To calculate the time taken to pass through the storm water system, use the following method:

1. Prepare a preliminary layout of storm water network, taking account of the available discharge points. Mark pipe numbers on plan in accordance with numbering convention
2. Estimate the approximate gradients and pipe diameters for each pipe.
3. Estimate the pipe full velocity (V_f) using Manning's equation and a Manning's *n* value of 0.015:

$$V_f = \frac{1}{n}\left(\frac{D}{4}\right)^{2/3} S^{1/2}$$

D is the pipe diameter and S is the slope. Alternatively, the Colebrook White equation and the pipe roughness as specified in Section 4.3.1 can be used to estimate the pipe full velocity.

4. Calculate the time of flow for each main branch using $T_f=L/V_f$ where L is the length of the branch
5. Calculate the time of concentration for each main branch by adding the 'time of entry' to the 'time of flow' using V_f ($t_c = T_e + T_f$) and choose the branch giving the maximum t_c from the head of the storm water networks to the point of discharge. This time is then used to give the storm duration to be adopted.

3.2.4. Rainfall Intensity Duration Frequency (IDF)

The rainfall Intensity-Duration-Frequency (IDF) relationship provides the average intensity of rainfall during a storm event with a specified duration and frequency of occurrence (return period). The recommended IDF curves, tables and equations for DMAT are shown below in Figure 3-2, Figure 3-3, Table 3-4 and Table 3-5.