EAH 225 HYDRAULICS

Open Drain Design

1. **Design Discharge Computation (Hydrology)**

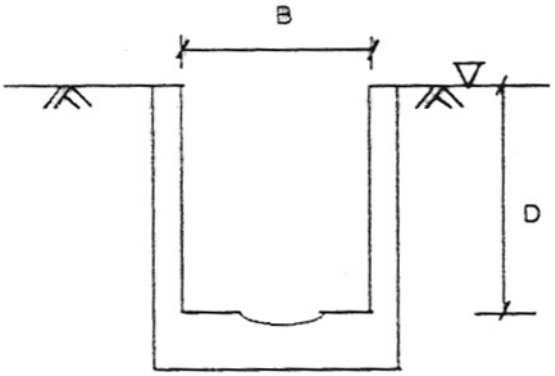
Catchment Area = 12 711 m^2 = 3.14 acres

C_s = 1
C = 0.85
I_5 = 5.5 inches

Q_5 = Cs . C . i . A
= 14.68 ft^3/s
= **0.42** **m^3/s**

2. **Drain Sizing Calculation**

Assume:



Drain Depth, D = 0.45 m

Width, B = 1.15 m

Required slope = 1 in 200

Manning's n = 0.013

For **bankfull flow**:

A = 0.5175 m^2

P = 2.05 m

$R^{2/3}$ = 0.8819

Slope S = 0.005

Design V = 1/n $R^{2/3}$ $S_o^{1/2}$
= 2.36 m/s i.e. within minimum **0.6 m/s** and maximum **4 m/s** limits

Design Q = **1.22 m^3/s** i.e. greater than the required peak discharge of **0.42 m^3/s**