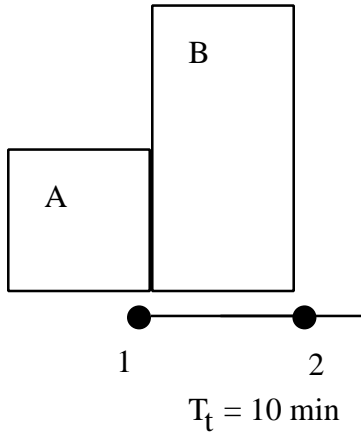


Storm Sewer Design Using the Rational Method

Example: 5-year design flow



Site	Area (ac)	C	Inlet Time (min)
A	10	0.8	10
B	20	0.5	30

$$i = \frac{105}{t + 15} \quad \text{5-year intensity}$$

Compute design discharges needed to convey the 5-year peak discharge.

Upstream Area (Manhole 1):

$$A = 10 \text{ ac}$$

$$C = 0.8$$

$$t_c = 10 \text{ min}$$

$$i = 105/(10+15) = 4.20 \text{ in/hr}$$

$$Q = CiA = (0.8)(4.20)(10) = 33.6 \text{ cfs}$$

Downstream Area (Manhole 2):

$$A = 10 + 20 = 30 \text{ ac}$$

$$C = (0.8(10) + 0.5(20))/30 = 0.6$$

$$\text{Time from A-1-2: } 10 + 10 = 20 \text{ min}$$

$$\text{Time from B-2: } 30 \text{ min}$$

$$t_c = 30 \text{ min}$$

$$i = 105/(30+15) = 2.33 \text{ in/hr}$$

$$Q = CiA = (0.6)(2.33)(30) = 41.9 \text{ cfs}$$