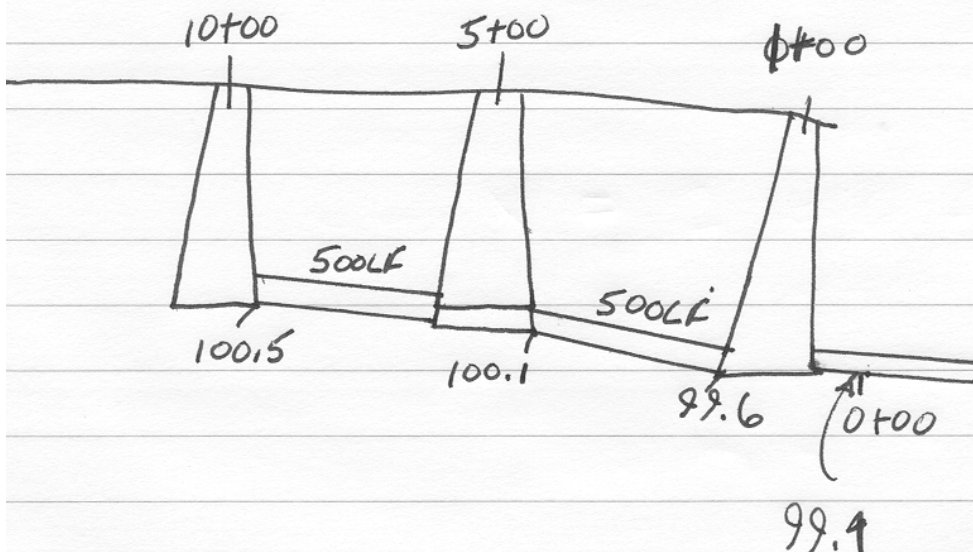
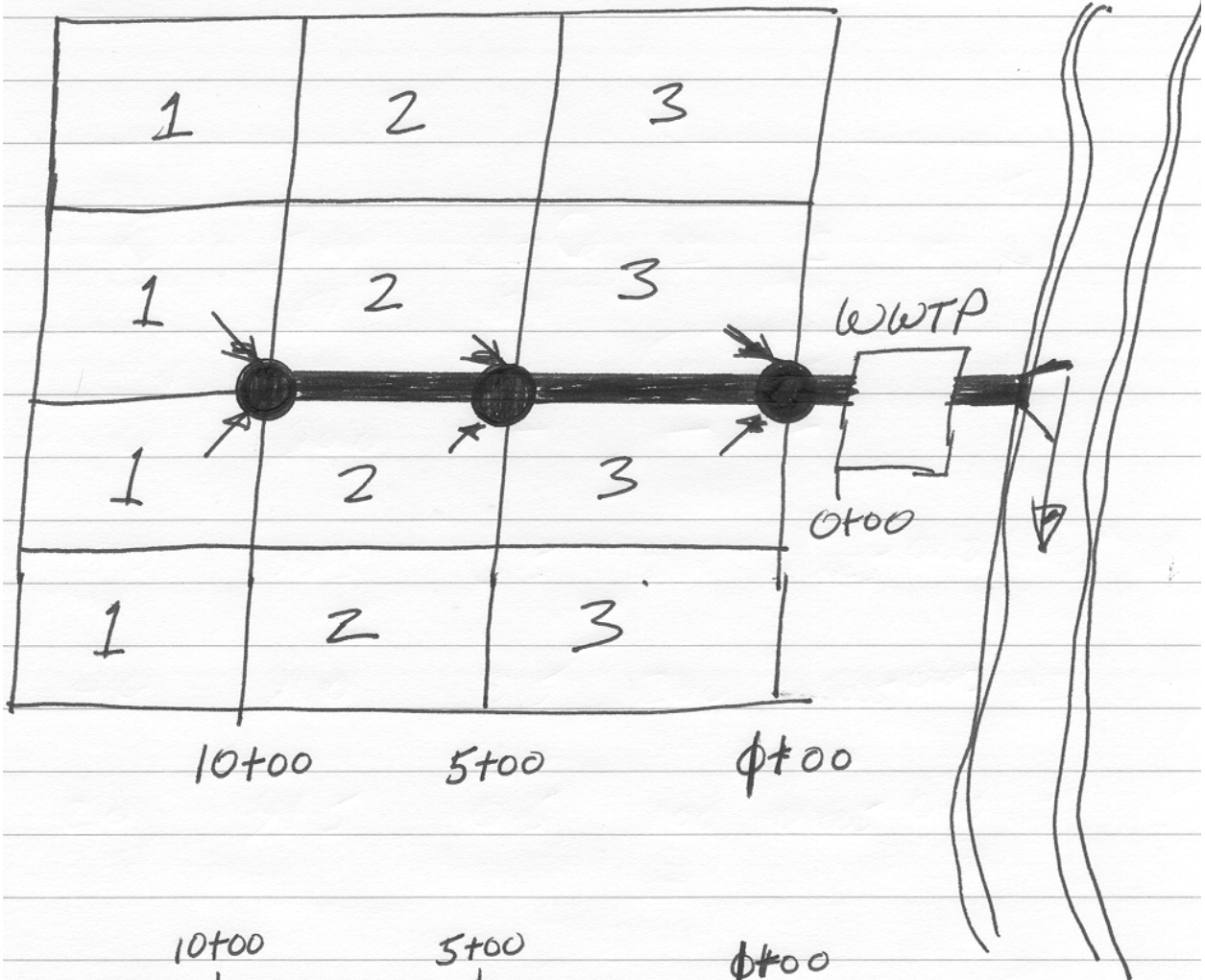


CIEG 440 Water Resources Engineering Sanitary Sewer Design



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Design Flow $\left(\begin{smallmatrix} \text{per capita} \\ \text{water use} \end{smallmatrix} \right) \left(\begin{smallmatrix} \text{wastewater} \\ \text{consumptive} \\ \text{use} \end{smallmatrix} \right) (PF)$

$$\begin{aligned} \textcircled{1} \quad & 5,000 \text{ population} \times (150 \text{ gpcd}) \times (0.9) \times (2.0) \\ &= (1,350,000 \text{ gpd}) \left(\frac{1 \text{ day}}{24 \text{ hr}} \right) \left(\frac{1 \text{ hr}}{60 \text{ min}} \right) \left(\frac{1 \text{ min}}{60 \text{ sec}} \right) \left(\frac{1 \text{ cfs}}{7.48 \text{ gpd}} \right) \\ &= 2.1 \text{ cfs} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 7,000 \text{ population} \times 150 \times 0.9 \times 2.0 \\ &= 1,890,000 \text{ gpd} = 2.9 \text{ cfs} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & 4,000 \text{ population} \times 150 \times 0.9 \times 2.0 \\ &= 1,080,000 \text{ gpd} = \overset{1.7}{\cancel{1.6}} \text{ cfs} \end{aligned}$$

Sanitary Sewer Design

Station	Q (cfs)	Inv. El. (ft)	Δ Inv. El. (ft)	L (ft)	S ($\frac{ft}{ft}$)	n	Find Dia. (in.)	Check V. (fps)
0+0		99.4						
1+0 10+0	$2.1 + 2.9 + 1.7 = 6.7$	99.6	0.2	100	0.002	0.013	21" choose 24"	2.2
5+00	$2.1 + 2.9 = 5.0$	100.1	0.5	400	0.0012	0.013	21"	
10+00	2.1	100.5	0.4	500	0.0008	0.013		