Q = 2.6 \sqrt{64.4 (0.45)}$$

$$= 2.6 \times \sqrt{29.96}$$

$$= 2.6 \times 5.4$$

$$= 14 \text{ cfs}$$

$$\therefore 30 \text{ cfs} + 14 \text{ cfs} = 44 \text{ cfs} < 50 \text{ cfs}$$

So doesn't work

$\therefore$ need 7550 cu ft of storage between 08.09 and 09.09.

Pipe Calc 12-26-19

$$\text{Slope} = \frac{83.96 - 82.00}{3}$$

$$.0345 = \frac{1.96}{X}$$

$$X = \frac{1.96}{.0345} = 57' \quad \boxed{53' \text{ of pipe for } 3.45\%}$$

pipe is most likely steeper as doubtful then is
57' from manhole to inlet

inlet at downstream inlet should be lower
than inlet at upstream inlet by 0.1 ft

∴ upstream inlet at 84.00

∴ downstream inlet at 83.90

$$\begin{aligned} Q &= \frac{1.486}{n} (A)(R)^{2/3} (S)^{1/2} \\ &= \frac{1.486}{.013} (4.91) (0.625)^{2/3} (.0345)^{1/2} \\ &= \frac{1.486}{.013} (4.91) (0.73) (0.18) \end{aligned}$$

$$\boxed{720} \text{ cfs } @ 0.10$$

Pipe inlet 84.06

$$84.06 + 2.5' + 0.5' (\text{loss}) =$$

$$87.06$$

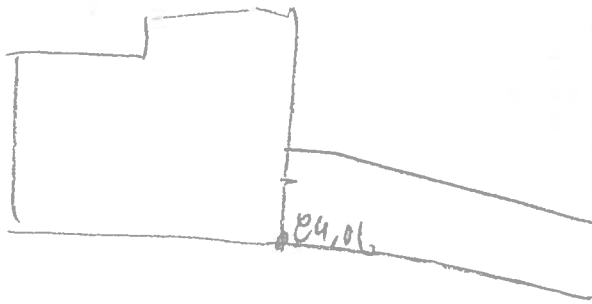
$$87.64 - 87.06 = 0.58' \text{ for gate}$$

Tight ball hits

check with Eq for 30' pw

88.04

5' - 1.25'



$$h = 5 \text{ ft}$$

$$Q = 0.7(4.91)(\sqrt{64.4 \times 3.75})$$

$$= 0.7(4.91)(\sqrt{242})$$

$$= 0.7(4.91)(15.6)$$

$$= 53 \text{ cfs} > 52.2 \text{ cfs OK}$$

Conclusion

