



The alternative drainage design software

http://www.mstdrain.co.uk.

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Job No.		
Sheet no. 1		
Date 24/09/10		
By IJ	Checked	Approved

MasterDrain
SW 12.23

Project	
Title	BRE365 Ring calculations for BUCKHURST HILL

Concrete ring design:-

Ring diameter = 2100 mm
Percentage voids = 30.0

Return period = 10
Imperm. area = 200

Depth below invert = 2
Pit side length = 2.5

Calculations :-

Surface area of soakaway to 50% depth - $a_{s50} = \text{Length of side} \times 4 \times \text{Depth}/2 = 10.0 \text{ m}^2$ (base not included).

Outflow factor - $\text{OFact} = a_{s50} \times f = 0.0001319 \text{ m}^3/\text{s}$ where Infiltr. factor (f) = 0.00002 m/s

Soakaway ring storage volume - $S_{\text{actual}} = \text{Pi} \times (\text{Ring diam}/2000)^2 \times \text{depth} = 6.9 \text{ m}^3$

Gross soakaway pit storage volume - $S_{\text{pit}} = \text{Length of side}^2 \times \text{depth} = 12.5 \text{ m}^3$

Nett soakaway pit storage volume - $S_{\text{nett}} = \text{Gross pit volume} - \text{infill} = 8.6 \text{ m}^3$ (storage + void)

Duration (hrs)	Rainfall mm/hr	Inflow m ³	Outflow m ³	Storage m ³	Void required	Stone vol m ³	Total vol m ³	Length m	Equiv Diam m	Emptying hrs
5 mins	109.7	1.8	0.1	1.7	-	-	-	2.5	2.8	2.4
10 mins	78.4	2.6	0.1	2.5	-	-	-	2.5	2.8	3.5
15 mins	61.8	3.1	0.2	2.9	-	-	-	2.5	2.8	4.0
30 mins	39.3	3.9	0.4	3.5	-	-	-	2.5	2.8	4.9
1 hrs	24.0	4.8	0.7	4.1	-	-	-	2.5	2.8	5.7
2 hrs	14.3	5.7	1.4	4.3	-	-	-	2.5	2.8	6.0
4 hrs	8.4	6.7	2.9	3.8	-	-	-	2.5	2.8	5.3
6 hrs	6.1	7.3	4.3	3.0	-	-	-	2.5	2.8	4.2
10 hrs	4.1	8.1	7.2	0.9	-	-	-	2.5	2.8	1.2
24 hrs	2.0	9.8	17.3	0.0	-	-	-	2.5	2.8	0.0

Required volume (S_{reqd}) = 0.0 m³

Emptying time to 50% volume = 0:0 (hr:min)

Soakaway side length excessive.

Soakaway emptying time OK.



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Project
Title BRE365 Ring calculations for BUCKHURST HILL

Location hydrological data (FSR):-

Location	= BUCKHURST HILL	Grid reference	= TQ4193
M5-60 (mm)	= 20	r	= 0.44
Soil index	= 0.45	SAAR (mm/yr)	= 600
WRAP	= 4	Area	= England and Wales

Soil classification for WRAP type 4
Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

N.B. The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.