3.3.2. Flow calculation

To calculate peak flow using the rational method, the following equation should be used:

$$Q = 2.77 \times 10^{-3} CiA$$

Where:

Q = peak flow (m^3/s)

C = the runoff coefficient

i = rainfall intensity (mm/hr)

A = catchment area (hectares)

3.4. Soil Conservation Service (SCS) Method

The SCS rainfall-runoff method is based on two components: a runoff equation and a unit hydrograph to route the runoff to the catchment outlet. The method should be used when the catchment area is greater than 80 ha.

3.4.1. Curve Number

The SCS method calculates runoff based on a series of runoff curves, which describe an initial storage followed by runoff increasing with rainfall. The initial infiltration and subsequent runoff is parameterised by a curve number. Runoff curves for different curve numbers are shown in Figure 3-6.

The initial storage in mm is given by:

$$I_a = 0.2 \times \left(\frac{1000}{CN} - 10 \right) \times 25.4$$

Once rainfall exceeds the initial storage, the depth of runoff in mm is given by:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

Where P is the rainfall in mm and S is the potential maximum soil moisture retention given in mm by:

$$S = \frac{25400}{CN} - 254$$

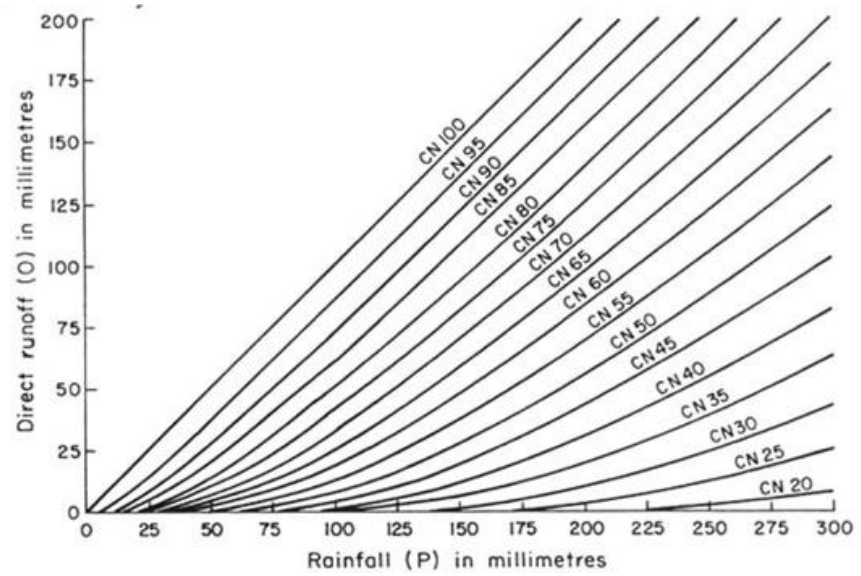

Figure 3-6 - Runoff curves for different SCS curve numbers