

Project: Sample CalculationBy: Jane DoeDate: 8/21/2001**A9 RATIONAL METHOD PIPE DESIGN FOR INLET CONTROL**

Type of Channel	Type of Channel	Type of Channel
<u>Concrete Channel</u> x <u>0.2</u>	<u>Grassed Channel</u> x <u>1.0</u>	<u>Overland Grass</u> x <u>2.0</u>
Elevation 1 <u>0</u>	Elevation 1 <u>3</u>	Elevation 1 <u>8</u>
Elevation 2 <u>3</u>	Elevation 2 <u>8</u>	Elevation 2 <u>15</u>
ΔY <u>3</u> ft	ΔY <u>5</u> ft	ΔY <u>7</u> ft
L <u>250</u> ft	L <u>250</u> ft	L <u>500</u> ft

TIME OF CONCENTRATION

$$T_c = \frac{3}{0.60} \text{ min.} \quad T_c = \frac{2.5}{2.50} \text{ min.} \quad T_c = \frac{4.7}{9.40} \text{ min.}$$

$$T_c \text{ total} = \boxed{12.50 \text{ min.}}$$

DETERMINATION OF "C" VALUEType of Land Use : 2/3 Single Family Residential, 0.30-0.50; 1/3 Neighborhood Business, 0.50-0.70Range = VariesChoose C = 0.41Reason for C : Distribution of 0.35 for Single Family Residential;
and 0.55 for Neighborhood Business**RAINFALL INTENSITY**Tc total = 12.5 min. Return Period 25 years

$$\text{Rainfall Intensity, I} = \boxed{6.35 \text{ in/hr}}$$

DRAINAGE AREAArea = 1,176,120 sq. ft. / 43,560

$$\text{Drainage Area} = \boxed{27.0 \text{ acres}}$$

DISCHARGE CALCULATION

$$Q = \frac{0.41}{C} \times \frac{6.35}{I \text{ (in/hr)}} \times \frac{27.0}{A \text{ (acres)}}$$

$$Q = \boxed{70.29 \text{ cfs}}$$

PIPE SIZE AND HEADWATER

For RCP & HDPE use : n = 0.012

HW/D = 0.95 (scaling factor)

$$n = \frac{0.012}{Q} \text{ s} = \frac{1.0}{5.80} \text{ %}$$

$$HW = \frac{0.95}{(HW/D)} \times \frac{48}{\text{Diameter}} / \frac{12}{\text{in}}$$

$$\text{Diameter} = \boxed{48 \text{ in.}}$$

$$\text{Velocity} = \boxed{5.80 \text{ ft/s}}$$

$$HW = \boxed{3.8 \text{ ft}}$$