



TOPPING ENGINEERS

CONSULTING CIVIL &
STRUCTURAL ENGINEERS

PERCOLATION TESTING REPORT

LOCATION:

Redwood Drive, Haxby

CLIENT: John Knowles

DOCUMENT REF:
21351-PTR-001

REVISION/DATE:
Revision A

CONTENTS & AMENDMENT HISTORY



1.0 TESTING REPORT 3
2.0 APPENDICES 4

Revision	Description	Date	Author	Checked
A	First Issue	Sept 2021	J Sellers	T Moorhouse

1.0 TESTING REPORT

The Percolation Testing was carried out on site on 2nd September 2021 to establish if infiltration methods were going to be a suitable solution for draining the site.

1 Trial Hole was formed with the following dimensions;

Test Pit 1 900mm x 600mm x 1200mm deep

The water level drop was monitored and recorded (see test sheets attached).

For Test 1 (Test Pit 1), water was filled to a depth of 450mm, the water level dropped 450mm after 1 hour of testing.

During the testing period, the water level dropped 450mm within two hours of testing.

For Test 2 (Test Pit 1), water was filled to a depth of 450mm, the water level dropped 450mm after 1 hour of testing.

During the testing period, the water level dropped 450mm within two hours of testing.

For Test 3 (Test Pit 1), water was filled to a depth of 450mm, the water level dropped 360mm after 2 hours of testing.

During the testing period, the water level dropped 360mm within two hours of testing.

Calculation sheet 1 shows that the infiltration rates are high enough and do satisfy BRE 365 requirements. Therefore, Infiltration methods of drainage will be viable for this site and strategy. Please see below a site location plan showing the location of the test pit 1.

Summary

Test 3 had the slowest infiltration rate of 9.13×10^{-2} m/hr. This infiltration rate meets the requirements for soakaways to work with the impermeable area of the site.



2.0 APPENDICES

Appendix A – Percolation Test Sheet

METHOD (from BRE Digest 365)

- Excavate a soakage trial pit to the required depth (typically 1.0m - 2.0m deep) using minimum width (0.3m) and length (1.0m). Carefully trim sides and bottom.
- Carefully measure size of pit and note sizes below.
- Fill soakage hole briskly with water (from bowser) to at least three quarters full. Being careful not to wash away the sides. (Note: a 0.3m wide, 1m long, 1.5m deep trench needs at least 350 litres (80 gallons) of water)
- Place straight edge over top of soakage pit and measure (dip) to the top of the water.
- Record time versus dips in table below. Dip every 5 minutes for the first hour and every hour until pit is one quarter full. Repeat test 3 times in total on the same or consecutive days.

DETAILS

Site Location	Redwood Drive, Haxby
Date of Test	02/09/2021
Weather Conditions	Dry - Summer
Engineer Name	James Sellers

SIZE OF PIT 1

Length	Width	Depth
1.7m	0.7m	1.00m

**Test 1
RESULTS**

Time (mins)	Dip (mm)
0	0
5	60
10	120
15	160
20	200
25	240
30	280
35	320
40	360
45	380
50	400
55	420
60	440
65	450

Appendix B
Percolation Test Sheet**Test 2****RESULTS**

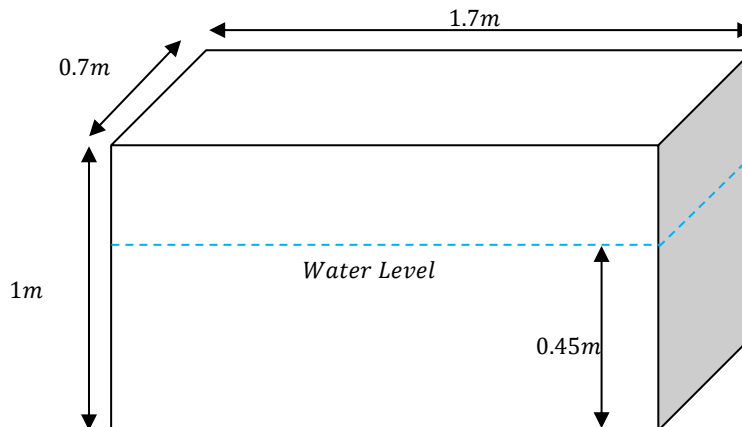
Time (mins)	Dip (mm)	Time (mins)	Dip (mm)
0	0	65	390
5	70	70	410
10	100	75	430
15	130	80	450
20	160		
25	190		
30	220		
35	250		
40	280		
45	310		
50	330		
55	350		
60	370		

Appendix C**Percolation Test Sheet****Test 3****RESULTS**

Time (mins)	Dip (mm)	Time (mins)	Dip (mm)	Time (mins)	Dip (min)
0	0	65	270	130	400
5	70	70	280	135	410
10	100	75	290	140	420
15	120	80	300	145	430
20	140	85	310	150	440
25	155	90	320	155	450
30	170	95	330		
35	185	100	340		
40	200	105	350		
45	215	110	360		
50	230	115	370		
55	245	120	380		
60	260	125	390		

Project				Job Ref.	
redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 2				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				

Test 2,
Test Pit 2)



Soil Infiltration rate(ms^{-1}):
$$\frac{V_{(P75-25)}}{t_{(P75-25)} \times a_{(P50)}}$$

V = Effective storage volume between 75 – 25%

$a_{(P50)}$ = Surface area of the pit (50% effective depth) + box area

$t_{(P75-25)}$ = Time for water to fall from 75 – 25%

$$V_{(p75-25)} = (0.45 \times 0.5) \times 1.7 \times 0.7 = 0.26775m^3$$

$$a_{(p50)} = 1.7 \times 0.7 + 2((0.45 \times 0.5) \times 1.7) + 2((0.45 \times 0.5) \times 0.7) = 2.27m^2$$

$$t_{(p75-25)} = 2400s$$

Soil Infiltration rate (m/s):

$$\frac{0.26775}{2400 \times 2.27} = 4.91 \times 10^{-5}m/s$$

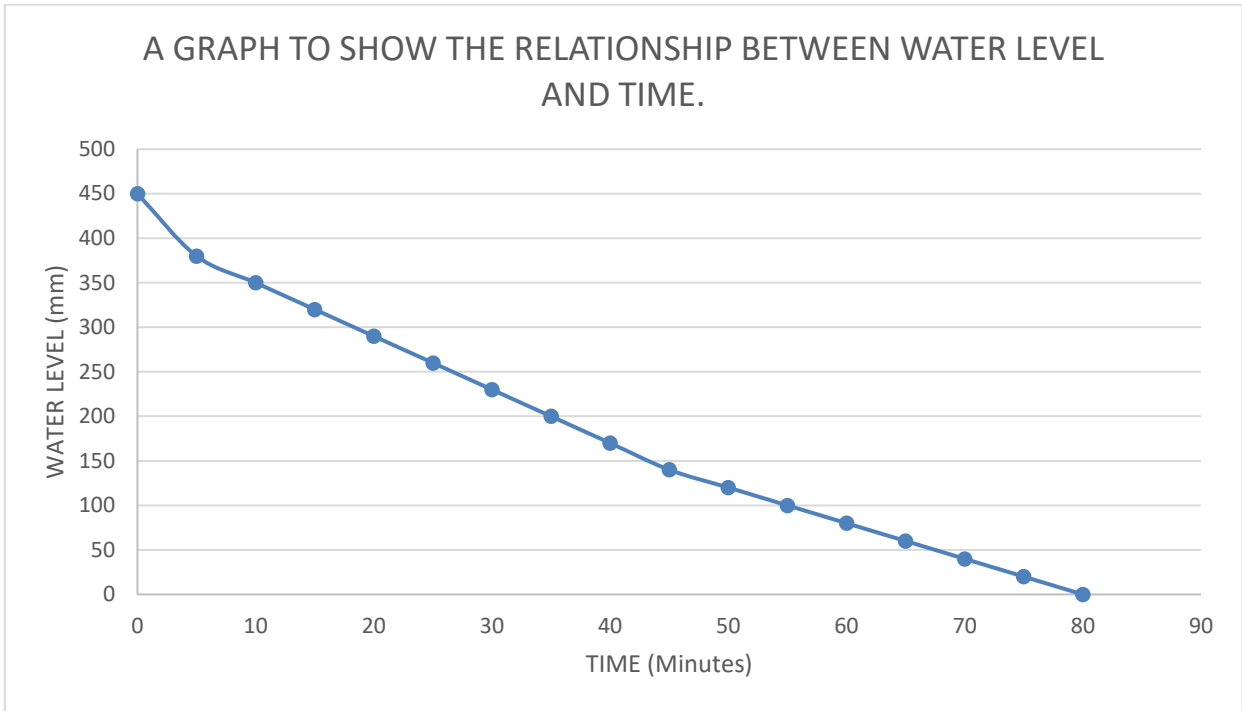
Soil Infiltration rate (m/hr):

$$4.91 \times 10^{-5} \times 3600 = 0.177 m/hr$$



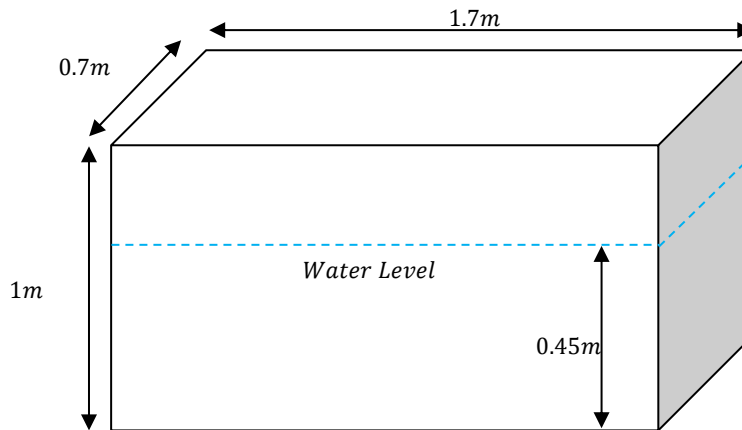
01423 522293

Project				Job Ref.	
redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 2				2	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				



Project				Job Ref.	
Redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 3				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				

Test 3,
Test Pit 3)



Soil Infiltration rate(ms^{-1}): $\frac{V_{(P75-25)}}{t_{(P75-25)} \times a_{(P50)}}$

V = Effective storage volume between 75 – 25%

$a_{(P50)}$ = Surface area of the pit (50% effective depth) + box area

$t_{(P75-25)}$ = Time for water to fall from 75 – 25%

$$V_{(p75-25)} = (0.45 \times 0.5) \times 1.7 \times 0.7 = 0.26775m^3$$

$$a_{(p50)} = 1.7 \times 0.7 + 2((0.45 \times 0.5) \times 1.7) + 2((0.45 \times 0.5) \times 0.7) = 2.27m^2$$

$$t_{(p75-25)} = 4650s$$

Soil Infiltration rate (m/s):

$$\frac{0.26775}{4650 \times 2.27} = 2.53 \times 10^{-5}m/s$$

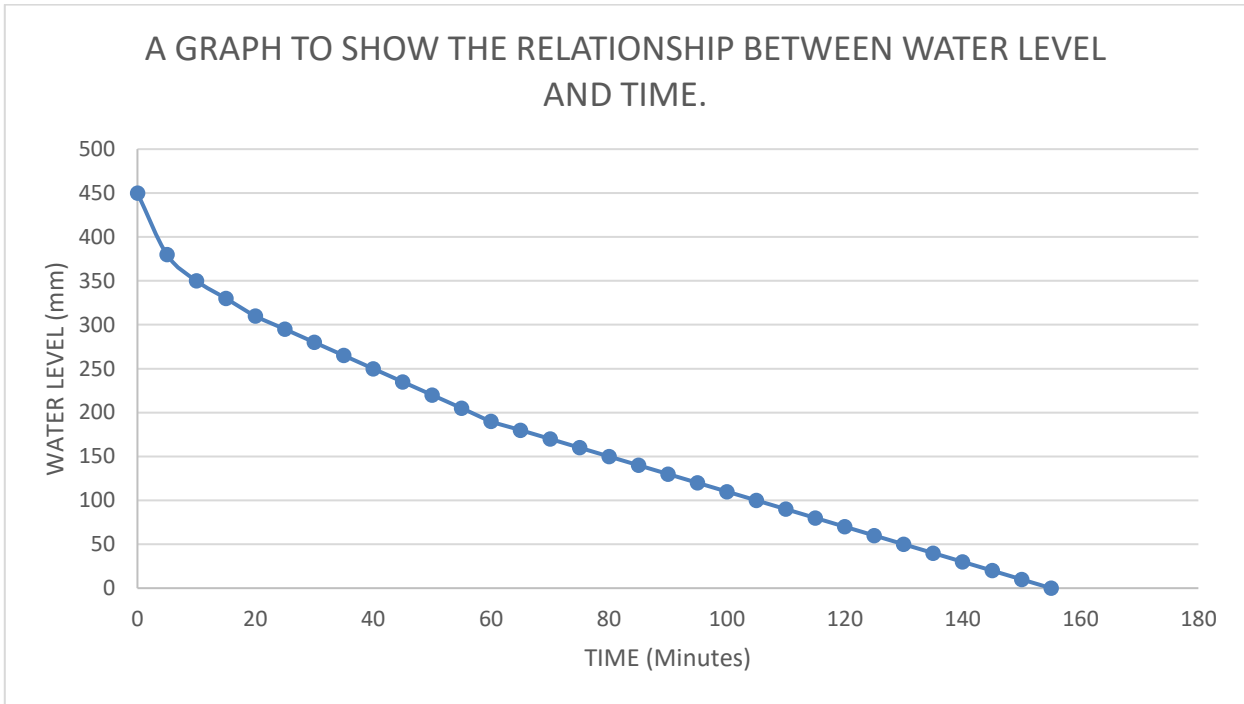
Soil Infiltration rate (m/hr):

$$2.53 \times 10^{-5} \times 3600 = 9.13 \times 10^{-2} m/hr$$



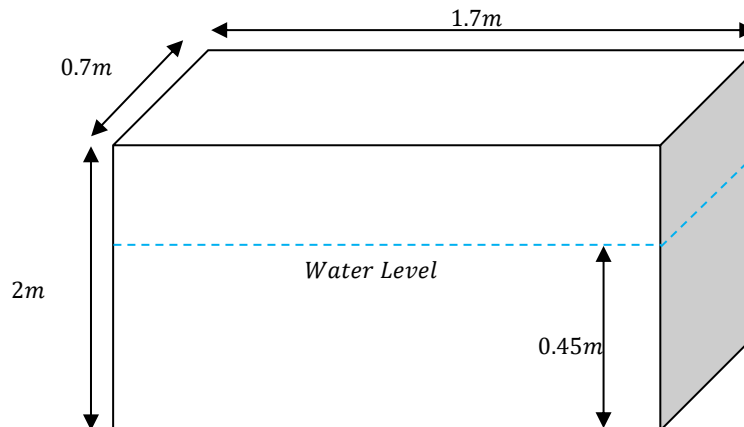
01423 522293

Project				Job Ref.	
Redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 3				2	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				



Project				Job Ref.	
Redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 1				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				

Test 1,
Test Pit 1)



Soil Infiltration rate(ms^{-1}):
$$\frac{V_{(P75-25)}}{t_{(P75-25)} \times a_{(P50)}}$$

V = Effective storage volume between 75 – 25%

$a_{(P50)}$ = Surface area of the pit (50% effective depth) + box area

$t_{(P75-25)}$ = Time for water to fall from 75 – 25%

$$V_{(p75-25)} = (0.45 \times 0.5) \times 1.7 \times 0.7 = 0.26775m^3$$

$$a_{(p50)} = 1.7 \times 0.7 + 2((0.45 \times 0.5) \times 1.7) + 2((0.45 \times 0.5) \times 0.7) = 2.27m^2$$

$$t_{(p75-25)} = 1950s$$

Soil Infiltration rate (m/s):

$$\frac{0.26775}{1950 \times 2.27} = 6.04 \times 10^{-5}m/s$$

Soil Infiltration rate (m/hr):

$$6.04 \times 10^{-5} \times 3600 = 0.218 m/hr$$



01423 522293

Project				Job Ref.	
Redwood Drive, Haxby				21351	
Section				Sheet no./rev.	
Test Pit 1				2	
Calc. by	Date	Chk'd by	Date	App'd by	Date
JS	06/09/2021				

