

From CIRIA (2015)

Equation 24.5 (Modified rational method equation to determine peak flow rates)

$$Q = 2.78 CiA$$

Where:

$Q$  = Design Event Peak Rate of Runoff

$C$  = Non-dimensional runoff coefficient (dependent on catchment characteristics)

$i$  = Rainfall Intensity for the design return period (in mm/hr)

$A$  = Total Catchment Area being drained

The runoff coefficient ( $C$ ) is a dimensionless parameter ranging from 0 to 1. It represents the ratio of surface runoff volume to total rainfall depth.

High Run Off  $C > 0.7$  : Asphalt, Concrete, Roofs

Moderate Run Off  $C = 0.3 - 0.7$  : Suburban areas, lawns, cultivated land

Low Run Off  $C < 0.3$  : Forested areas, woodlands, sandy soils.

For car park area assume  $C = 0.75$

Based on a 60 minute storm,  $i = 17 \text{ mm/h}$

$A$  is 1.01 hectares

$$\begin{aligned} Q &= 2.78 \times 0.75 \times 17 \times 1.01 \\ &= \underline{\underline{35.8 \text{ l/s}}} \end{aligned}$$