Lyons O'Neill Structural Engineers	Project: 1 Cumberland Road				Job No: 24007	
The Ministry 79-81 Borough Road	Section: Surface Water Drainage, Soakaway Check				Sheet No:	
London SE1 1DN	By: GM	Date: 23/09/24	Chk'd by: MH	Date: 23/09/24	App'd by: KL	Date: 23/09/24

Cumberland calculations

1. Determination of the maximum depth of water for infiltration system

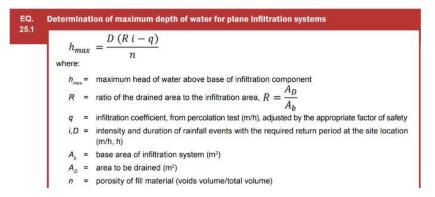


Figure 1 - Table 25.1 from CIRIA report C753 - The SuDS Manual

Data

$$\bullet \qquad A_d = 420m^2$$

$$\bullet \quad A_b = 16m^2$$

•
$$D = 24h$$

•
$$n = 0.95$$

Calculations

•
$$R = \frac{A_D}{A_h} = \frac{420}{16} = 26.25$$

•
$$q = 7.658x10^{-5} \frac{m}{s} = 0.276 \frac{m}{h} + FoS = 0.028 \, m/h$$

•
$$R = \frac{A_D}{A_b} = \frac{420}{16} = 26.25$$

• $q = 7.658x10^{-5} \frac{m}{s} = 0.276 \frac{m}{h} + FoS = 0.028 \, m/h$
• Considering Climate Change, $i = \frac{140}{24} \, mm/h = 0.006 m/h$

$$h_{max} = \frac{24h*(26.25*0.06\frac{m}{h} - \frac{0.028m}{h})}{0.95} = 3.27 m$$

NEED INFILTRATION THROUGH WALLS

Lyons	O Nell Structural Enginee				
The N	/inistry				
79-81 Borough Road					
Lor	ndon				
SE1	1DN				

Project: 1 Cumberland Road					Job No: 24007		
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2. Determination of maximum depth of water for 3D infiltration system

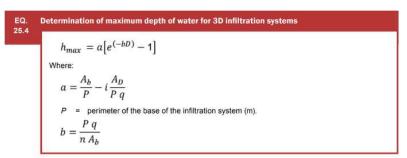


Figure 2 - Table 25.4 from CIRIA report C753 -The SuDS Manual

<u>Data</u>

- P = 16m
- $\bullet \quad A_d = 420m^2$
- $\bullet \quad A_b = 16m^2$
- D = 24h
- n = 0.95
- i = 0.006m/h
- n = 0.95
- R = 26.25
- $q = 0.028 \, m/h$

Calculations

$$a = \frac{16m^2}{16m} - 0.006 \, m/h * \frac{420m^2}{16m * 0.028 \, m/h} = -4.625$$

$$b = \frac{16m * 0.028 \, m/h}{0.95 * 16m^2} = 0.03$$

$$h_{max} = -4.625 * (e^{(-0.03*24)} - 1) = 2.37m$$