



Gledsdale Associates Ltd
Consulting Structural Engineers

1 Greystones Close Kemsing,
Sevenoaks, Kent TN15 6QP

Fox & Hounds Site

Revision

Job No:

4481

Page:

C/01

Section:

Soakaway

Prepared By:

IG

Date:

24/04/2025

SUMMARY OF CALCULATIONS

critical design rainfall duration ' t_{crit} '	=	360	min
required storage volume ' V_{req} '	=	18.82	m^3
provided storage volume ' V_{prov} '	=	20.52	m^3
utilisation factor	=	0.92	.OK
required time to discharge 50% ' t_{50} '	=	16.10	hours
utilisation factor	=	0.67	.OK

GENERAL DATA

site location: **England and Wales**
soakaway type: **geocellular units**

impermeable area drained to soakaway ' A ' [m^2] = **293**
60 min rainfall depth of 5 year return period ' R ' [mm] = **20**
M5-60 to M5-2d rainfall ratio ' r ' = **0.50**
allowance for climate change: **30%**

SOAKAWAY DATA

soakaway width ' W ' [m] = **3.00**
soakaway length ' L ' [m] = **9.00**

total depth from ground level ' D_0 ' [m] = **1.40**
depth to drain invert level ' D_d ' [m] = **0.60**
soakaway effective depth ' D_{eff} ' [m] = **0.80**
free volume in infill aggregate [%] = **95**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base: **30%**
available on-site infiltration test results: ☒ Yes ☐ No
soil infiltration rate ' f ' [m/s] = **1.00E-05**

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M10-D			M50-D			M100-D			outflow from soakaway [m^3]	required storage [m^3]
			Z2	rainfalls [mm]	inflow [m^3]	Z2	rainfalls [mm]	inflow [m^3]	Z2	rainfalls [mm]	inflow [m^3]		
5	0.39	7.80	1.21	12.24	3.59	1.61	16.33	4.78	1.86	18.83	5.52	0.05	5.46
10	0.54	10.80	1.22	17.17	5.03	1.66	23.28	6.82	1.92	27.00	7.91	0.11	7.80
15	0.65	13.00	1.23	20.82	6.10	1.68	28.39	8.32	1.96	33.09	9.70	0.16	9.54
30	0.82	16.40	1.24	26.44	7.75	1.71	36.42	10.67	2.00	42.67	12.50	0.32	12.18
60	1.00	20.00	1.24	32.24	9.45	1.73	44.98	13.18	2.03	52.78	15.46	0.64	14.83
120	1.19	23.80	1.24	38.37	11.24	1.72	53.29	15.61	2.01	62.34	18.27	1.27	16.99
240	1.38	27.60	1.23	44.12	12.93	1.71	61.34	17.97	1.99	71.37	20.91	2.55	18.36
360	1.51	30.20	1.22	47.87	14.03	1.70	66.69	19.54	1.97	77.28	22.64	3.82	18.82
600	1.68	33.60	1.21	52.82	15.48	1.68	73.31	21.48	1.94	84.79	24.84	6.37	18.47
1440	2.03	40.60	1.19	62.74	18.38	1.64	86.37	25.31	1.89	99.50	29.15	15.29	13.86

* Z2 is growth factor from M5 rainfalls

Sustainable Drainage System Strategy

Site Address

Former Fox and Hounds Public House

26-27 London Road

Northfleet

Gravesend, DA11 9JH

23rd April 2025

Infiltration Testing

5no. trial pits were excavated to a maximum depths of up to 1.3mbgl (TP01 – TP05) for standard infiltration testing in accordance with BRE DG 365. The trial pits were rapidly filled with water from a 1.2m³ water bowser.

The maximum depth of the trial pits was 1.3mbgl, this was due to hard/dense ground conditions encountered and the excavation capabilities of the onsite plant machinery (1.5 tone excavator).

The trial pits were left to drain for a 24 - hour period or until nearly empty. The water level was continuously monitored using a water level logger. The water level achieved within the trial pits was used as the effective storage depth.

The infiltration rates obtained on site are available in Table 5 below. The average of TP01 – TP03 (1.0×10^{-5} m/s, 0.024m/hr) will be used throughout the report to allow for a conservative assessment of storage values.

Trial pits and associated depth and infiltration rate

Trial Pit	Depth	Infiltration Rate		Rate
		m/s	m/hr	
TP01	1.30	1.0×10^{-5}	0.028	Moderate
TP02	1.30	1.0×10^{-5}	0.026	Moderate
TP03	1.30	5.0×10^{-6}	0.018	Moderate
TP04	1.00	1.0×10^{-5}	0.029	Moderate
TP05	1.10	2.08×10^{-4}	7.5	Rapid