

Site Area = 3359 m²

Calculation of Runoff from the Proposed Development,

$$\begin{aligned}
 Q &= 0.278 C i A \\
 C &= 0.95 && \text{(P.42 of Stormwater Drainage Manual)} \\
 A &= 3359 \text{ m}^2 \\
 &= 0.003359 \text{ km}^2 \\
 \text{take } i &= 250 \text{ mm/hr} \\
 \text{Therefore, } Q &= 0.278 * 0.95 * 250 * 0.003359 \\
 &= 0.222 \text{ m}^3/\text{sec} \\
 &= \underline{\underline{13320}} \text{ lit/min}
 \end{aligned}$$

Calculation Maximum Capacity of Proposed 400mm dia. Underground pipe.

Manning Equation $V = R^{2/3} * S_f^{0.5} / n$

where $R = \frac{\pi r^2}{2 \pi r} = \frac{r}{2} = 0.1$ m

$n = 0.012$ s/m^{1/3} (Table 13 of Stormwater Drainage Manual)

1/ 75 $S_f = 0.0133$

Therefore, $V = \frac{0.1^{2/3} * 0.0133^{0.5}}{0.012} = 2.071$ m/sec

Maximum Capacity (Q_{max}) = $V * A$

$$\begin{aligned}
 &= 2.071 * \pi r^2 \\
 &= 0.260 \text{ m}^3/\text{sec} \\
 \text{1 nos of pipe} &= 0.260 \text{ m}^3/\text{sec} \\
 &= 15600 \text{ lit/min} \\
 &> 13320 \text{ lit/min}
 \end{aligned}$$

Provide 400mm dia underground pipe (1:75) is OK