

PROPOSED INFILTRATION TESTING & DESIGN CALCULATIONS

UPON

PROPOSED RESIDENTIAL DWELLING

LAND OFF EAUGATE ROAD, MOULTON EAUGATE,

SPALDING, LINCOLNSHIRE PE12 0XJ

PROJECT NO: SW 22-217

DOCUMENT REF: SW 22-217-CAL-C-01

Site investigations were carried out on the 8th June 2022. Percolation tests were undertaken in accordance with the method described within BRE digest 365 (2007 edition) and the test results are included within this document.

Shields Wilson drawing SW 22-217-10 shows the proposed foul and surface water drainage arrangement for the new dwelling. As the infiltration testing proved this method of surface water disposal is feasible for the site, soakaways have been designed for the roof catchment areas. Due to the size of the property 3 no. soakaways are proposed, and the sizing calculations are included within the document. The worse-case infiltration test result has been used for design purposes.

The proposed foul water drainage arrangement incorporates a foul water treatment plant. The treated outflow from the plant is to be discharged via infiltration. The proposed dwelling has 4 bedrooms however, due to its size could be easily altered to accommodate additional bedrooms at a later stage. Therefore, the treatment plant and soakaway have been based on a 6 bedroom house. In accordance with British Water – Flows and Loads 4, a 6 bedroom house has 8 person occupancy. The design calculations are included within this document.

Revision	Date	Description		
-	September 2022	First Issue	Prepared	M. Pett
			Approved	A.Wilson CEng MStructE

Infiltration Test Results

PROPOSED NEW DWELLING, EAUGATE ROAD, MOULTON EAUGATE

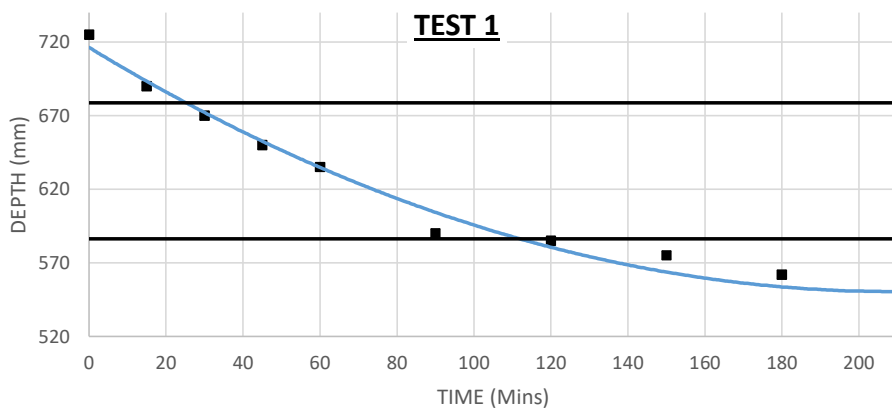
SA01	TEST 1	TEST 2
TIME (Mins)	DEPTH mm (d)	DEPTH mm (d)
0	725	705
15	690	685
30	670	670
45	650	660
60	635	650
90	590	643
120	585	635
150	575	620
180	562	615
210	540	595

INFILTRATION TEST - HOLE SA01

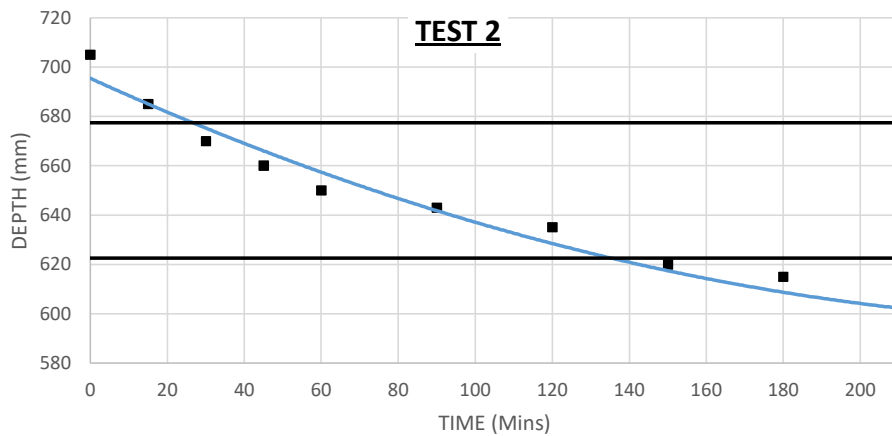
PROJECT NO. 22-217

SITE VISIT: 08/06/2022

TRIAL PIT DIMENSIONS (m)	
A [L]	2.50
B [W]	0.75
C [D]	1.10



SOIL INFILTRATION RATE, f	
TEST 1	
1.34177E-05 m/s	
0.048303713 m/h	



SOIL INFILTRATION RATE, f	
TEST 2	
7.12849E-06 m/s	
0.025662561 m/h	

Surface Water Soakaway Design Calculations

Job Details

SW22-217 - Proposed New Dwelling, Eaugate Road, Moulton Eaugate

Title

Soakaway sizing calculation - Area A

Calculated Infiltration Rate (m/s)

7.12849E-06

Design Rainfall - R	
M5-240	Z1
0.02	1.48
M10-D	Z2
0.0296	1.24

R = 0.036704 m

Inflow To Soakaway

Area (m ²)	x	R
101		0.036704

Inflow = 3.707104 m³

Outflow From Soakaway

Internal SA (50%)	Infiltration Rate	Storm Duration (s)		
12.8	7.12849E-06	240	60	14400

Outflow = 1.313923277 m³

Storage Required

Inflow -	Outflow	
3.707104	1.313923	2.393180723

Storage Volume With 30% Free (Required)

3.11113494

Actual Storage Volume

3.8

Soakaway Dimensions

Polystorm crates	Number	Total Lengths	Half Effective
Width	0.5	4	2
Length	1	5	5
Depth	0.4	1	0.4

Internal Surface Area Not Including Base (50% depth)

12.8 m²

Storage Volume

3.8 m³ (95% void ratio)

Soakaway Has Been Designed For A
10 Year Storm Of 240 Minute Duration

Half drain time = 5.6 OK

NB. Actual Storage Volume Needs To Be
Greater Than Storage Volume + 30%

Job Details

SW22-217 - Proposed New Dwelling, Eaugate Road, Moulton Eaugate

Title

Soakaway sizing calculation - Area B

Calculated Infiltration Rate (m/s)

7.12849E-06

Design Rainfall - R	
M5-240	Z1
0.02	1.48
M10-D	Z2
0.0296	1.24

R = 0.036704 m

Inflow To Soakaway

Area (m ²)	x	R
95		0.036704

Inflow = 3.48688 m³

Outflow From Soakaway

Internal SA (50%)	Infiltration Rate	Storm Duration (s)		
12	7.12849E-06	240	60	14400

Outflow = 1.231803072 m³

Storage Required

Inflow -	Outflow	
3.48688	1.231803	2.255076928

Storage Volume With 30% Free (Required)

2.931600006

Actual Storage Volume

3.42

Soakaway Dimensions

Polystorm crates	Number	Total Lengths	Half Effective
Width	0.5	3	1.5
Length	1	6	6
Depth	0.4	1	0.4

Internal Surface Area Not Including Base (50% depth)

12 m²

Storage Volume

3.42 m³ (95% void ratio)

Soakaway Has Been Designed For A
10 Year Storm Of 240 Minute Duration

Half drain time = 5.7 OK

NB. Actual Storage Volume Needs To Be
Greater Than Storage Volume + 30%

Job Details

SW22-217 - Proposed New Dwelling, Eaugate Road, Moulton Eaugate

Title

Soakaway sizing calculation - Area C

Calculated Infiltration Rate (m/s)

7.12849E-06

Design Rainfall - R	
M5-240	Z1
0.02	1.48
M10-D	Z2
0.0296	1.24

R = 0.036704 m

Inflow To Soakaway

Area (m ²)	x R
114	0.036704

Inflow = 4.184256 m³

Outflow From Soakaway

Internal SA (50%)	Infiltration Rate	Storm Duration (s)		
15.5	7.12849E-06	240	60	14400

Outflow = 1.591078968 m³

Storage Required

Inflow -	Outflow	
4.184256	1.591079	2.593177032

Storage Volume With 30% Free (Required)

3.371130142

Actual Storage Volume

4.75

Soakaway Dimensions

Polystorm crates	Number	Total Lengths	Half Effective
Width	0.5	5	2.5
Length	1	5	5
Depth	0.4	1	0.4

Internal Surface Area Not Including Base (50% depth)

15.5 m²

Storage Volume

4.75 m³ (95% void ratio)

Soakaway Has Been Designed For A
10 Year Storm Of 240 Minute Duration

Half drain time = 5.3 OK

NB. Actual Storage Volume Needs To Be
Greater Than Storage Volume + 30%

Treated Foul Water Soakaway Design Calculations

Job Details

SW22-217 - Proposed New Dwelling, Eugate Road, Moulton Eugate

Title

6 BED - Treatment Plant soakaway sizing calculation

Calculated Infiltration Rate (m/s)

7.12849E-06

Standard Residential:

150 litres / person / day

6 Bed House = 8 People

Therefore 1200 Litre Per Day

Data from British Water -
Flows and Load 4

Soakaway Dimensions

Polystorm crates	Number	Total Lengths	Half Effective
Width	0.5	2	1
Length	1	5	5
Depth	0.4	1	0.4

Internal Surface Area Not Including Base (50% depth)

7.4 m²

Storage Volume

1.9 m³ (95% void ratio)

Inflow = 1.2 m³

Soakaway Capacity Check

Storage Volume	Inflow
1.9	1.2

OK

Drain Down Time Check

6.319016376 Hours

OK

Less than 12 hours (2x safety factor)