MASTERDRAIN
The alternative drainage design software
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MasterDrain
SW 12.23

Job No.			
Sheet no.	1		
Date	24/09/10		
Project	By: IJ	Checked	Approved
Title: Trench soakaway calculations for BATH			

Data:-

Location hydrological data (FSR):-

Location	= BATH	Grid reference	= ST7464
M5-60 (mm)	= 20.7	r	= 0.36
Soil index	= 0.40	SAAR (mm/yr)	= 800
WRAP	= 3	Area = England and Wales	

Soil classification for WRAP type 3
i) Relatively impermeable soils in boulder and sedimentary clays, and in alluvium, especially in eastern England;
ii) Permeable soils with shallow ground water in low-lying areas;
iii) Mixed areas of permeable and impermeable soils, in approximately equal proportions.

Design data:-

Safety factor = 1.5 - No damage or inconvenience
Fill porosity = 0.45 - Clean stone (porosity = 0.4 - 0.5)
Equivalent porosity (n1) = 0.45

Area drained = 150 m²

Infiltration coefficient = 0.010 m/hr
Effective inf.coeff (q) = 0.0066667

Return period = 10 yrs

Climate change factor = 30%

Calculations :-

Perimeter of pit = (2 x Excavation Width)+(2 x Excavation Length)
Area of base = Excavation Width x Excavation Length
Temporary constant 'a'
= (Area of base / perimeter)-((AreaDrained x Rainfall depth /1000)/(Perimeter/Inf. coeff))
Temporary constant 'b' = (Perimeter/Inf. coeff) / (Area of base x porosity)
Hmax = a*((EXP(-1 x b x Duration of storm))-1)

Note: The Hmax calculation is iterated to a maximum value of Hmax.

Note: Duration of storm in hours, Rainfall depth in mm/hr x Climate Change factor.

Results :-

Emptying time to 50% volume = 14:31 (hr:min)

hMax (Depth) = 1.79 metres

Time to maximum = 11:01 hr:min

Rainfall at maximum = 5.36mm/hr

Width (m) = 0.9

Length (m) = 10.0

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

Formulae and methods from CIRIA 156.
Custom safety factor used in preference to CIRIA values.