



SOIL INFILTRATION TESTING

CLIENT	RECTORY HOMES LIMITED
WORKS	SOIL INFILTRATION TESTING
SITE	SOUTH SIDE, STEEPLE ASTON, BICESTER OX25 4RY

PROJECT	REVISION	DATE
21-272.02	A	13 DECEMBER 2021

1.0 INTRODUCTION

At the instruction of Rectory Homes Limited [the Client], Aviron Associates Limited (Aviron) has undertaken soil infiltration testing in general accordance with Building Research Establishment (BRE) Digest D365 - 2016, Soakaway Design at the above referenced site.

This report follows Aviron's previously issued Exploratory Trial Pitting Investigation report, referenced 21-272.01 and dated 18 November 2021.

The outcome of the Exploratory Trial Pitting Investigation was an interpretation of ground conditions within thirteen machine excavated trial pits (TP201 to TP213) to generally term the strata encountered being generally termed as:




-  **Visibly drainable strata.** Such that there is a high coarse content of GRAVEL.
-  **Potentially drainable strata.** Such that GRAVEL is present though less dominant within the soil matrix.
-  **Negligibly permeable strata.** Such that SAND is present which given the density and the fine-grained clayey content was considered to be poor draining.

Figure 1 which is enclosed as **Appendix I** presented the above interpretation of strata, which enabled **Figure 2** to be provided to Aviron indicated soil infiltration test locations.

2.0 FIELD WORK

In accordance with our instructions five soil infiltration tests (ST1 to ST5) were commenced on 6 December 2021 at the locations illustrated in **Figure 2**, which is included as **Appendix I**. A sixth (ST6) was commenced on 7 December 2021.

Excavation of trial pits was completed using a 12-tonnes tracked machine.

With the benefit of previously completed trial pits and on-site observation a testing (pit excavation) depth of 1.6m bgl was selected for ST1, ST2, ST3, ST5 and ST6. ST4 was tested to 1.1m bgl. Upon completion of infiltration testing the pits were extended and deepened to prove the sub-crop of the underlying CLAY unit.

The **trial pits logs and photographs** are presented in **Appendix II** and general ground conditions encountered are presented within Table 1.

Aviron Associates Limited Head Office

Badgemore House – Badgemore Park – Gravel Hill – Henley on Thames – RG9 4NR

Contacts

T; 01491 413 722 - M: 07787 771 686 - F: 01491 413 722 - E: james@aviron.co.uk - W: www.aviron.co.uk

Registered Office

Herschel House, 58 Herschel Street, Slough, Berkshire, SL1 1PG

Company no. 06471253 - VAT no. 929 5083 96

Table 1 : Summary of Ground Conditions Encountered

Dark brown, sandy, gravelly SILT (TOPSOIL) where gravel inclusion were pebbles of various lithics. The TOPSOIL unit was logged to depths of 0.3m bgl .
Brown, slightly gravelly CLAY of the Oolite Group where gravel inclusions were limestone was encountered and proven to depths of between 0.5m and 0.6m bgl though absent in ST5.
Light brown, sandy cobbly GRAVEL of the Oolite Group where gravel inclusions were limestone was encountered and proven to depths of between 2.0m and 2.2m bgl within ST1-ST3, ST5 + ST6 and to depths of 1.6m bgl in ST4.
Beneath the overlying GRAVEL strata is a unit of grey and brown CLAY which was proven to depths of up to 2.3m bgl

Groundwater was not encountered during the excavation of trial pits.

3.0 SOIL INFILTRATION TESTS

Trial pits ST1 to ST6 were filled with drinking water standard water rapidly pumped from a road-going tanker. The subsequent fall in water level was recorded against time over the period specified within the results which are presented in **Appendix III**. The calculation sheets for tests completed are also enclosed as **Appendix III** and summarise in table 3.0 are the soil infiltration rates.



Table 3.0 : Soil Infiltration Rates

Location (Test no.)	Testing depths (m bgl)	Strata Tested	Infiltration Rate (m/s)	Comments
ST1 (1)	0.68-1.6	GRAVEL	2.07x10 ⁻⁵	
ST1 (2)	0.69-1.6	GRAVEL	1.09x10 ⁻⁵	
ST1 (3)	0.68-1.6	GRAVEL	9.11x10 ⁻⁶	
ST2 (1)	0.69-1.6	GRAVEL	1.45x10 ⁻⁵	
ST2 (2)	0.7-1.6	GRAVEL	1.09x10 ⁻⁶	Unreliable rate. Test was allowed to drain 'un-monitored' overnight to complete a compliant 3-fill/drain test; such that test 3 would be completed within a pit which had been saturated twice.
ST2 (3)	0.68-1.6	GRAVEL	6.56x10 ⁻⁶	
ST3 (1)	0.69-1.6	GRAVEL	8.25x10 ⁻⁵	
ST3 (2)	0.68-1.6	GRAVEL	4.93x10 ⁻⁵	
ST3 (3)	0.68-1.6	GRAVEL	3.20x10 ⁻⁵	
ST4 (1)	0.59-1.1	GRAVEL	2.66x10 ⁻⁶	Tested over 2-days and un-monitored over-night.
ST4 (2)	0.59-1.1	GRAVEL	NR	No Result. Test did not reach 25% full.
ST5 (1)	0.69-1.6	GRAVEL	4.25x10 ⁻⁶	Result extrapolated. Tested for c.7 hours and pit re-filled at the end of working day to enable a 2 nd (un-monitored) over-night drain. Accordingly, the curve extended to extrapolate and determine an infiltration rate.
ST5 (2)	0.68-1.6	GRAVEL	4.15x10 ⁻⁶	Unreliable rate. Test was allowed to drain 'un-monitored' overnight to complete a compliant 3-fill/drain test; such that test 3 would be completed within a pit which had been saturated twice.
ST5 (3)	0.68-1.6	GRAVEL	3.11x10 ⁻⁶	Result extrapolated. Tested for c.6 hours with testing ceasing at the end of the working day in darkness.
ST6 (1)	0.69-1.6	GRAVEL	1.49x10 ⁻⁵	Completed on 2 nd day for the benefit of obtaining additional indicative data. Insufficient site time to complete 3no. fill/drain testing.



The rates provided should be presented to the project's drainage engineer to review drainage design.

Notwithstanding, reasonable groundwater monitoring (typically Nov, Dec, Jan, Feb, Mar, Apr – wet months) to establish if at least 1m of free board (unsaturated and drainable strata) exists beneath the base of infiltration devices (soakaways) may need to be considered.

Prepared by

James Burkitt BEng (Hons) CEnv MRICS
Managing Director



APPENDIX I






FIGURE 1 – STRATA INTERPRETATION PLAN

FIGURE 2 – SOIL INFILTRATION TEST LOCATION PLAN





Legend

-  Site Boundary
-  Mechanical Trial Pit
-  Visibly drainable strata
-  Potentially drainable strata
-  Negligibly permeable strata

Notes

Produced following Exploratory Trial Pitting Investigation

Figure 1

Drawing Title

Strata Interpretation Plan

Project Number 21-272.02

Project Title

South Side, Steeple Aston, Bicester OX25 4RY

Drawn by CB







Checked by JB

Scale NTS





Legend

-  Site Boundary
-  Mechanical Trial Pit
-  Visibly drainable strata
-  Potentially drainable strata
-  Negligibly permeable strata
-  Infiltration Test Location

Notes

Produced following Exploratory Trial Pitting Investigation

Figure 2

Drawing Title

Soil Infiltration Test Location Plan

Project Number 21-272.02

Project Title

South Side, Steeple Aston, Bicester OX25 4RY

Drawn by CB

Checked by JB

Scale NTS



APPENDIX II
TRIAL PIT LOGS + PHOTOGRAPHS





TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST1
Client: Rectory Homes		Start: 06/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.2) 0.2									
Brown slightly gravelly CLAY. Gravels are coarse subangular-subrounded limestone. (OOLITE GROUP)		(0.4) 0.6									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.6) 2.2									
Grey with light brown mottling CLAY. (OOLITE GROUP)		2.3									
...trial pit ended at 2.3m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	06/12/2021	-	-	-	-	

Remarks No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.6m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY		By	Date
	Logged	CB	
	Checked	JB	Scale 01:25



TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST2
Client: Rectory Homes		Start: 06/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.2) 0.2									
Brown slightly gravelly CLAY. Gravels are coarse subangular-subrounded limestone. (OOLITE GROUP)		(0.4) 0.6									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.5) 2.1									
Grey with light brown mottling CLAY. (OOLITE GROUP)		(0.2) 2.3									
...trial pit ended at 2.3m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	06/12/2021	-	-	-	-	

Remarks		By	Date
No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.6m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY		Logged	CB
		Checked	JB
		Scale 01:25	



TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST3
Client: Rectory Homes		Start: 06/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.2) 0.2									
Brown slightly gravelly CLAY. Gravels are coarse subangular-subrounded limestone. (OOLITE GROUP)		(0.4) 0.6									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.4) 2.0									
Grey with light brown mottling CLAY. (OOLITE GROUP)		2.1									
...trial pit ended at 2.1m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	06/12/2021	-	-	-	-	
Remarks							By	Date
No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.6m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY							Logged	CB
							Checked	JB



TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST4
Client: Rectory Homes		Start: 06/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.3) 0.3									
Brown slightly gravelly CLAY. Gravels are coarse subangular-subrounded limestone. (OOLITE GROUP)		(0.3) 0.5									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.1) 1.6									
Grey with light brown mottling CLAY. (OOLITE GROUP)		(0.2) 1.8									
...trial pit ended at 1.8m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	06/12/2021	-	-	-	-	

Remarks		By	Date
No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.1m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY		Logged	CB
		Checked	JB
		Scale 01:25	



TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST5
Client: Rectory Homes		Start: 06/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.3) 0.3									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.7) 2.0									
Grey with light brown mottling CLAY. (OOLITE GROUP)		(0.3) 2.3									
...trial pit ended at 2.3m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	06/12/2021	-	-	-	-	

Remarks No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.6m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY		By	Date
	Logged	CB	
	Checked	JB	Scale 01:25



TRIAL PIT LOG

Project: South Side, Steeple Aston, Bicester OX25 4RY		Project No. 21-272.02	Trial Pit: ST6
Client: Rectory Homes		Start: 07/12/2021	End: 07/12/2021
Method/Plant Used: 12T tracked machine	Co-ordinates: NT	Ground Level: NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests							Laboratory Test Details
				Depth	No	Type					
Dark brown sandy gravelly SILT. Sand is fine-coarse. Gravels are fine-medium subrounded-rounded pebbles. (TOPSOIL)		(0.2) 0.2									
Brown slightly gravelly CLAY. Gravels are coarse subangular-subrounded limestone. (OOLITE GROUP)		(0.4) 0.6									
Light brown sandy cobbly GRAVEL. Sand is medium-coarse. Gravels are coarse subangular-subrounded limestone. Cobbles are tabular limestones. (OOLITE GROUP)		(1.4) 2.0									
Grey with light brown mottling CLAY. (OOLITE GROUP)		2.1									
...trial pit ended at 2.1m.											

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
2.00	0.60	2.30	07/12/2021	-	-	-	-	

Remarks No groundwater encountered in trial pit. Trial pit relatively stable. Excavation rate steady. Pit excavated to 1.6m to complete infiltration test. Upon completion of test pit extended to provide depth of underlying CLAY		By	Date
	Logged	CB	
	Checked	JB	Scale 01:25



ST1



ST1 Arisings



ST2



ST2 Arisings



ST3



ST3 Arisings

Soakage Test Photos

Project Number 21-272.02 Project Title South Side, Steeple Aston, Bicester OX25 4RY

Taken by CB Date 06-07/12/2021



ST4



ST4 Arisings



ST5



ST5 Arisings



ST6



ST6 Arisings

APPENDIX III
TEST RESULTS AND INFILTRATION RATES



Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST1 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.68m

Actual Storage Volume: **1.92 m³**
Effective Depth: **0.92 m**

Time (mins)	Depth BGL (m)
0	0.680
2	0.690
3	0.710
4	0.730
12	0.810
23	0.870
34	0.920
45	0.970
55	1.020
90	1.190
140	1.340
156	1.370
156	1.370

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.92m
 V : **1.104 m³**

V_{p75-25} : **0.552 m³**

Effective Internal Surface Area, a_{p50} : 1.84m² + 0.552m² + 1.2m²
 a_{p50} : **3.592 m²**

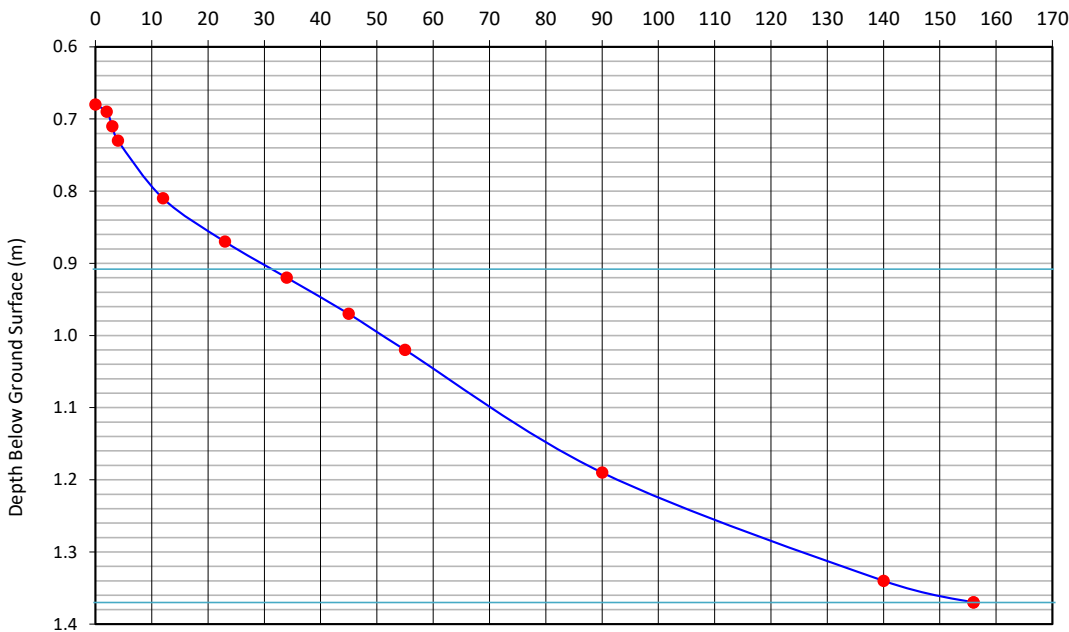
Time of water level fall, t_{p75-25} : **156 - 32 mins**

t_{p75-25} : **124 mins**

t_{p75-25} : **7440 secs**

Soil infiltration rate, f : 0.552/(3.592 x 7440)
 f : **2.07E-05 ms⁻¹**

Water Level vs. Time Time from Filling to Maximum Effective Depth (mins)



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST1 T2

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: **1.92 m³**
Effective Depth: **0.91 m**

Time (mins)	Depth BGL (m)
0	0.690
2	0.710
4	0.730
8	0.760
18	0.800
66	0.970
105	1.110
163	1.220
220	1.300
282	1.370
282	1.370

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.91m
 V : **1.092 m³**

V_{p75-25} : **0.546 m³**

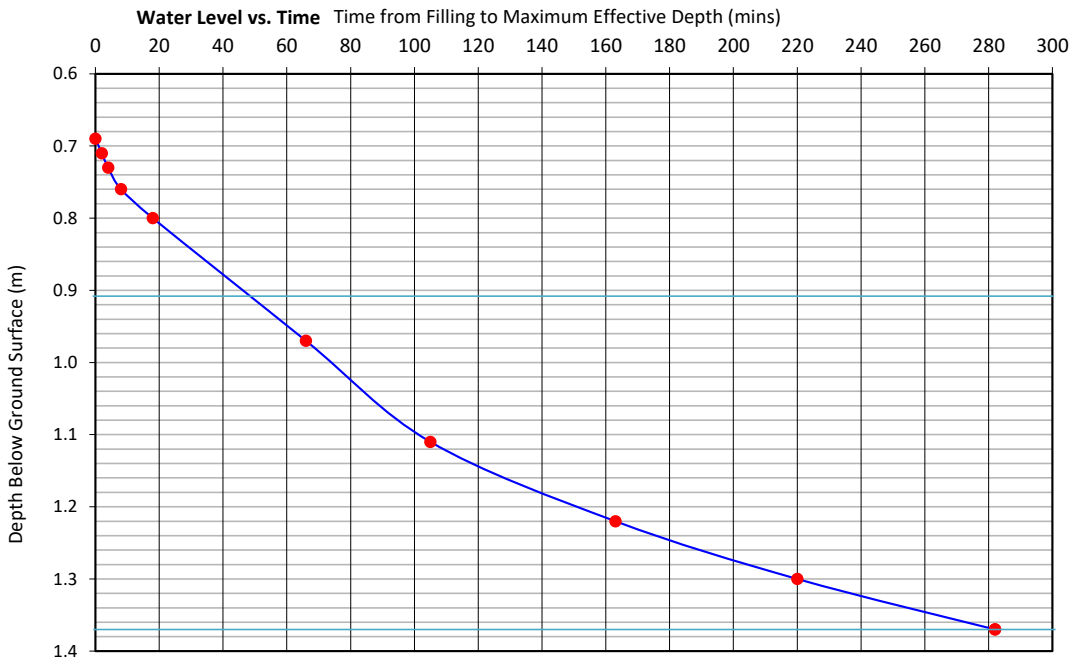
Effective Internal Surface Area, a_{p50} : 1.82m² + 0.546m² + 1.2m²
 a_{p50} : **3.566 m²**

Time of water level fall, t_{p75-25} : **282 - 48 mins**

t_{p75-25} : **234 mins**

t_{p75-25} : **14040 secs**

Soil infiltration rate, f : 0.546/(3.566 x 14040)
 f : **1.09E-05 ms⁻¹**



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation

Fall over test mins = m

Theoretical t_{75} = min

Theoretical t_{25} = min

Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t_{75} and t_{25}

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST1 T3

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
 Start Water Level: 0.69m

Actual Storage Volume: **1.92 m³**
 Effective Depth: **0.91 m**

Time (mins)	Depth BGL (m)
0	0.690
2	0.710
4	0.720
10	0.780
51	0.940
120	1.130
182	1.220
242	1.290
333	1.380

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

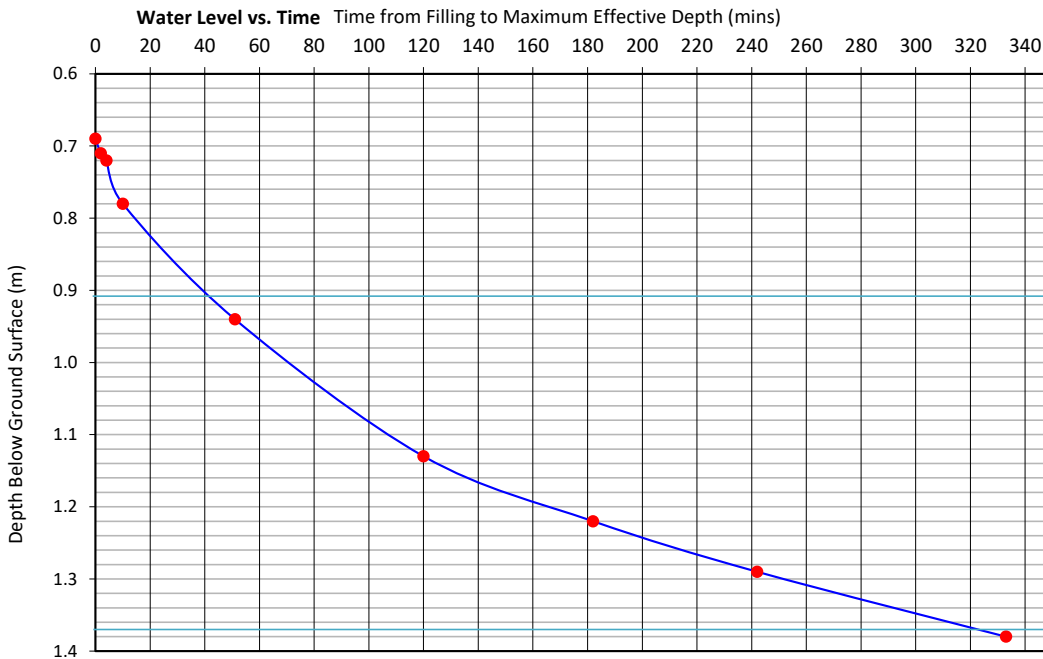
Effective Storage Volume, V : 2m x 0.6m x 0.91m
 V : **1.092 m³**

V_{p75-25} : **0.546 m³**

Effective Internal Surface Area, a_{p50} : 1.82m² + 0.546m² + 1.2m²
 a_{p50} : **3.566 m²**

Time of water level fall, t_{p75-25} : **325 - 45 mins**
 t_{p75-25} : **280 mins**
 t_{p75-25} : **16800 secs**

Soil infiltration rate, f : 0.546/(3.566 x 16800)
 f : **9.11E-06 ms⁻¹**



— Line of best fit
 — t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit SP2 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
 Start Water Level: 0.69m

Actual Storage Volume: **1.92 m³**
 Effective Depth: **0.91 m**

Time (mins)	Depth BGL (m)
0	0.690
2	0.710
7	0.730
13	0.760
27	0.840
40	0.880
107	1.050
138	1.110
197	1.290
231	1.380

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

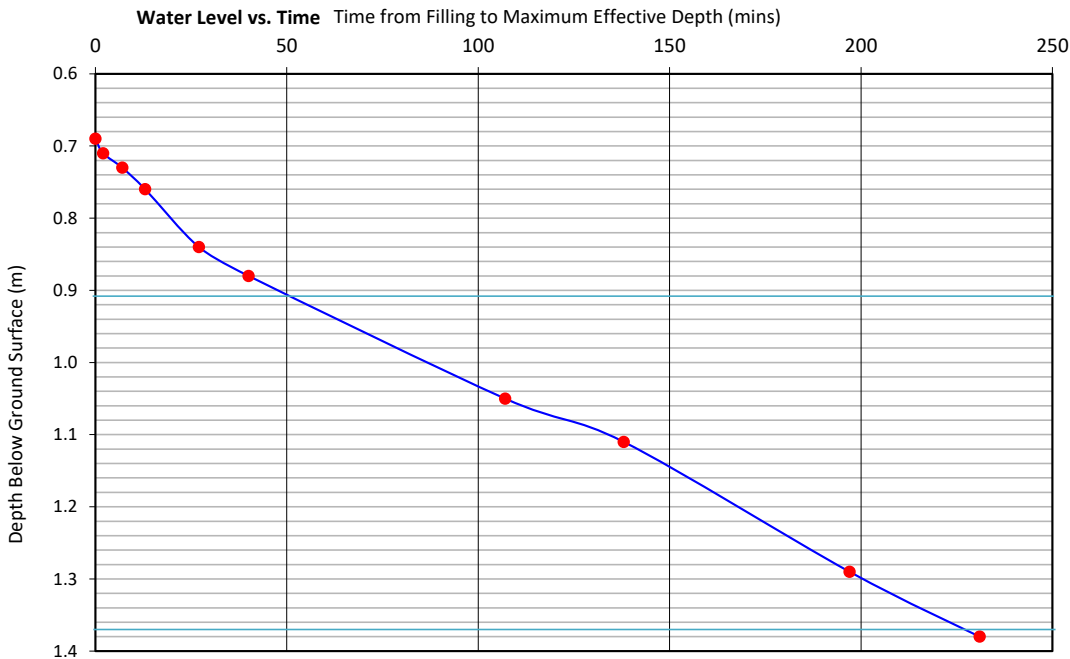
Effective Storage Volume, V : 2m x 0.6m x 0.91m
 V : **1.092 m³**

V_{p75-25} : **0.546 m³**

Effective Internal Surface Area, a_{p50} : 1.82m² + 0.546m² + 1.2m²
 a_{p50} : **3.566 m²**

Time of water level fall, t_{p75-25} : **225 - 50 mins**
 t_{p75-25} : **175 mins**
 t_{p75-25} : **10500 secs**

Soil infiltration rate, f : 0.546/(3.566 x 10500)
 f : **1.46E-05 ms⁻¹**



— Line of best fit
 — t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST2 T2

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
 Start Water Level: 0.7m

Actual Storage Volume: **1.92 m³**
 Effective Depth: **0.90 m**

Time (mins)	Depth BGL (m)
0	0.700
1010	1.600

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.9m
 V : **1.08 m³**

V_{p75-25} : **0.540 m³**

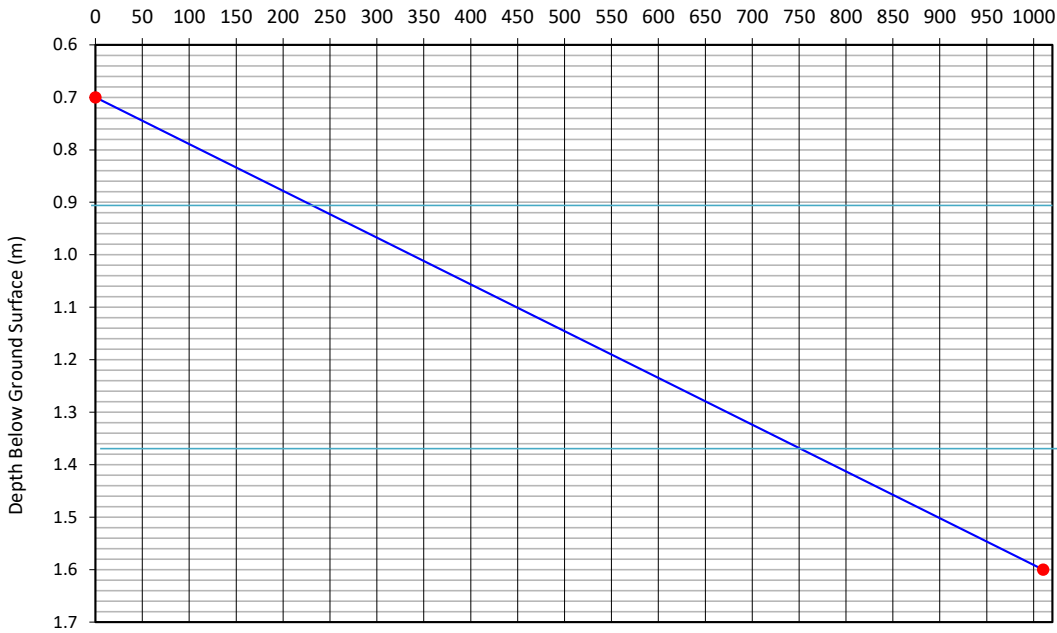
Effective Internal Surface Area, a_{p50} : 1.8m² + 0.54m² + 1.2m²
 a_{p50} : **3.540 m²**

Time of water level fall, t_{p75-25} : **750 - 230 mins**
 t_{p75-25} : **520 mins**
 t_{p75-25} : **31200 secs**

Soil infiltration rate, f : 0.54/(3.54 x 31200)
 f : **4.89E-06 ms⁻¹**

Allowed to fully drain over-night to complete a 2nd fill/drain

Water Level vs. Time Time from Filling to Maximum Effective Depth (mins)



— Line of best fit
 — t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST2 T3

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.7m

Actual Storage Volume: 1.92 m³
Effective Depth: 0.90 m

Time (mins)	Depth BGL (m)
0	0.690
2	0.710
4	0.720
9	0.730
19	0.790
36	0.830
48	0.880
97	0.970
162	1.070
223	1.120
282	1.180
345	1.250
400	1.310
478	1.390

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.9m
 V : 1.08 m³

V_{p75-25} : 0.540 m³

Effective Internal Surface Area, a_{p50} : 1.8m² + 0.54m² + 1.2m²
 a_{p50} : 3.540 m²

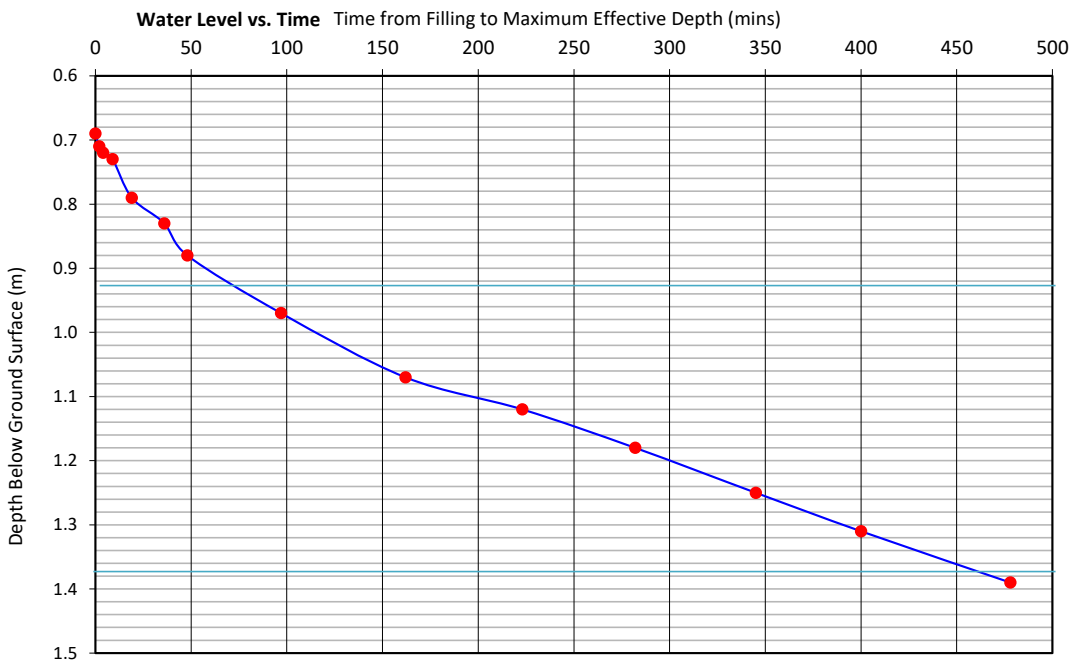
Time of water level fall, t_{p75-25} : 465 - 78 mins

t_{p75-25} : 387 mins

t_{p75-25} : 23220 secs

Soil infiltration rate, f : 0.54/(3.54 x 23220)

f : 6.57E-06 ms⁻¹



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST3 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: **1.92 m³**
Effective Depth: **0.91 m**

Time (mins)	Depth BGL (m)
0	0.690
2	0.750
6	0.820
25	1.130
50	1.480

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.91m
 V : **1.092 m³**

V_{p75-25} : **0.546 m³**

Effective Internal Surface Area, a_{p50} : 1.82m² + 0.546m² + 1.2m²
 a_{p50} : **3.566 m²**

Time of water level fall, t_{p75-25} : **43 - 12 mins**
 t_{p75-25} : **31 mins**
 t_{p75-25} : **1860 secs**

Soil infiltration rate, f : 0.546/(3.566 x 1860)
 f : **8.23E-05 ms⁻¹**



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST3 T2

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.68m

Actual Storage Volume: **1.92 m³**
Effective Depth: **0.92 m**

Time (mins)	Depth BGL (m)
0	0.680
2	0.710
4	0.740
10	0.800
50	1.160
65	1.300
74	1.370

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

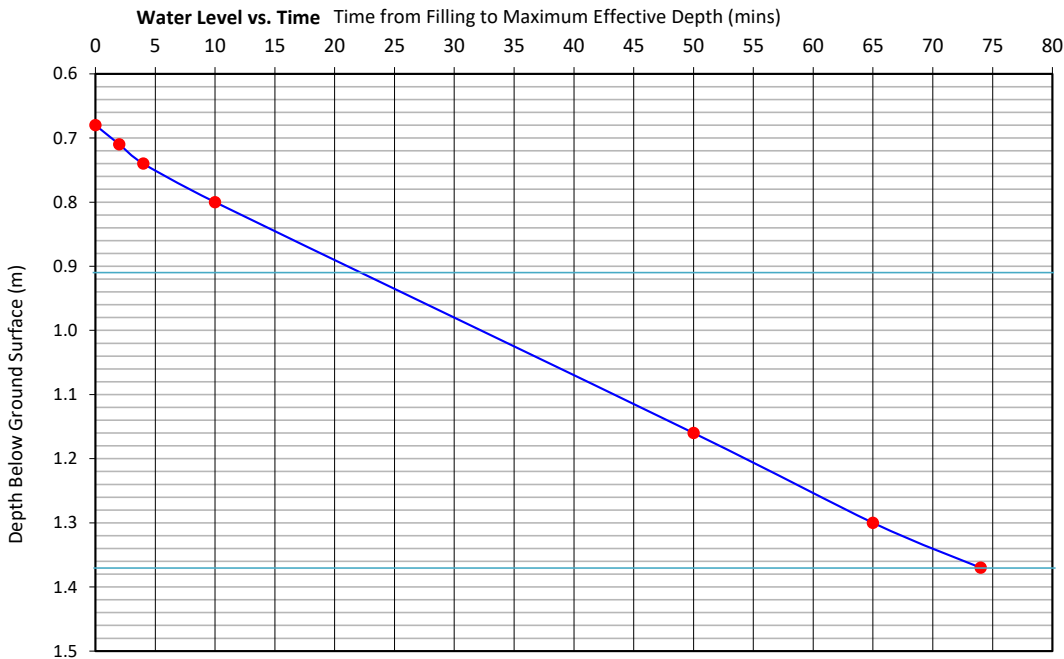
Effective Storage Volume, V : 2m x 0.6m x 0.92m
 V : **1.104 m³**

V_{p75-25} : **0.552 m³**

Effective Internal Surface Area, a_{p50} : 1.84m² + 0.552m² + 1.2m²
 a_{p50} : **3.592 m²**

Time of water level fall, t_{p75-25} : **74 - 22 mins**
 t_{p75-25} : **52 mins**
 t_{p75-25} : **3120 secs**

Soil infiltration rate, f : 0.552/(3.592 x 3120)
 f : **4.93E-05 ms⁻¹**



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST3 T3

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
 Start Water Level: 0.68m

Actual Storage Volume: **1.92 m³**
 Effective Depth: **0.92 m**

Time (mins)	Depth BGL (m)
0	0.680
2	0.700
4	0.730
10	0.800
20	0.900
33	1.000
67	1.210
78	1.270
90	1.330
103	1.380

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V: 2m x 0.6m x 0.92m
 V: **1.104 m³**

V_{p75-25} : **0.552 m³**

Effective Internal Surface Area, a_{p50} : 1.84m² + 0.552m² + 1.2m²
 a_{p50} : **3.592 m²**

Time of water level fall, t_{p75-25} : **101 - 21 mins**
 t_{p75-25} : **80 mins**
 t_{p75-25} : **4800 secs**

Soil infiltration rate, f : 0.552 / (3.592 x 4800)
 f : **3.20E-05 ms⁻¹**



— Line of best fit
 — t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST4 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.1m(d)
Start Water Level: 0.59m

Actual Storage Volume: **1.32 m³**
Effective Depth: **0.51 m**

Time (mins)	Depth BGL (m)
0	0.590
1	0.590
2	0.590
3	0.590
4	0.600
12	0.600
60	0.650
113	0.720
162	0.730
208	0.760
1225	1.090

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.51m
 V : **0.612 m³**

V_{p75-25} : **0.306 m³**

Effective Internal Surface Area, a_{p50} : 1.02m² + 0.306m² + 1.2m²
 a_{p50} : **2.526 m²**

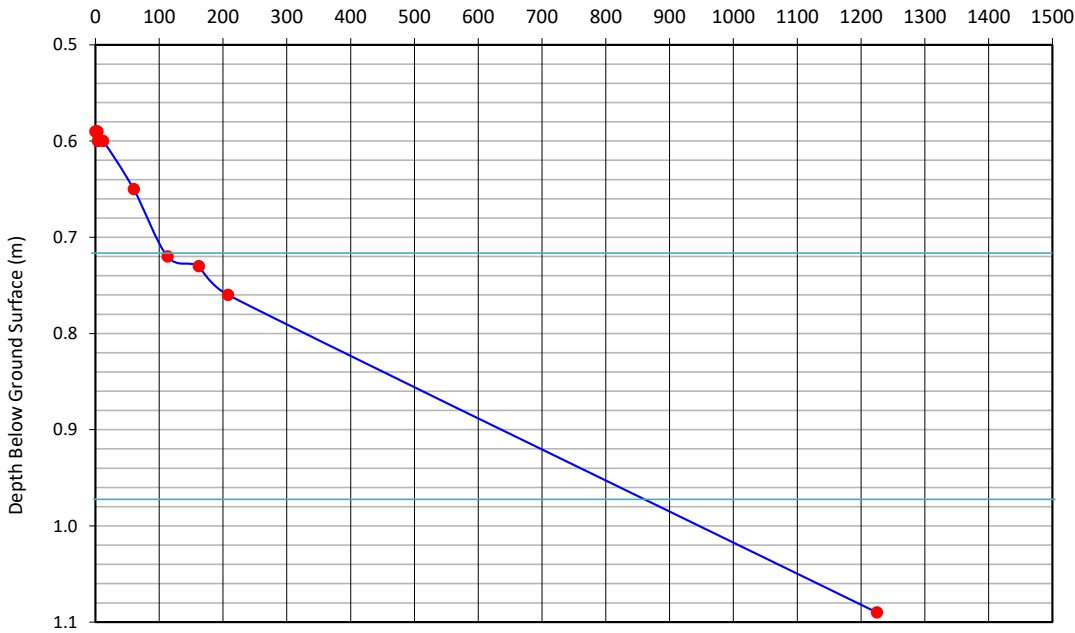
Time of water level fall, t_{p75-25} : **870 - 110 mins**

t_{p75-25} : **760 mins**

t_{p75-25} : **45600 secs**

Soil infiltration rate, f : 0.306/(2.526 x 45600)
 f : **2.66E-06 ms⁻¹**

Water Level vs. Time Time from Filling to Maximum Effective Depth (mins)



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation

Fall over test mins = m

Theoretical t_{75} = min

Theoretical t_{25} = min

Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t_{75} and t_{25}

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST4 T2

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.1m(d)
Start Water Level: 0.59m

Actual Storage Volume: **1.32 m³**
Effective Depth: **0.51 m**

Time (mins)	Depth BGL (m)
0	0.590
1	0.590
26	0.610
80	0.650
131	0.680
198	0.720
260	0.740
320	0.750

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

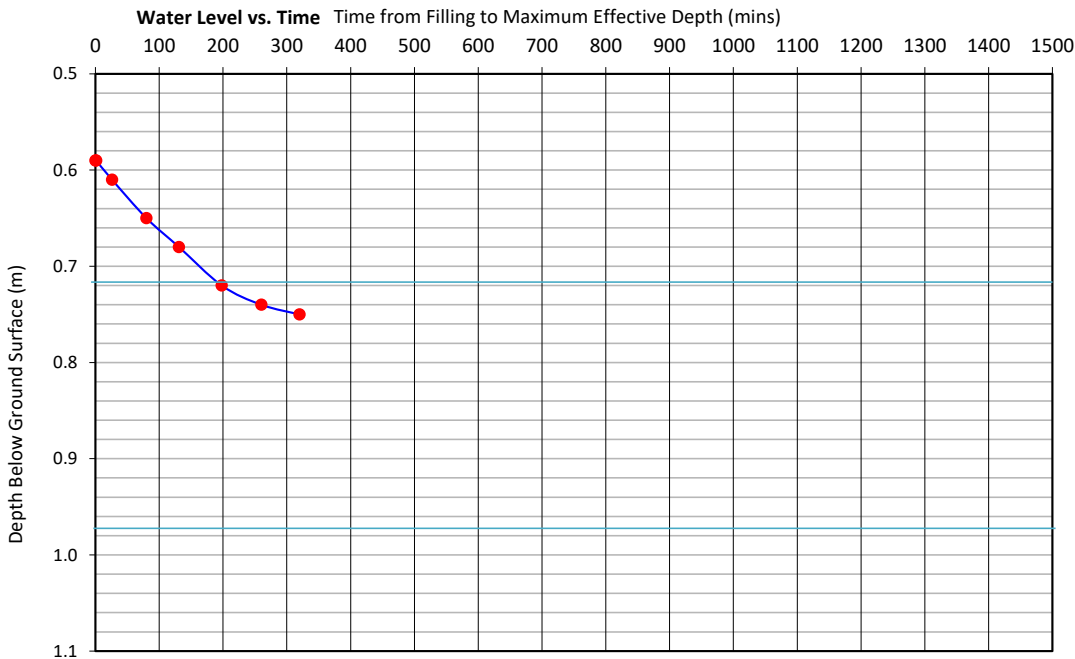
Effective Storage Volume, V : **2m x 0.6m x 0.51m**
 V : **0.612 m³**

V_{p75-25} : **0.306 m³**

Effective Internal Surface Area, a_{p50} : **1.02m² + 0.306m² + 1.2m²**
 a_{p50} : **2.526 m²**

Time of water level fall, t_{p75-25} : **810 - 195 mins**
 t_{p75-25} : **615 mins**
 t_{p75-25} : **36900 secs**

Soil infiltration rate, f : **0.306 / (2.526 x 36900)**
 f : **3.28E-06 ms⁻¹**



— Line of best fit
— t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST5 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: 1.92 m³
Effective Depth: 0.91 m

Time (mins)	Depth BGL (m)
0	0.690
23	0.800
51	0.870
100	0.970
151	1.010
199	1.050
301	1.120
384	1.170

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V: 2m x 0.6m x 0.91m
V: 1.092 m³

V_{p75-25}: 0.546 m³

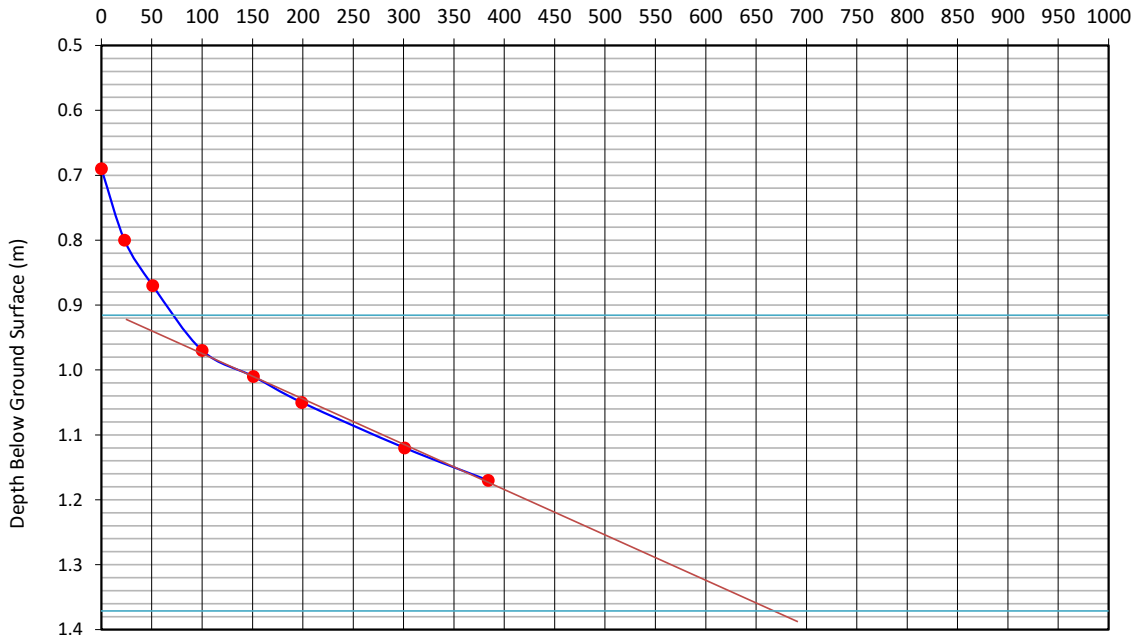
Effective Internal Surface Area, a_{p50}: 1.82m² + 0.546m² + 1.2m²
a_{p50}: 3.566 m²

Time of water level fall, t_{p75-25}: 675 - 75 mins
t_{p75-25}: 600 mins
t_{p75-25}: 36000 secs

Soil infiltration rate, f : 0.546/(3.566 x 36000)
f : 4.25E-06 ms⁻¹

Test result extrapolated

Water Level vs. Time Time from Filling to Maximum Effective Depth (mins)



Line of best fit
t₇₅ & t₂₅

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t ₇₅ and t ₂₅
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST5 T2

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: 1.92 m³
Effective Depth: 0.91 m

Time (mins)	Depth BGL (m)
0	0.690
1020	1.460

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V : 2m x 0.6m x 0.91m
 V : 1.092 m³

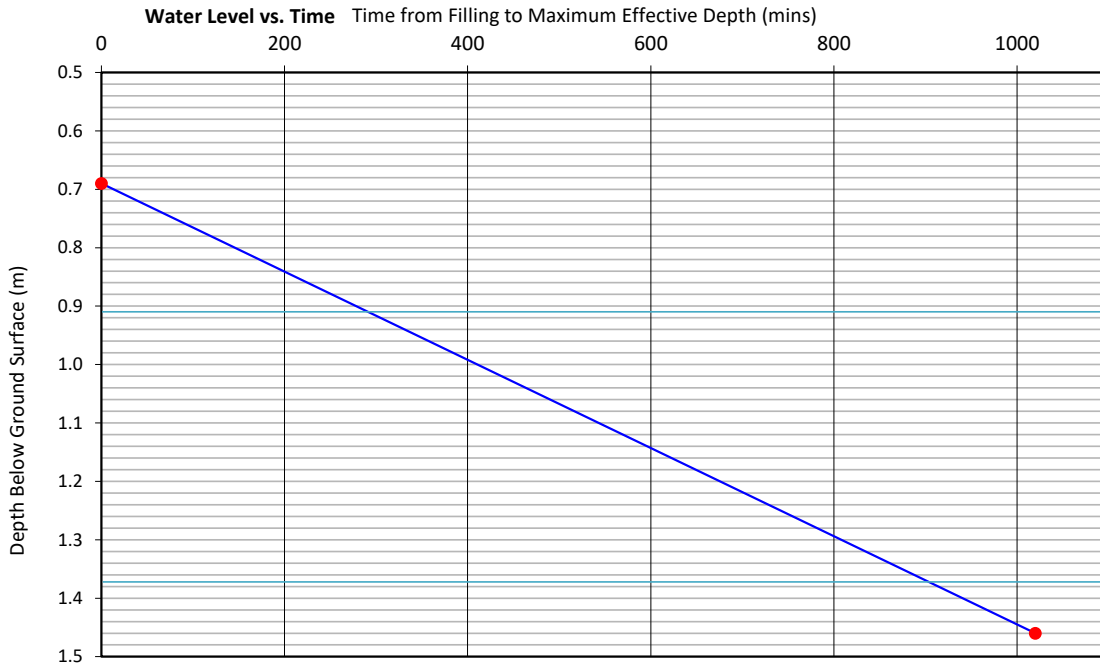
V_{p75-25} : 0.546 m³

Effective Internal Surface Area, a_{p50} : 1.82m² + 0.546m² + 1.2m²
 a_{p50} : 3.566 m²

Time of water level fall, t_{p75-25} : 905 - 290 mins
 t_{p75-25} : 615 mins
 t_{p75-25} : 36900 secs

Soil infiltration rate, f : 0.546/(3.566 x 36900)
 f : 4.15E-06 ms⁻¹

Allowed to fully drain over-night to complete a 2nd fill/drain



Line of best fit
t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST5 T3

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: 1.92 m³
Effective Depth: 0.91 m

Time (mins)	Depth BGL (m)
0	0.690
1	0.690
3	0.690
6	0.700
13	0.720
36	0.780
91	0.870
141	0.920
208	0.980
270	1.030
330	1.060

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Effective Storage Volume, V: 2m x 0.6m x 0.91m
V: 1.092 m³

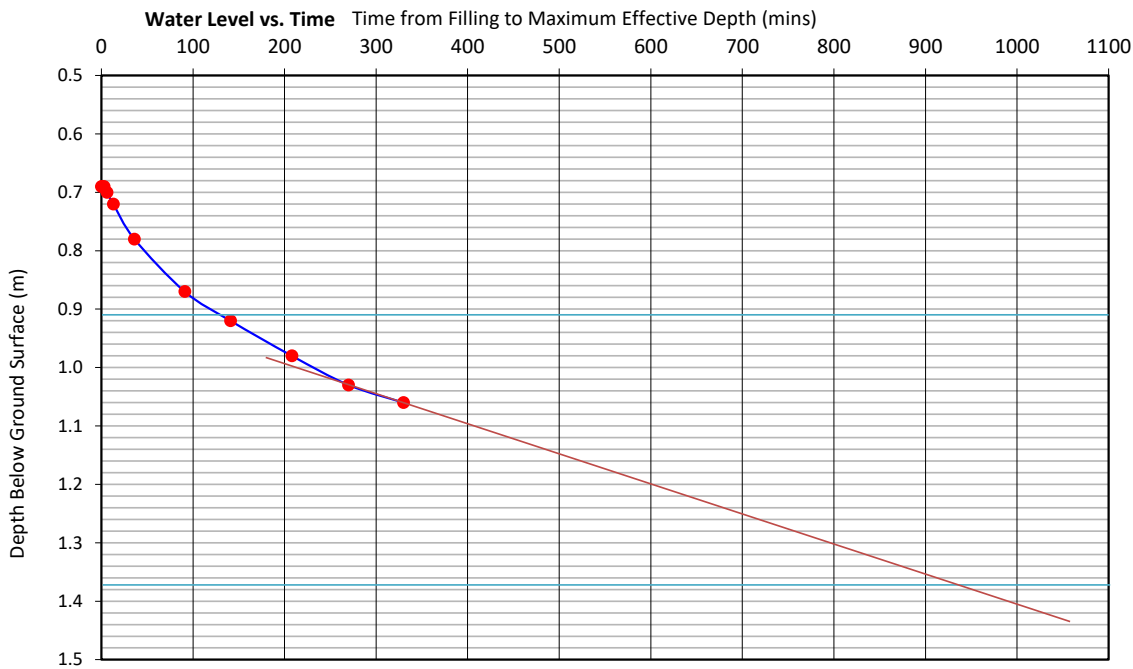
V_{p75-25}: 0.546 m³

Effective Internal Surface Area, a_{p50}: 1.82m² + 0.546m² + 1.2m²
a_{p50}: 3.566 m²

Time of water level fall, t_{p75-25}: 950 - 130 mins
t_{p75-25}: 820 mins
t_{p75-25}: 49200 secs

Soil infiltration rate, f : 0.546/(3.566 x 49200)
f : 3.11E-06 ms⁻¹

Test result extrapolated



Line of best fit
t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	

Soil Infiltration Test

21-272.02: South Side, Steeple Aston, Bicester OX25 4RY



Test Pit ST6 T1

Readings Recorded By: C. Bartlett

Pit Dimensions: 2m(l) x 0.6m(w) x 1.6m(d)
Start Water Level: 0.69m

Actual Storage Volume: **1.92 m³**
Effective Depth: **0.91 m**

Time (mins)	Depth BGL (m)
0	0.690
2	0.700
7	0.740
69	1.110
129	1.260
189	1.350
215	1.390

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

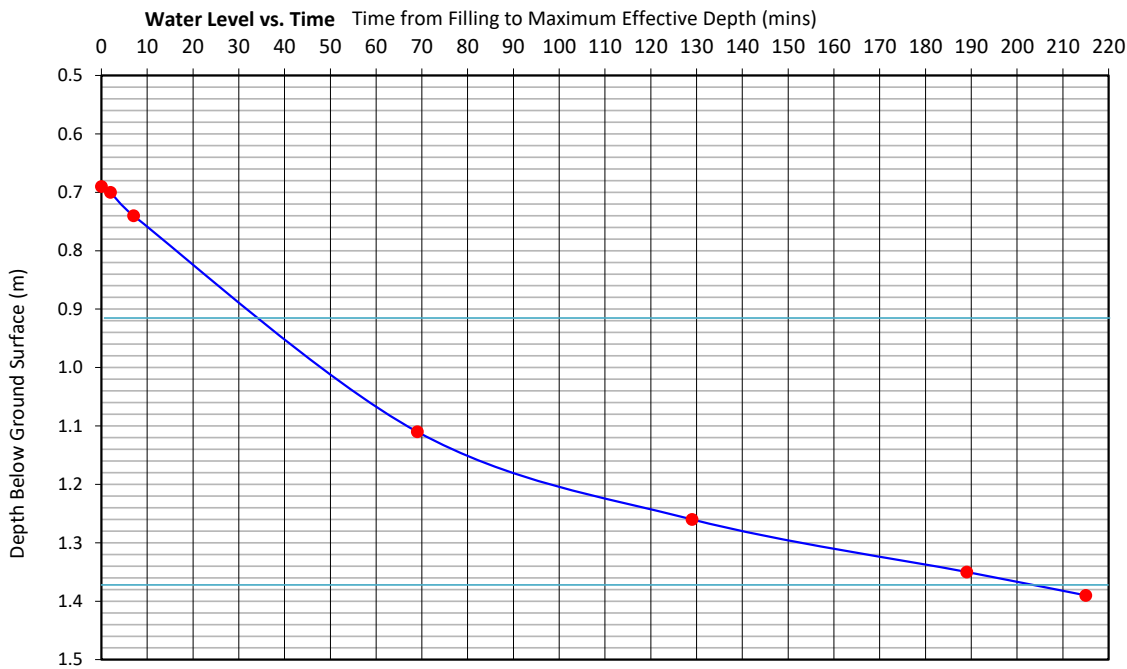
Effective Storage Volume, V : **2m x 0.6m x 0.91m**
 V : **1.092 m³**

V_{p75-25} : **0.546 m³**

Effective Internal Surface Area, a_{p50} : **1.82m² + 0.546m² + 1.2m²**
 a_{p50} : **3.566 m²**

Time of water level fall, t_{p75-25} : **205 - 34 mins**
 t_{p75-25} : **171 mins**
 t_{p75-25} : **10260 secs**

Soil infiltration rate, f : **0.546/(3.566 x 10260)**
 f : **1.49E-05 ms⁻¹**



Line of best fit
t75 & t25

ONLY USE EXTRAPOLATION WHEN GRAPHICAL DATA IS INSUFFICIENT

Extrapolation		Where fall in water level during infiltration tests does not meet the 75% and 25% full level these have been extrapolated from the data set in order to complete the calculation and provide a theoretical infiltration rate in the absence of additional data. This theoretical infiltration rate is based upon infiltration observed within the duration of the test to assume a t75 and t25
Fall over test mins =	m	
Theoretical t ₇₅ =	min	
Theoretical t ₂₅ =	min	