



Nimbus Engineering Consultants Ltd

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Job No.
C2214

Sheet no.
1

Date
14/06/19

By
S.L

Checked

Reviewed

MasterDrain
SW 16.02

Project
65c Gravits Lane, Bognor Regis, West Sussex, PO21 5LW

Title
BRE365 Trench Soakaway Calculations

Rectangular pit design data:-

Pit length = 3 m
Depth below invert = .6 m
Imperm. area = 62 m²
Return period = 100 yrs

Pit width = 2.5 m
Percentage voids = 100.0%
Infiltr. factor = 0.0000254 m/s
Climate change = 40%

Calculations :-

Surface area of soakaway to 50% storage depth (not inc. base):-

$$a_{50} = 2 \times (\text{length} + \text{width}) \times \text{depth}/2 = 3.3 \text{ m}^2$$

Outflow factor :

$$O = a_{50} \times \text{Infiltration rate} = 0.0000838 \text{ m/s}$$

Soakaway storage volume :

$$S_{\text{actual}} = \text{length} \times \text{width} \times \text{depth} \times \% \text{voids}/100 = 4.5 \text{ m}^3$$

Duration	Rainfall mm/hr	Inflow m ³	Depth (hmax) m	Outflow m ³	Storage m ³
5 mins	190.0	1.0	0.13	0.03	0.95
10 mins	143.5	1.5	0.19	0.05	1.43
15 mins	117.4	1.8	0.23	0.08	1.75
30 mins	79.0	2.4	0.31	0.15	2.30
1 hrs	50.8	3.2	0.38	0.30	2.85
2 hrs	31.6	3.9	0.44	0.60	3.32
4 hrs	19.1	4.7	0.47	1.21	3.53
6 hrs	14.0	5.2	0.45	1.81	3.41
10 hrs	9.5	5.9	0.39	3.02	2.89
24 hrs	4.9	7.2	0.00	7.24	0.00

Actual volume : $S_{\text{actual}} = 4.500 \text{ m}^3$

Required volume : $S_{\text{reqd.}} = 3.530 \text{ m}^3$

Soakaway volume storage OK.

Minimum required a_{50} : 2.59 m²

Actual a_{50} : 3.30 m²

Minimum depth required: 0.47 m

Time to maximum 4 hrs

Emptying time to 50% volume = $t_{50} = S_{\text{reqd}} \times 0.5 / (a_{50} \times \text{Infiltration rate}) = 05:50 \text{ (hr:min)}$

Soakaway emptying time is OK.



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Sheet no. **2**

Date **14/06/19**

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Project **65c Gravits Lane, Bognor Regis, West Sussex, PO21 5LW**

Title **BRE365 Trench Soakaway Calculations**

By **S.L** Checked Reviewed

Location hydrological data (FSR):-

Location = BOGNOR REGIS
M5-60 (mm) = 18
Soil index = 0.40
WRAP = 3

Grid reference = SZ9399
r = 0.35
SAAR (mm/yr) = 720
Area = England and Wales

Soil classification for WRAP type 3

- Relatively impermeable soils in boulder and sedimentary clays, and in alluvium, especially in eastern England;
- Permeable soils with shallow ground water in low-lying areas;
- Mixed areas of permeable and impermeable soils, in approximately equal proportions.

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