

- Infrastructure Design
- Structural Engineering

- Planning Services
- Professional Advice

- Geotechnical & Environmental Surveying



Our Ref: 24934/MC/AP/L01

Your Ref:

Date: 31<sup>st</sup> August 2022

**JPP Geotechnical & Environmental Ltd**  
4 Ironstone Way | Brixworth  
Northampton | NN6 9UD

T: 01604 781811  
E: northampton@jppuk.net  
W: jppuk.net

**Mercian Group**

Unit 4  
The Triangle  
Wildwood Drive  
Worcester  
WR5 2QX

Dear Mr Brittain,

**Re: Infiltration Testing for proposed drainage solution on the land off Longford Park Road, Bodicote Banbury**

**Introduction**

The following provides a summary of infiltration testing carried out on the 18<sup>th</sup> August 2022. Our investigation was limited to infiltration testing to inform stormwater drainage solutions for the proposed development at land off Longford Park Road, Bodicote, Banbury.

This letter report has been produced for the sole benefit of our client, Mercian Group. JPP do not accept any liability for the third-party use of the information herein without prior reliance agreed. This report is valid for 6 years from the date of issue.

Investigations have been carried out using reasonable care and judgement based on the scope. There is a potential for ground conditions to vary from those encountered during our investigations and differ where not exposed by our investigations.

The scope of this letter covers infiltration testing only to inform drainage options for the proposed development.

**Site description**

The site is located to the west of Longford Park Road, Bodicote, Banbury and is centred at an approximate grid reference of 446695, 238194. The site is a rectangular grassed paddock with a row of mature trees in the south of the site with boundary hedgerows and vegetation. It is proposed to construct a care home development with associated infrastructure and access.

The site is relatively flat and slopes gently from approximately 120.5m Above Ordnance Datum (m AOD) in the northeast of the down to approximately 119.75mAOD in the south.

JPP Geotechnical and Environmental Ltd Registered in England 11117245

**Registered office**

<b>NORTHAMPTON</b>	<b>WARWICK</b>	<b>MILTON KEYNES</b>	<b>POOLE</b>
4 Ironstone Way Brixworth Northampton NN6 9UD	Unit 12a Warwick Innovation Centre Warwick Technology Park Gallows Hill   Warwick   CV34 6UW	B2A Denbigh Business Park 23 First Avenue Milton Keynes   MK1 1DN	Suite 8 Branksome Park Branksome Business Park Bourne Valley Road   Poole Dorset   BH12 1ED
T: 01604 781811	T: 02476 100530	T: 01908 889433	T: 01202 540888

## **Fieldwork**

Four trial pits were excavated across the site using a 3 tonne excavator with subsequent infiltration testing carried out within each trial pit. The bedrock deposits prevent significant depth being excavated with the excavator, a maximum penetration of between 1.10m and 1.50m below ground level (m bgl) was achieved.

The infiltration testing was carried out on the 18<sup>th</sup> August 2022 in general accordance with BRE 365 ‘Soakaway Design’ guidance.

Statutory undertaker’s service records were obtained prior to works commencing and were referred to during the site investigation in order to avoid any buried services that may cross the site. Each position was scanned using a cable avoidance tool with the use of a signal generator prior to positioning and proceeding.

The approximate trial pit positions are shown on the topographical survey and proposed site plan (Drawings 01 and 02). Trial pit logs and infiltration test records are also enclosed.

## **Geology and ground conditions encountered**

According to the British Geological Survey (BGS) mapping, there are no superficial deposits on the site. The bedrock geology is of the Whitby Mudstone Formation overlying the Marlstone Rock Formation.

Topsoil was encountered in all trial pits up to a maximum depth of 0.30m below ground level (m bgl) generally comprising a brown, slightly gravelly, slightly sandy clayey topsoil with rootlets and gravels of fine to medium subangular to subrounded ironstone and sandstone with brick fragments found in TP01 and TP02.

The Marlstone Rock Formation was present underlying the topsoil up to a maximum excavated depth of 1.50m bgl and was generally firm to stiff, orange/brown, gravelly, slightly sandy clay with occasional cobbles and gravels consisting of fine to coarse subangular to subrounded ironstone and sandstone.

No groundwater was encountered during the investigation.

## **Infiltration testing**

Infiltration testing was carried out in general accordance with BRE 365 ‘Soakaway Design’, with the results summarised in Table 1. The test records are also enclosed with this letter.

<b>Trial pit position</b>	<b>Cycle</b>	<b>Base depth of trial pit</b>	<b>Testing result</b>
TP01	1	1.10m bgl	Insufficient infiltration to derive a permeability rate.
TP02	1	1.30m bgl	Insufficient infiltration to derive a permeability rate.
TP03	1	1.45m bgl	Insufficient infiltration to derive a permeability rate.
TP04	1	1.50m bgl	Insufficient infiltration to derive a permeability rate.

**Table 1**

Infiltration testing was carried out in the four trial pit positions across the site up to a maximum depth of 1.50m depth bgl. Due to the cohesive soils encountered there was insufficient infiltration to derive an infiltration rate with no reduction in water levels recorded during the testing. Therefore, the soils can be considered as impermeable.

***Assessment and Summary***

The infiltration testing we have carried out has indicated that the soils underlying the entire site are not suitable for soakaways proposed on site.

We therefore consider soakaways as unviable for the site surface drainage and an alternative method of drainage should be considered.

Yours sincerely,



**Mitch Coldwell BSc (Hons)**  
Graduate Geo-Environmental Engineer



**Anthony Paton BSc (Hons) MSc FGS**  
Associate



**Enclosed**

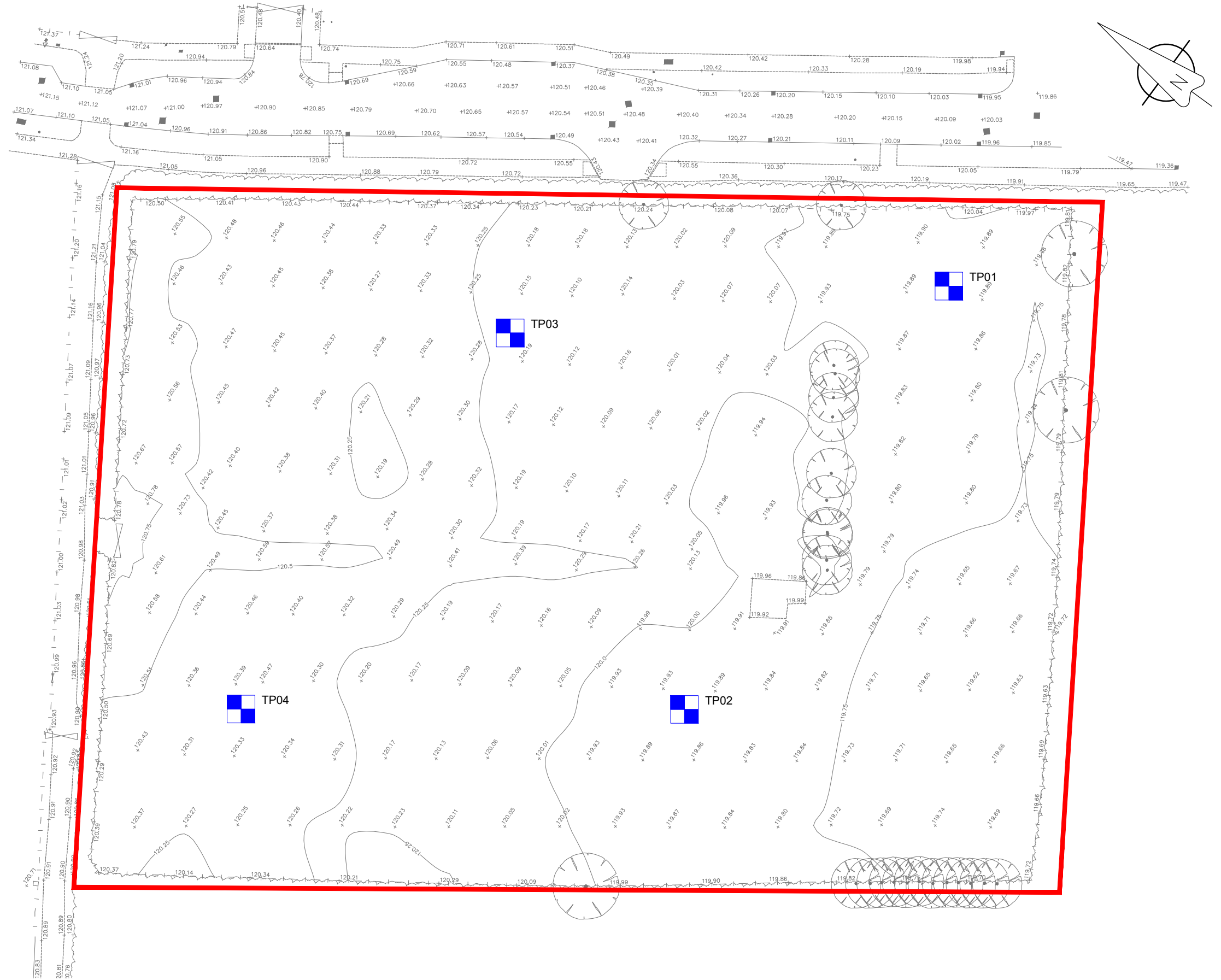
Investigation position plans  
Trial pit records  
Photographic records of trial pits  
Soakaway test records

Base drawing:

Topographical Survey produced by JPP Surveying,  
drawing number: 25354Y, dated 04/08/22

KEY

-  TP Machine excavated trial pit with infiltration testing
-  Site Boundary



Northampton  
T: 01604 781811

Warwick  
T: 02476 100530

Milton Keynes  
T: 01908 889433

E: [mail@jppuk.net](mailto:mail@jppuk.net)  
W: [jppuk.net](http://jppuk.net)

- Infrastructure Design
- Geotechnical & Environmental
- Structural Engineering
- Surveying
- Planning Services
- Professional Advice

Drawn By:	DM
Chkd By:	LC
Scale @A3:	500:1
Date:	August 2022
Status:	FOR INFORMATION
Project No.:	24934



Client	Mrecian Developments
Project	Bodicote, Banbury
Title	Investigation Positions over Topographical Survey
Drawing No:	01
Rev:	0

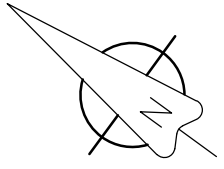


Base drawing:

Proposed Site Layout produced by KWL Architects,  
drawing number: SK01 REV H, dated 23.08.2021

KEY

-  TP Machine excavated trial pit with infiltration testing
-  Site Boundary



Schedule	
Site Area	9703.2m <sup>2</sup> / 2.3
Ground Floor	2120m <sup>2</sup>
First Floor	3013m <sup>2</sup>
Second Floor	4569m <sup>2</sup>
Total	9699m <sup>2</sup>
Bedrooms	
Ground Floor	64 Bedrooms
First Floor	64 Bedrooms
Second Floor	74 Bedrooms
Total	202 Bedrooms
Trees	
Existing Trees	10 to be retained
Existing Trees	10 to be removed
Proposed Trees	10

- Northampton  
T: 01604 781811
- Warwick  
T: 02476 100530
- Milton Keynes  
T: 01908 889433

E: mail@jppuk.net  
W: jppuk.net

- Infrastructure Design
- Geotechnical & Environmental
- Structural Engineering
- Surveying
- Planning Services
- Professional Advice

Drawn By:	DM
Chkd By:	LC
Scale @A3:	500:1
Date:	August 2022
Status:	FOR INFORMATION
Project No.:	24934

<b>Client</b>	Mrecian Developments
<b>Project</b>	Bodicote, Banbury
<b>Title</b>	Investigation Positions over Proposed Layout
Drawing No:	02
Rev:	0



## Photographic Records – Trial Pits

Project: Bodicote, Banbury

Project Ref: 24934

Date: 18/08/2022

Revision: 0



T: 01604 781811

E: mail@jppuk.net

W: www.jppuk.net

TP01 Ground level to 1.10m bg



L

## Photographic Records – Trial Pits

Project: Bodicote, Banbury

Project Ref: 24934

Date: 18/08/2022

Revision: 0



T: 01604 781811

E: [mail@jppuk.net](mailto:mail@jppuk.net)

W: [www.jppuk.net](http://www.jppuk.net)

TP02 Ground Level to 1.2m bgl during Infiltration Test



## Photographic Records – Trial Pits

Project: Bodicote, Banbury

Project Ref: 24934

Date: 18/08/2022

Revision: 0



T: 01604 781811

E: [mail@jppuk.net](mailto:mail@jppuk.net)

W: [www.jppuk.net](http://www.jppuk.net)

TP03 Ground Level to 1.45m bgl





## Photographic Records – Trial Pits

Project: Bodicote, Banbury

Project Ref: 24934

Date: 18/08/2022

Revision: 0



T: 01604 781811

E: [mail@jppuk.net](mailto:mail@jppuk.net)

W: [www.jppuk.net](http://www.jppuk.net)

TP04 Ground Level to 1.5m bgl





# Trial Pit Log

Project Name: Proposed Care Home Development		Client: The Mercian Group		Date: 18/08/2022	
Location: Bodicote, Banbury		Contractor: Maddock Geotechnical Support			
Project No. : 24934		Crew Name:		Equipment: 3T Excavator	
Location Number TP01	Location Type TP	Level	Logged By MC	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25		Brown slightly sandy slightly gravelly clayey TOPSOIL with rootlets. Gravel consists of fine to medium subangular to subrounded rare brick gravels, glass, sandstone and flint.	
								Firm to stiff dark brown orange slightly sandy slightly gravelly CLAY. Gravel consists of fine to medium subangular to subrounded sandstone and ironstone. (MARLSTONE ROCK FORMATION)
					1.10		End of Trial Pit at 1.100m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.30	0.50						

**Remarks**  
No groundwater encountered. Trial pit refused due to rock present.



# Trial Pit Log

Project Name: Proposed Care Home Development		Client: The Mercian Group		Date: 18/08/2022	
Location: Bodicote, Banbury		Contractor: Maddock Geotechnical Support			
Project No. : 24934		Crew Name:		Equipment: 3T Excavator	
Location Number TP02	Location Type TP	Level	Logged By MC	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			Dark brown black slightly sandy slightly gravelly clayey TOPSOIL with rootlets. Gravel consists of fine to coarse subangular to subrounded sandstone and ironstone.
					1.30		Stiff dark orange brown slightly sandy slightly gravelly CLAY. Gravel consists of fine to coarse subangular to subrounded sandstone and ironstone. (MARLSTONE ROCK FORMATION)	
								End of Trial Pit at 1.300m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.30	0.50						

**Remarks**  
No groundwater encountered. Trial pit refused due to rock present.



# Trial Pit Log

Project Name: Proposed Care Home Development		Client: The Mercian Group		Date: 18/08/2022	
Location: Bodicote, Banbury		Contractor: Maddock Geotechnical Support			
Project No. : 24934		Crew Name:		Equipment: 3T Excavator	
Location Number TP03	Location Type TP	Level	Logged By MC	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
[Pattern]					0.30		[Pattern]	Dark orangey brown slightly sandy slightly gravelly clayey TOPSOIL with rootlets. Gravel consists of fine to coarse subangular to subrounded brick, sandstone and ironstone.
					1.45	[Pattern]	Firm to stiff dark brown orange slightly sandy very gravelly CLAY with occasional cobbles up to 5%. Gravel and cobbles consists of fine to medium subangular to subrounded sandstone and ironstone. (MARLSTONE ROCK FORMATION)	
							End of Trial Pit at 1.450m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.40	0.50						

**Remarks**  
No groundwater encountered. Trial pit refused due to rock present.



# Trial Pit Log

Project Name: Proposed Care Home Development		Client: The Mercian Group		Date: 18/08/2022	
Location: Bodicote, Banbury		Contractor: Maddock Geotechnical Support			
Project No. : 24934		Crew Name:		Equipment: 3T Excavator	
Location Number TP04	Location Type TP	Level	Logged By	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			Dark orange brown sandy slightly gravelly clayey TOPSOIL with rootlets. Gravel consists of fine to medium subangular to subrounded ironstone and sandstone.
								Firm to stiff dark orange brown slightly sandy very gravelly CLAY with some cobbles up to 20%. Gravel and cobbles consists of fine to medium subangular to subrounded ironstone. (MARLSTONE ROCK FORMATION)
					1.50			End of Trial Pit at 1.500m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.30	0.50						

**Remarks**  
No groundwater encountered. Trial pit refused due to rock present.

## Soakaway Test TP02 Cycle 1

Project: Bodicote, Banbury

Project Ref: 24934

Date: 19 August 2022

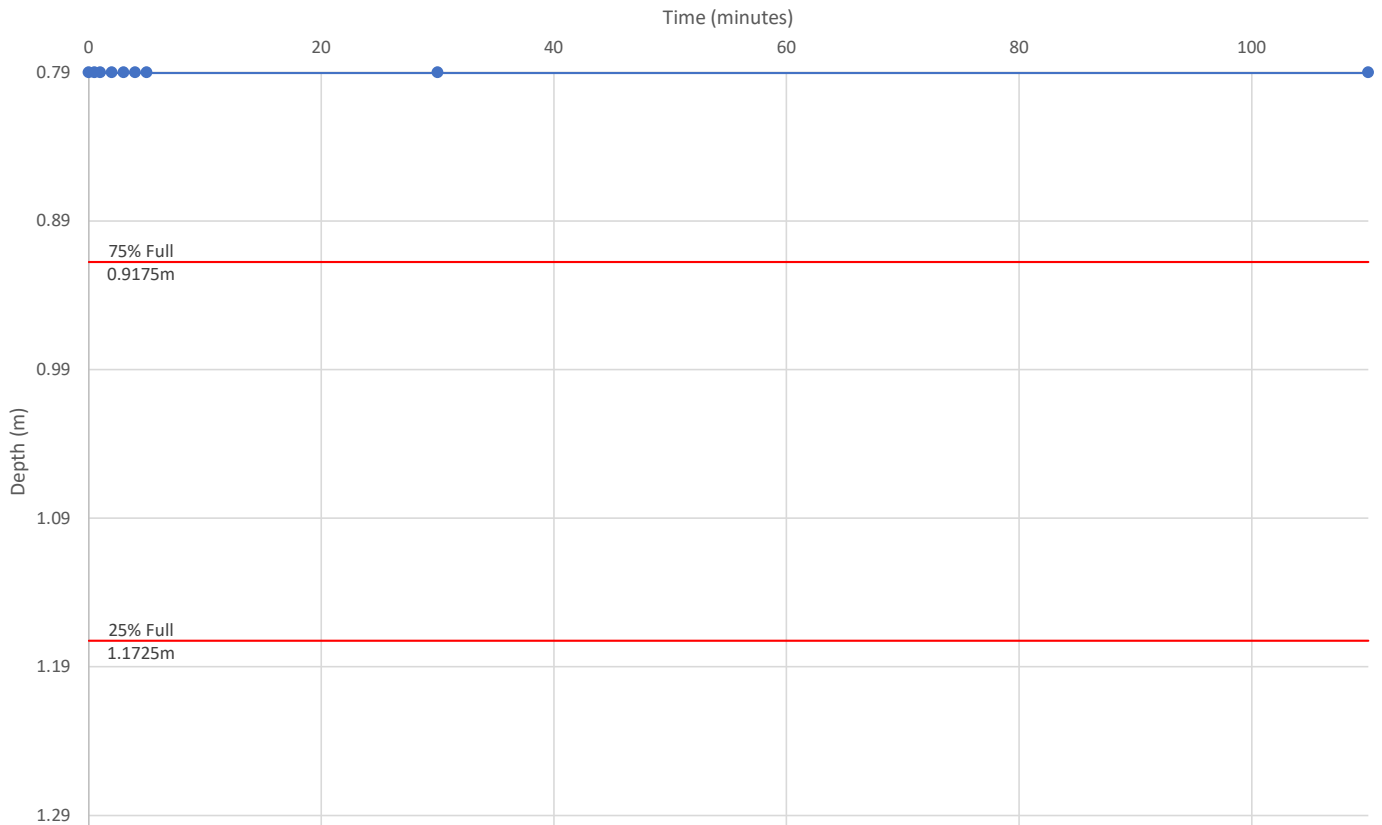
Revision:



T: 01604 781811

E: mail@jppuk.net

W: www.jppuk.net



**Trial pit width = 0.5m**

**Trial pit length = 2.3m**

**Trial pit depth = 1.3m**

$$\text{Soil infiltration rate } f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

**Insufficient infiltration to derive a rate**

$V_{p75-25}$ : the effective storage volume of water in the soakage trial pit between 75% and 25% effective storage depth

$a_{s50}$ : the internal surface area of the soakage trial pit up to 50% effective storage depth and including base area

$t_{p75-25}$ : the time for the water level to fall from 75% to 25% effective storage depth

## Soakaway Test TP03 Cycle 1

Project: Bodicote, Banbury

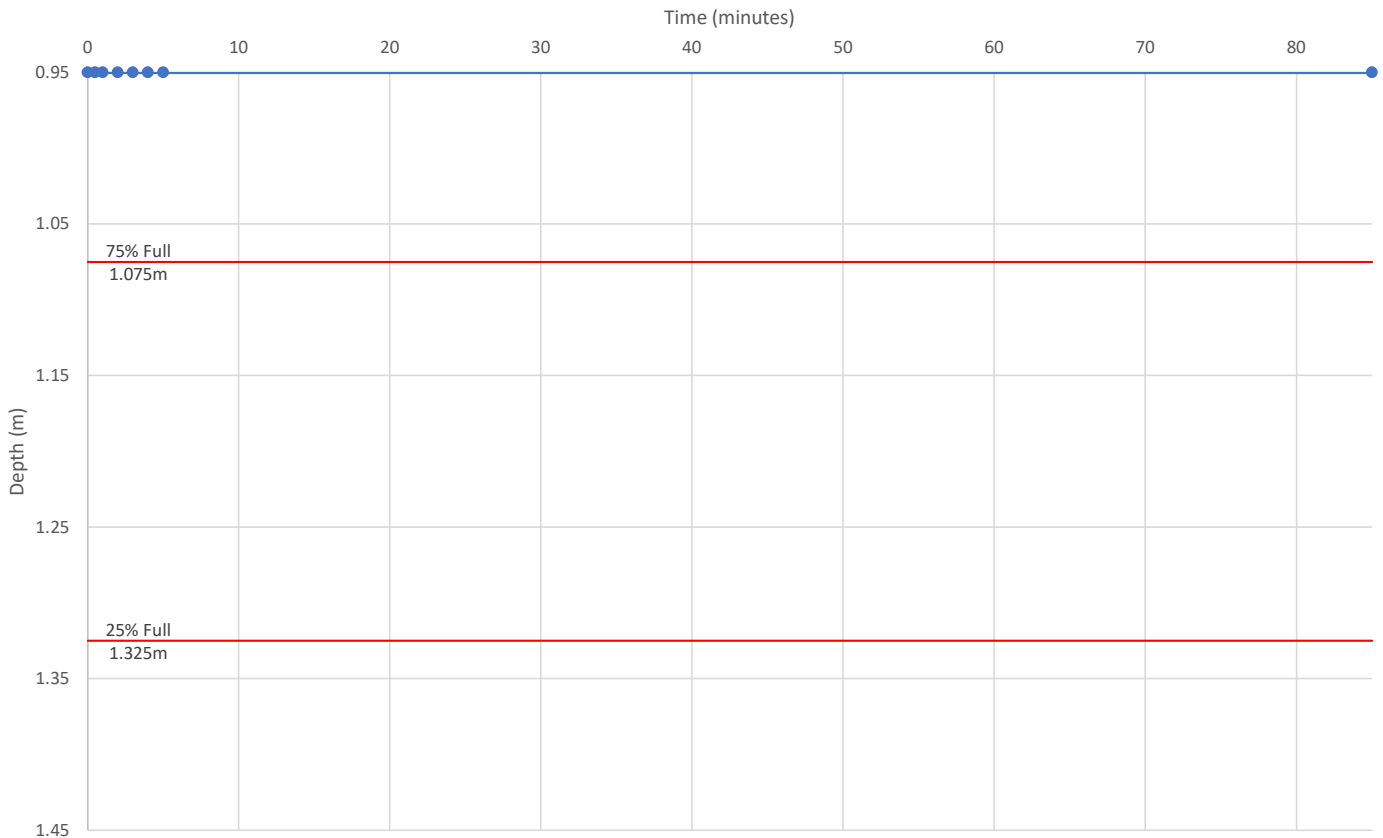
Project Ref: 24934

Date: 19 August 2022

Revision:



T: 01604 781811  
E: mail@jppuk.net  
W: www.jppuk.net



**Trial pit width = 0.5m**

**Trial pit length = 2.4m**

**Trial pit depth = 1.45m**

$$\text{Soil infiltration rate } f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

**Insufficient infiltration to derive a rate**

$V_{p75-25}$ : the effective storage volume of water in the soakage trial pit between 75% and 25% effective storage depth

$a_{s50}$ : the internal surface area of the soakage trial pit up to 50% effective storage depth and including base area

$t_{p75-25}$ : the time for the water level to fall from 75% to 25% effective storage depth

## Soakaway Test TP04 Cycle 1

Project: Bodicote, Banbury

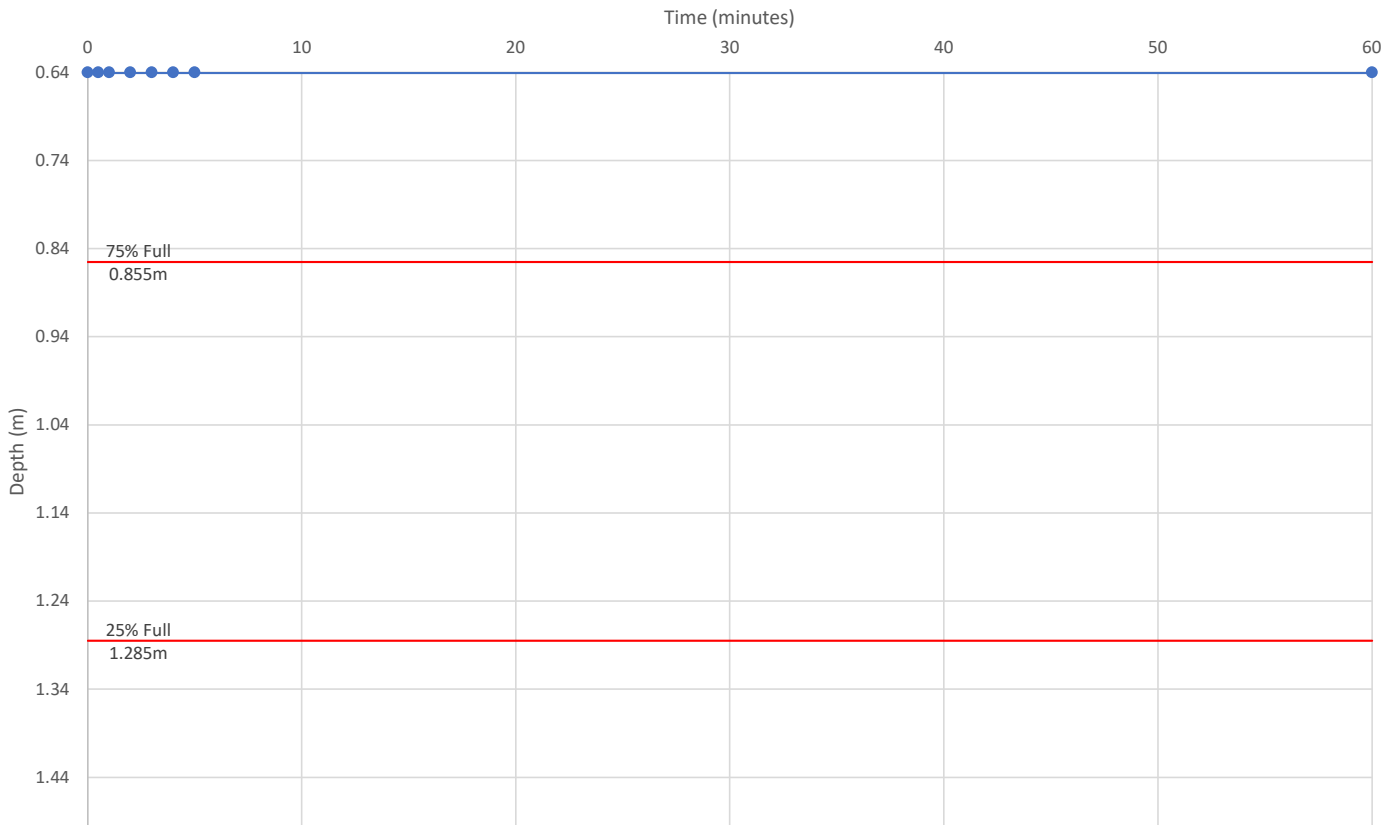
Project Ref: 24934

Date: 19 August 2022

Revision:



T: 01604 781811  
E: mail@jppuk.net  
W: www.jppuk.net



**Trial pit width = 0.5m**

**Trial pit length = 2.3m**

**Trial pit depth = 1.5m**

$$\text{Soil infiltration rate } f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

**Insufficient infiltration to derive a rate**

$V_{p75-25}$ : the effective storage volume of water in the soakage trial pit between 75% and 25% effective storage depth

$a_{s50}$ : the internal surface area of the soakage trial pit up to 50% effective storage depth and including base area

$t_{p75-25}$ : the time for the water level to fall from 75% to 25% effective storage depth



## Soakaway Test TP01 Cycle 1

Project: Bodicote, Banbury

Project Ref: 24934

Date: 19 August 2022

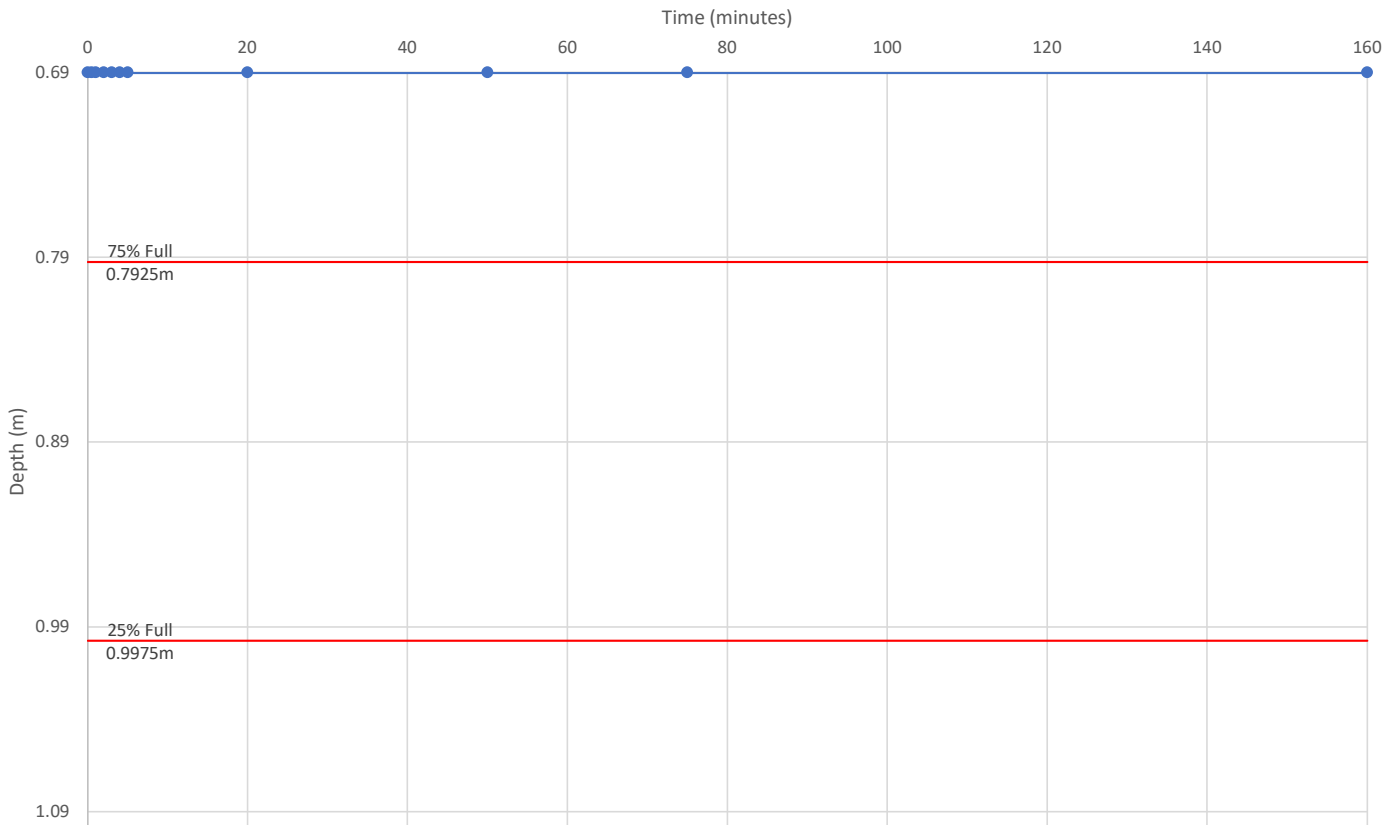
Revision:



T: 01604 781811

E: mail@jppuk.net

W: www.jppuk.net



**Trial pit width = 0.5m**

**Trial pit length = 2.3m**

**Trial pit depth = 1.1m**

$$\text{Soil infiltration rate } f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

**Insufficient infiltration to derive a rate**

$V_{p75-25}$ : the effective storage volume of water in the soakage trial pit between 75% and 25% effective storage depth

$a_{s50}$ : the internal surface area of the soakage trial pit up to 50% effective storage depth and including base area

$t_{p75-25}$ : the time for the water level to fall from 75% to 25% effective storage depth