



MasterDrain
SW 13.17

Civil Engineering Services

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By	PJS	Checked	Reviewed

Project	Kimberdale Wokingham
Title	Trench soakaway calculations for WOKINGHAM

Data:-

Location hydrological data (FSR):-

Location	= WOKINGHAM	Grid reference	= SU8068
M5-60 (mm)	= 18.6	r	= 0.41
Soil index	= 0.45	SAAR (mm/yr)	= 650
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.

Design data:-

Safety factor = 1.5 - No damage or inconvenience
Fill porosity = 0.95 - Plastic cells (porosity = 0.95)

Equivalent porosity (n1) = 0.95

Area drained = 190 m²

Infiltration coefficient = 0.01116 m/hr
Effective inf.coeff (q) = 0.00744

Return period = 100 yrs

Climate change factor = 40%

Calculations :-

Perimeter of pit = (2 x Excavation Width)+(2 x Excavation Length)
Area of base = Excavation Width x Excavation Length
Infiltration area = (Area of base)+(Perimeter of pit x Hmax)
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 = 31:60 (hr:min)

hMax (Depth) = 0.77 metres

Time to maximum = 17:01 hr:min

Rainfall at maximum = 5.77mm/hr

Width (m) = 7.0

Length (m) = 3.0

Total Infiltration area = 36.5m² (base area + sidewall area).

Total available volume = 15.46m³

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

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