

Soakage Test Report

98 Elmer Road, Middleton-on-Sea

For

Alexey Likhoded

Rev -

Reference C1049

Date 12th April 2018

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Appendix A – Site Plan Showing Test Locations

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1. Introduction

CGS Civils Ltd have been appointed to undertake a soil infiltration test for a proposed site consisting of a new extension in Middleton-on-Sea, West Sussex.

1.1. Existing Site

The current site consists of an existing bungalow with front hard paved driveway and a garden to the rear.

Test pits were dug on site that revealed the site to be underlain by sandy clay.

2. Fieldwork

Fieldwork was carried out on 28th March 2018 and comprised one machine excavated pit at the front of the house to establish the groundwater level and one hand dug pit at the rear to establish the soakage rate.

Weather on the day was light to moderate rain.

The soakage testing was carried out in accordance with Building Research Establishment report (BRE 365) by filling the test section with water and recording the time taken for it to drain away. Periodic manual dipping was used to determine the depth of water at each interval. The pit was tested three times.

The results of each test are detailed below. A location plan for each test can be found in Appendix A.

2.1. Groundwater Test Pit 1 (TP1)

This pit was excavated to the following dimensions: 0.3m x 1.2m x 1.3m DP

Figure 1 TP1 Test Pit



Groundwater seepage was noted when excavating this pit. The pit was left and covered and after 4 hours had settled to 1.2m bgl.

2.2. Soakaway Test Pit 2 (TP2)

This pit was excavated to the following dimensions: 0.4m x 0.4m x 0.8m DP

Figure 2 TP2 Test Pit



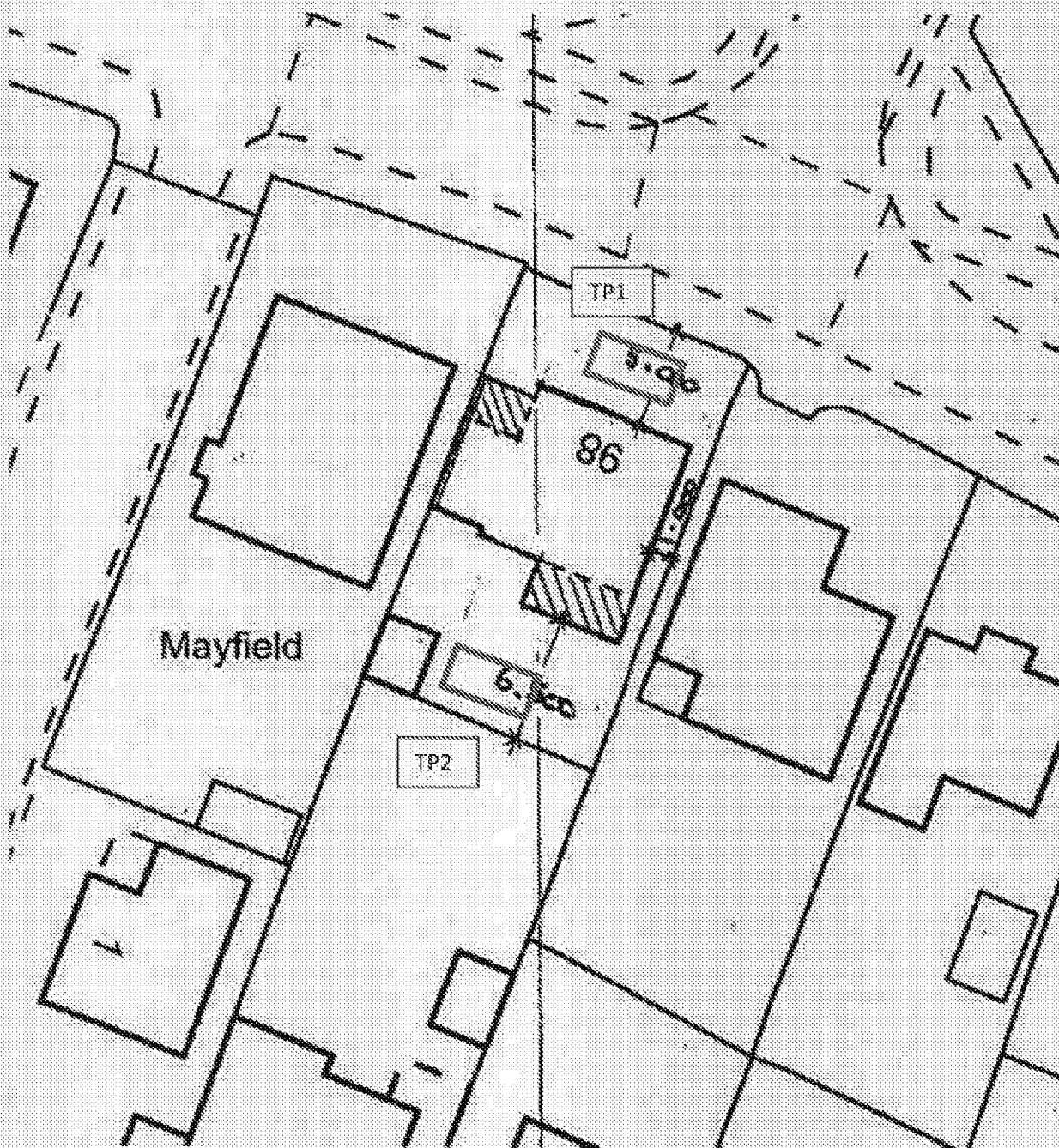
Three tests were undertaken on site and from the third test and using BRE 365 Guidance the rate was calculated at $1.53 \times 10^{-5} \text{m/s}$ which is deemed as being a moderate rate.

3. Conclusions

It is recommended for design purposes that the third recorded rate of $1.53 \times 10^{-4} \text{m/s}$ be used for soakaways. Due to the presence of a high groundwater table it is recommended that soakaways are kept as high as possible and to also consider the use of permeable paving.

Appendix A

Site Plan Indicating Test Locations



Appendix B

Soakage Data Log Sheets



Consulting Civil Engineers

Job: 98 Elmer Road, Middleton-on-Sea

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

V_{p75-25} = Effective storage volume between 75% and 25% effective depth

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.4
Trial pit depth	=	0.8
Trial pit length	=	0.4

a_{p50} = 0.72 m/squared

t_{p75-25} = 5800 seconds

V_{p75-25} = 0.064 m/cubed

F = **1.53E-05**

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 81 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	49.680	0.130	0.5	2.3	O K
30 min Summer	49.720	0.170	0.5	2.9	O K
60 min Summer	49.749	0.189	0.5	3.4	O K
120 min Summer	49.760	0.219	0.5	3.5	O K
180 min Summer	49.756	0.206	0.5	3.5	O K
240 min Summer	49.745	0.195	0.5	3.4	O K
360 min Summer	49.721	0.171	0.5	2.9	O K
480 min Summer	49.689	0.148	0.5	2.3	O K
600 min Summer	49.677	0.127	0.5	2.2	O K
720 min Summer	49.656	0.108	0.5	1.9	O K
960 min Summer	49.629	0.078	0.5	1.3	O K
1440 min Summer	49.599	0.049	0.5	0.8	O K
2160 min Summer	49.587	0.037	0.3	0.6	O K
2880 min Summer	49.580	0.030	0.3	0.5	O K
4320 min Summer	49.573	0.022	0.2	0.4	O K
5760 min Summer	49.568	0.018	0.2	0.3	O K
7200 min Summer	49.565	0.015	0.1	0.3	O K
8640 min Summer	49.563	0.013	0.1	0.2	O K
10080 min Summer	49.561	0.011	0.1	0.2	O K
15 min Winter	49.698	0.149	0.5	2.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	115.731	0.0	17
30 min Summer	77.804	0.0	32
60 min Summer	49.977	0.0	58
120 min Summer	38.956	0.0	98
180 min Summer	23.058	0.0	124
240 min Summer	18.677	0.0	158
360 min Summer	13.656	0.0	226
480 min Summer	10.974	0.0	290
600 min Summer	9.254	0.0	352
720 min Summer	8.046	0.0	412
960 min Summer	6.447	0.0	528
1440 min Summer	4.789	0.0	738
2160 min Summer	3.432	0.0	1104
2880 min Summer	2.739	0.0	1468
4320 min Summer	1.889	0.0	2206
5760 min Summer	1.583	0.0	2936
7200 min Summer	1.325	0.0	3609
8640 min Summer	1.147	0.0	4360
10080 min Summer	1.016	0.0	5080
15 min Winter	115.731	0.0	17

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Source Control 2015.1

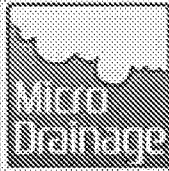
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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	49.748	0.196	0.5	3.4	OK
60 min Winter	49.781	0.231	0.5	4.0	OK
120 min Winter	49.791	0.241	0.5	4.1	OK
180 min Winter	49.783	0.233	0.5	4.0	OK
240 min Winter	49.766	0.218	0.5	3.7	OK
360 min Winter	49.728	0.178	0.5	2.1	OK
480 min Winter	49.692	0.142	0.5	2.4	OK
600 min Winter	49.660	0.110	0.5	1.9	OK
720 min Winter	49.633	0.083	0.5	1.4	OK
960 min Winter	49.600	0.050	0.5	0.9	OK
1440 min Winter	49.587	0.037	0.4	0.6	OK
2160 min Winter	49.577	0.027	0.3	0.5	OK
3600 min Winter	49.572	0.022	0.2	0.4	OK
4320 min Winter	49.566	0.018	0.1	0.3	OK
5760 min Winter	49.563	0.013	0.1	0.2	OK
7200 min Winter	49.561	0.011	0.1	0.2	OK
8640 min Winter	49.559	0.009	0.1	0.2	OK
10080 min Winter	49.558	0.006	0.1	0.1	OK

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	77.604	0.0	31
60 min Winter	49.937	0.0	58
120 min Winter	30.258	0.0	96
180 min Winter	23.059	0.0	136
240 min Winter	18.577	0.0	172
360 min Winter	13.858	0.0	244
480 min Winter	10.974	0.0	310
600 min Winter	9.254	0.0	370
720 min Winter	8.046	0.0	426
960 min Winter	6.447	0.0	510
1440 min Winter	4.709	0.0	750
2160 min Winter	3.432	0.0	1108
3600 min Winter	2.739	0.0	1472
4320 min Winter	1.989	0.0	2200
5760 min Winter	1.583	0.0	2920
7200 min Winter	1.325	0.0	3560
8640 min Winter	1.147	0.0	4280
10080 min Winter	1.015	0.0	5072

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 91 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	49.880	0.130	0.5	2.2	O K
30 min Summer	49.720	0.170	0.5	2.9	O K
60 min Summer	49.749	0.199	0.5	3.4	O K
120 min Summer	49.760	0.210	0.5	3.6	O K
180 min Summer	49.756	0.206	0.5	3.5	O K
240 min Summer	49.745	0.195	0.5	3.4	O K
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1440 min Summer	49.599	0.049	0.5	0.8	O K
2160 min Summer	49.567	0.037	0.3	0.6	O K
2880 min Summer	49.580	0.030	0.3	0.5	O K
4320 min Summer	49.572	0.022	0.2	0.4	O K
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Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	115.731	0.0	17
30 min Summer	77.804	0.0	31
60 min Summer	49.937	0.0	58
120 min Summer	30.856	0.0	80
180 min Summer	23.050	0.0	124
240 min Summer	18.577	0.0	158
360 min Summer	13.656	0.0	226
480 min Summer	10.974	0.0	290
600 min Summer	9.254	0.0	352
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4320 min Summer	1.989	0.0	2280
5760 min Summer	1.583	0.0	2938
7200 min Summer	1.325	0.0	3600
8640 min Summer	1.147	0.0	4380
10080 min Summer	1.015	0.0	5080
15 min Winter	115.731	0.0	17

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Summary of Results for 100 year Return Period (+30%)

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7200 min Winter	49.561	0.011	0.1	0.2	O K
8640 min Winter	49.559	0.009	0.1	0.2	O K
10080 min Winter	49.556	0.006	0.1	0.1	O K

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360 min Winter	13.656	0.0	244
480 min Winter	10.874	0.0	318
600 min Winter	8.254	0.0	378
720 min Winter	6.046	0.0	426
960 min Winter	4.447	0.0	518
1440 min Winter	4.709	0.0	750
2160 min Winter	3.432	0.0	1108
2880 min Winter	2.739	0.0	1472
4320 min Winter	1.989	0.0	2206
5760 min Winter	1.583	0.0	2938
7200 min Winter	1.325	0.0	3560
8640 min Winter	1.147	0.0	4286
10080 min Winter	1.015	0.0	5072

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Rainfall Details

Rainfall Model	FEP	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
MS-60 (mm)	19.800	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha): 0.013

Time (mins)	Area
From:	To: (ha)
0	4 0.013

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