



Doc. Ref.	28959-CALC-0401
Sheet	1 of 15
Engineer	CW
Date	05.07.24
Revision	-

SOIL INFILTRATION CALCULATIONS FRONT SHEET

SCHEME	Sketchley Grange, Burbage
CLIENT	Persimmon Homes (North Midlands)
ASPECTS OF SCHEME TO BE DESIGNED	Soil Infiltration Rate Testing
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	Soil Infiltration Rate testing and calculations completed in general accordance with BRE Digest 365 utilising the gravel fill/open pit method.
NOTES	The soil infiltration rate calculations should be read in conjunction with the Ground Investigation Report prepared by T&P Regen, reference P0866/CS-1745, dated March 2023. The infiltration rates reported below apply to the specific depth ranges at the test locations as stated on the calculation sheets. Trial pits were excavated in advance of the soil infiltration rate testing to assess the potential presence of groundwater beneath the test levels. Groundwater was not encountered. Soil infiltration rate testing targeted the proposed attenuation pond in the south-west and the areas of Wolston Sand and Gravel Member in the south-east at positions specified by the client. Insufficient soakage was encountered at SA01-SA03 to derive an infiltration rate, likely due to the cohesive nature of the Bosworth Clay and Wolston Sand and Gravel Members at these locations. An infiltration rate of 3.20×10^{-5} m/s was derived in SA04, likely due to the absence of cohesive soils within the predominantly granular matrix at this location. It should be noted that trial pits advanced as part of the previous ground investigation in the south-east of the site (TP16 and TP17) recorded the Wolston Sand and Gravel Member as slightly gravelly, very clayey sand. It is likely that, if testing was undertaken in these areas, results similar to SA03 would have been derived. The results of the testing and ground conditions detailed within the previous Ground Investigation Report indicate that the Wolston Sand and Gravel is predominantly granular but contains a variable cohesive constituency. Where the deposits have been described as more cohesive, the results of the testing indicate that soakaways will not be viable. Less cohesive deposits appear to be restricted to areas around SA04. It is therefore considered that the viability of soakaways is likely to be very limited and that an alternative drainage solution may be required to service the development.



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6	SA03 – Test 1 Insufficient soakage to calculate infiltration rate			
7	SA04 – Test 1 3.40×10^{-5} m/s			
8	SA04 – Test 2 3.20×10^{-5} m/s			
9	SA04 – Test 3 3.31×10^{-5} m/s			
10-15	Exploratory Hole Logs			

* Result in bold identifies lowest calculated value



GENERAL NOTES

1.

DO NOT SCALE THIS DRAWING.

2.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.

3.

ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

4.

THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

KEY

SA01

SOAKAWAY TEST LOCATION

TP01

TRIAL PIT LOCATION

APPROXIMATE SITE BOUNDARY

FIRST ISSUE

CW

XX

DT

05.07.24

REV

AMENDMENTS

DRN

CHK

APP

DATE

PROJECT:

SKETCHLEY GRANGE
BURBAGE

DRAWING TITLE:

EXPLORATORY HOLE
LOCATION PLAN

CLIENT:

PERSIMMON HOMES
NORTH MIDLANDS

DRAWING NUMBER:

28959_04_140_01

REVISION:

-

SHEET SIZE:

A1

SCALE:

1:1000

STATUS:

FOR INFORMATION / APPROVAL

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100055865.



Scheme Sketchley Grange, Burbage
Client Persimmon Homes (North Midlands)
Job ref. 28959

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Calcs by CW
Checked By DT
Date 05.07.24

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. SA01 **Test 1**
Length 1.70 m
Width 0.45 m
Depth 2.00 m
Ground water level Not encountered
Ground conditions 0.00-0.30m Light brown, slightly sandy, slightly gravelly clay TOPSOIL. Gravel comprises fine to coarse, subrounded to subangular, flint, quartzite and brick.
0.30-2.00m Firm to stiff, blueish grey CLAY.

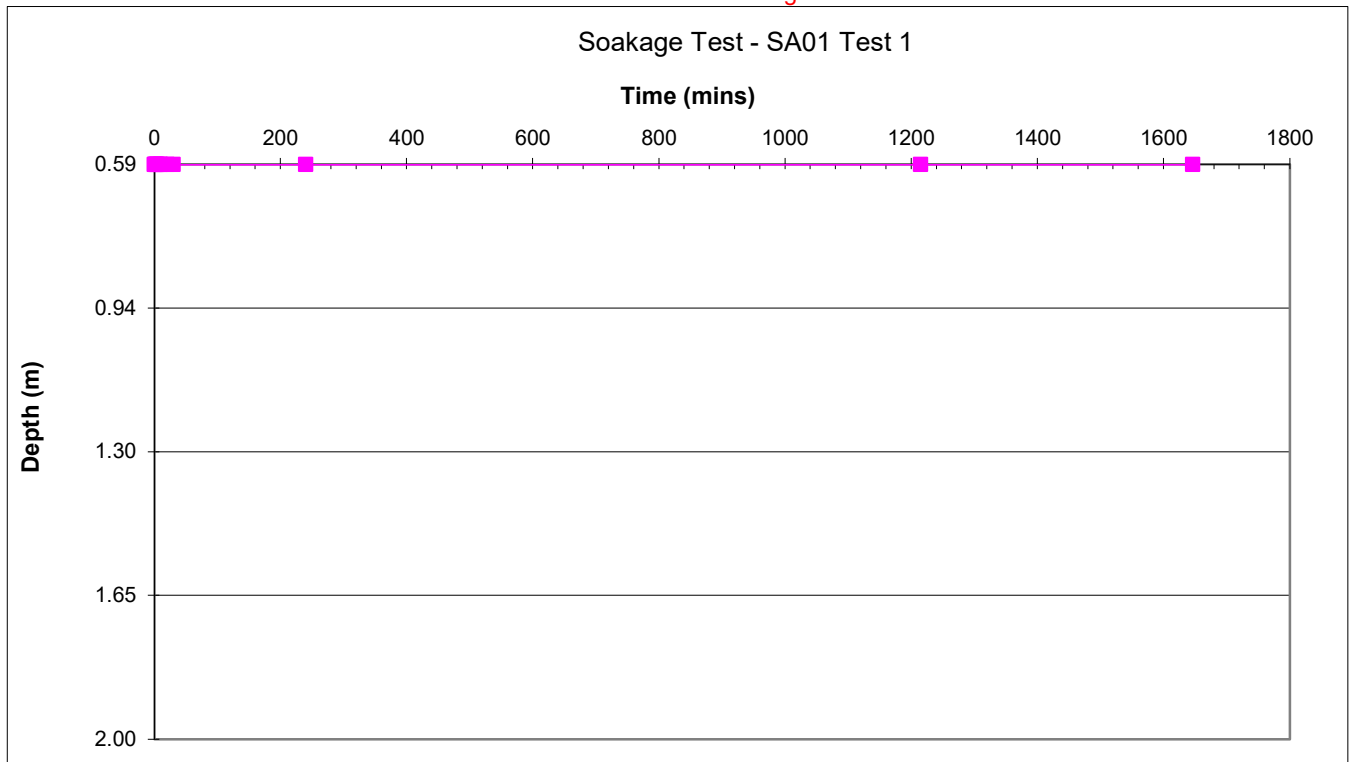
Time (mins)	Depth to water (m bgl)
0	0.59
1	0.59
2	0.59
3	0.59
4	0.59
5	0.59
9	0.59
10	0.59
20	0.59
30	0.59
240	0.59
1215	0.59
1646	0.59

Effective storage depth = 1.41 m
75% effective storage depth = 1.06 m
(ie depth below GL) = 0.94 m
25% effective storage depth = 0.35 m
(ie depth below GL) = 1.65 m
effective storage depth 75%-25% = 0.71 m

Time to fall to 75% effective depth = - mins
Time to fall to 25% effective depth = - mins
Void Ratio = 40%
V (75%-25%) = 0.22 m³
a (50%) = 3.80 m²
t (75%-25%) = - mins

SOIL INFILTRATION RATE = - m/s

Insufficient soakage to derive an infiltration rate





Scheme Sketchley Grange, Burbage
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Checked By DT
Date 05.07.24

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	SA02	Test 1
Length	2.10 m	
Width	0.45 m	
Depth	2.00 m	
Ground water level	Not encountered	
Ground conditions	0.00-0.30m Grass onto brown, slightly sandy, slightly gravelly clay TOPSOIL. Gravel is fine to medium, subrounded to subangular flint.	
	0.30-2.00m Firm to stiff, brown, mottled grey, slightly gravelly CLAY. Gravel is fine to medium, angular to subrounded flint.	

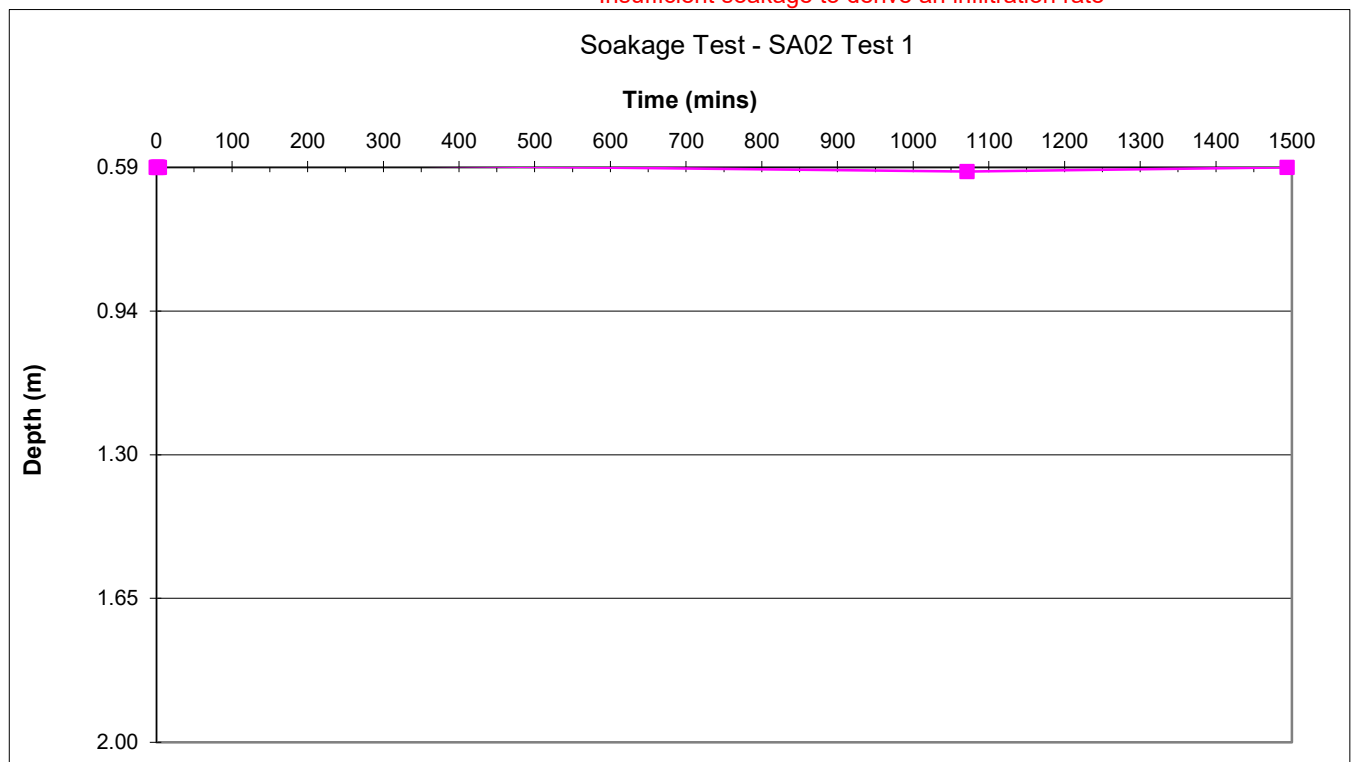
Time (mins)	Depth to water (m bgl)
0	0.59
1	0.59
2	0.59
3	0.59
4	0.59
5	0.58
9	0.58
10	0.58
88	0.58
1071	0.60
1494	0.59

Effective storage depth =	1.41 m
75% effective storage depth =	1.06 m
(ie depth below GL) =	0.94 m
25% effective storage depth =	0.35 m
(ie depth below GL) =	1.65 m
effective storage depth 75%-25% =	0.71 m

Time to fall to 75% effective depth =	- mins
Time to fall to 25% effective depth =	- mins
Void Ratio =	40%
V (75%-25%) =	0.27 m ³
a (50%) =	4.54 m ²
t (75%-25%) =	- mins

SOIL INFILTRATION RATE = - m/s

Insufficient soakage to derive an infiltration rate





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Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. SA03 Test 1
Length 2.40 m
Width 0.45 m
Depth 1.21 m
Ground water level Not encountered
Ground conditions 0.00-0.35m Grass onto brown, slightly sandy, slightly gravelly clay TOPSOIL. Gravel is fine to medium, subangular to subrounded flint and quartzite.
0.35-1.30m Dark brown, clayey, silty SAND with occasional gravel of fine to medium, subrounded flint.

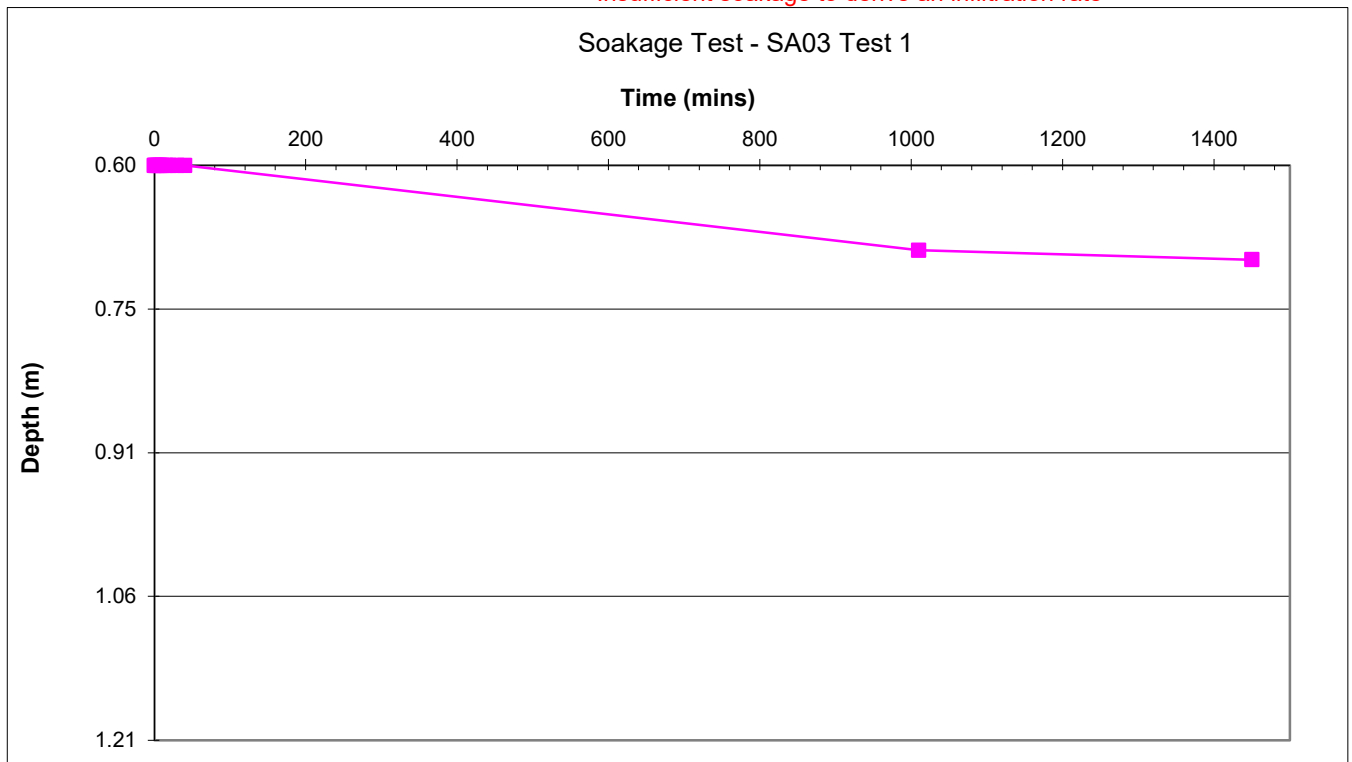
Time (mins)	Depth to water (m bgl)
0	0.60
1	0.60
2	0.60
4	0.60
6	0.60
8	0.60
10	0.60
15	0.60
20	0.60
30	0.60
40	0.60
1010	0.69
1450	0.70

Effective storage depth = 0.61 m
75% effective storage depth = 0.46 m
(ie depth below GL) = 0.75 m
25% effective storage depth = 0.15 m
(ie depth below GL) = 1.06 m
effective storage depth 75%-25% = 0.31 m

Time to fall to 75% effective depth = - mins
Time to fall to 25% effective depth = - mins
Void Ratio = 40%
V (75%-25%) = 0.13 m³
a (50%) = 2.82 m²
t (75%-25%) = - mins

SOIL INFILTRATION RATE = - m/s

Insufficient soakage to derive an infiltration rate





Scheme Sketchley Grange, Burbage
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Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

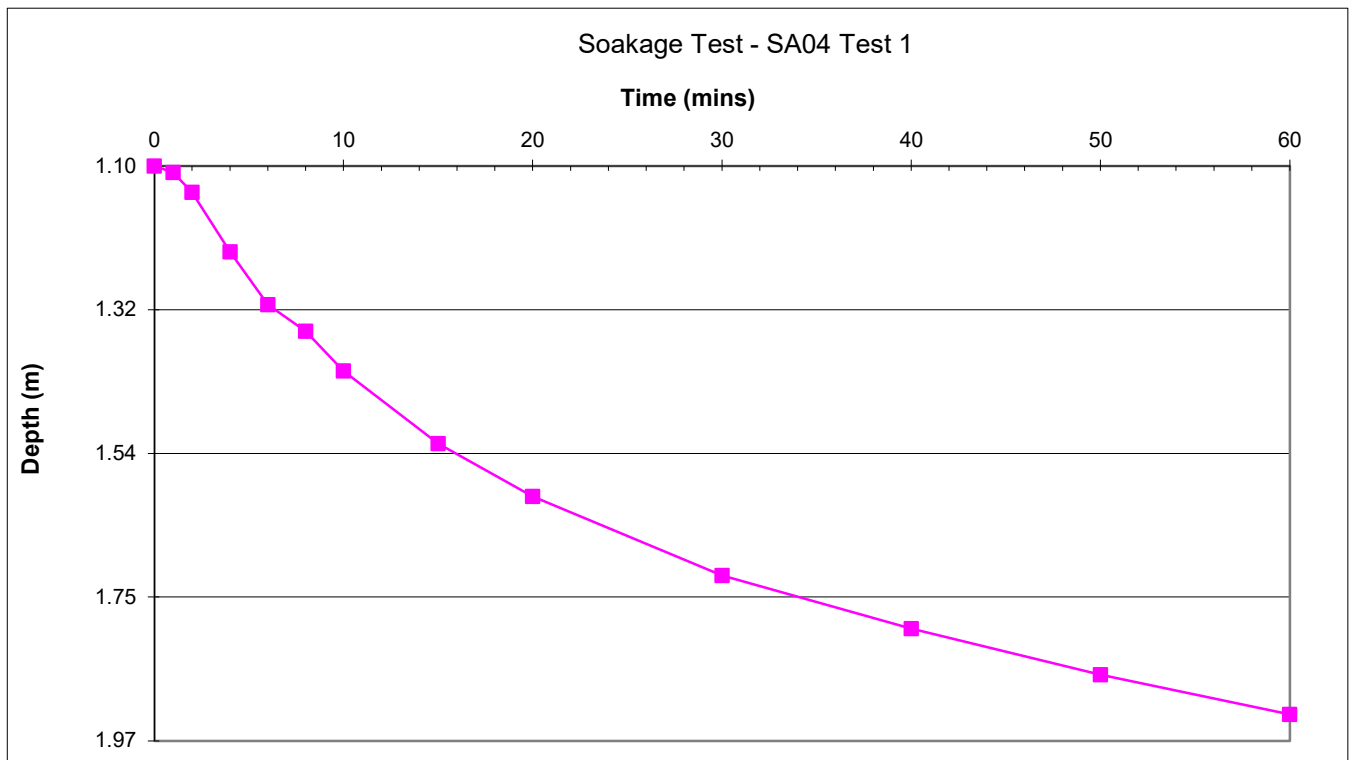
Soakaway pit ref.	SA04	Test 1
Length	2.40 m	
Width	0.50 m	
Depth	1.97 m	
Ground water level	Not encountered	
Ground conditions	0.00-0.20m Grass onto brown, gravelly clayey sand TOPSOIL. Gravel is fine to medium, subrounded flint. 0.20-1.10m Firm, orangish brown, slightly gravelly, sandy CLAY. Gravel is fine to medium, subrounded to subangular, flint, quartzite and sandstone. 1.10-2.00m Fine, yellow silty SAND.	

Time (mins)	Depth to water (m bgl)
0	1.10
1	1.11
2	1.14
4	1.23
6	1.31
8	1.35
10	1.41
15	1.52
20	1.60
30	1.72
40	1.80
50	1.87
60	1.93

Effective storage depth =	0.87 m
75% effective storage depth =	0.65 m
(ie depth below GL) =	1.32 m
25% effective storage depth =	0.22 m
(ie depth below GL) =	1.75 m
effective storage depth 75%-25% =	0.44 m

Time to fall to 75% effective depth =	6.5 mins
Time to fall to 25% effective depth =	34 mins
Void Ratio =	40%
V (75%-25%) =	0.21 m ³
a (50%) =	3.72 m ²
t (75%-25%) =	27.50 mins

SOIL INFILTRATION RATE = 3.40E-05 m/s





Scheme Sketchley Grange, Burbage
Client Persimmon Homes (North Midlands)
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Soil Infiltration Test - Gravel Filled Method

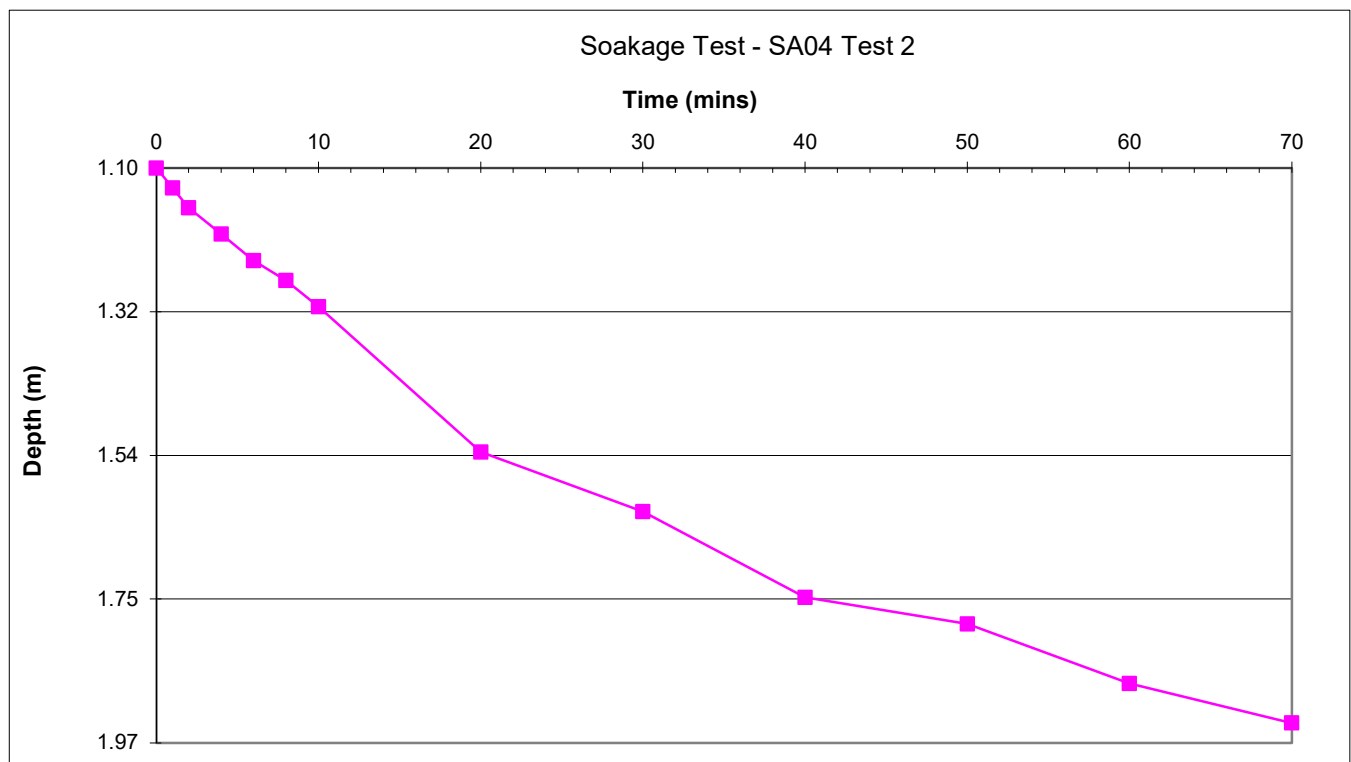
(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	SA04	Test 2
Length	2.40 m	
Width	0.50 m	
Depth	2.00 m	
Ground water level	Not encountered	
Ground conditions	0.00-0.20m Grass onto brown, gravelly clayey sand TOPSOIL. Gravel is fine to medium, subrounded flint.	
	0.20-1.10m Firm, orangish brown, slightly gravelly, sandy CLAY. Gravel is fine to medium, subrounded to subangular, flint, quartzite and sandstone.	
	1.10-2.00m Fine, yellow silty SAND.	

Time (mins)	Depth to water (m bgl)
0	1.10
1	1.13
2	1.16
4	1.20
6	1.24
8	1.27
10	1.31
20	1.53
30	1.62
40	1.75
50	1.79
60	1.88
70	1.94

Effective storage depth =	0.90 m
75% effective storage depth =	0.68 m
(ie depth below GL) =	1.33 m
25% effective storage depth =	0.23 m
(ie depth below GL) =	1.78 m
effective storage depth 75%-25% =	0.45 m
Time to fall to 75% effective depth =	10.5 mins
Time to fall to 25% effective depth =	40 mins
Void Ratio =	40%
V (75%-25%) =	0.22 m ³
a (50%) =	3.81 m ²
t (75%-25%) =	29.50 mins

SOIL INFILTRATION RATE = 3.20E-05 m/s



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Date 05.07.24

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

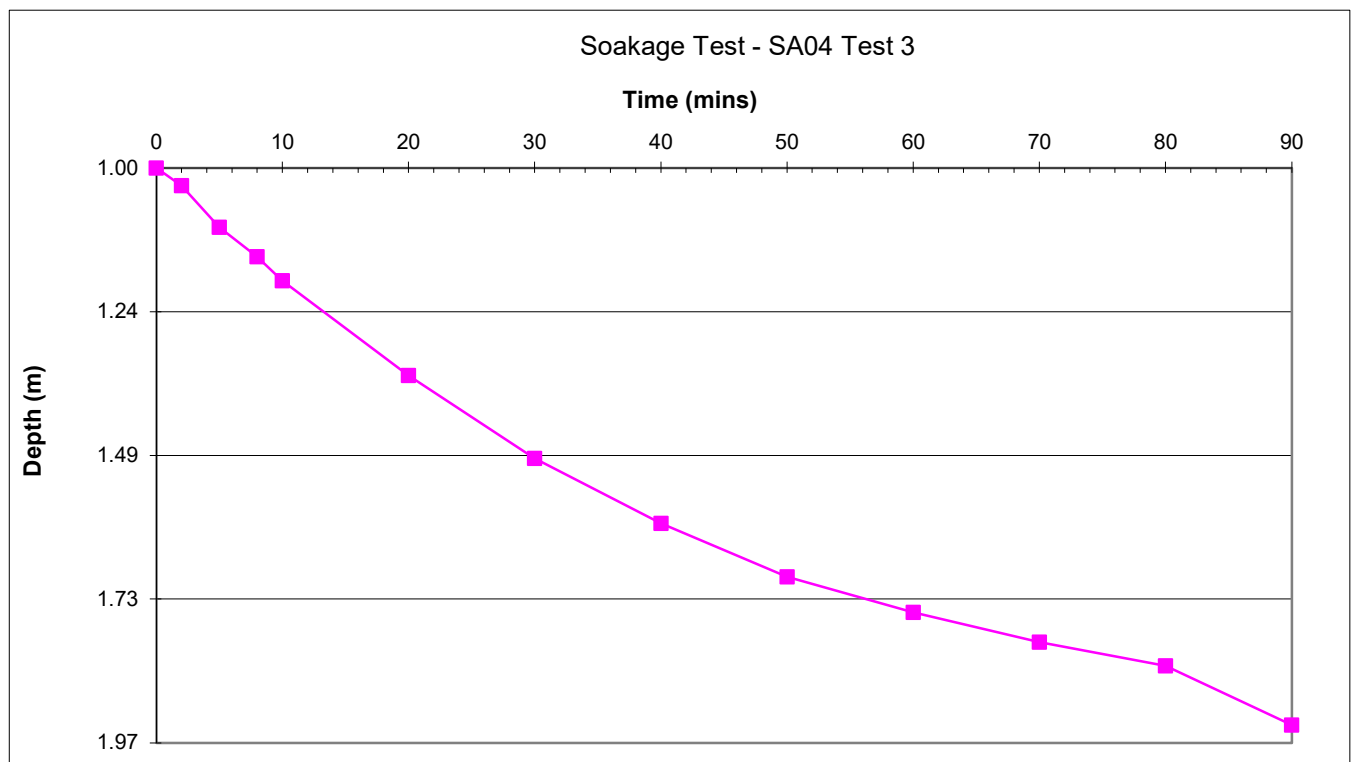
Soakaway pit ref. SA04 Test 3
Length 2.40 m
Width 0.50 m
Depth 2.00 m
Ground water level Not encountered
Ground conditions 0.00-0.20m Grass onto brown, gravelly clayey sand TOPSOIL. Gravel is fine to medium, subrounded flint.
0.20-1.10m Firm, orangish brown, slightly gravelly, sandy CLAY. Gravel is fine to medium, subrounded to subangular, flint, quartzite and sandstone.
1.10-2.00m Fine, yellow silty SAND.

Time (mins)	Depth to water (m bgl)
0	1.00
2	1.03
5	1.10
8	1.15
10	1.19
20	1.35
30	1.49
40	1.60
50	1.69
60	1.75
70	1.80
80	1.84
90	1.94

Effective storage depth = 1.00 m
75% effective storage depth = 0.75 m
(ie depth below GL) = 1.25 m
25% effective storage depth = 0.25 m
(ie depth below GL) = 1.75 m
effective storage depth 75%-25% = 0.50 m

Time to fall to 75% effective depth = 10.5 mins
Time to fall to 25% effective depth = 40 mins
Void Ratio = 40%
V (75%-25%) = 0.24 m³
a (50%) = 4.10 m²
t (75%-25%) = 29.50 mins

SOIL INFILTRATION RATE = 3.31E-05 m/s





Sheet 1 of 1

Plant Used.

Elevation (m AOD):	
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104.70

Remarks: Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator. Descriptions based on visual inspection by a Geo-environmental engineer. Groundwater was not encountered. Visual or olfactory evidence of contamination was not observed. Co-ordinates and elevations estimated from the topographical survey.	Dimensions: Width: Length:	Key: B - Bulk Sample D - Disturbed Sample ES - Environmental Sample W - Water Sample PID - PID Reading HSV - Hand Shear Vane Reading
Stability: Stable	Depth: 2.00m	



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LE67 2GB

Exploratory
Hole ID:

SA02
Sheet 1 of 1

Project:	Sketchley Grange	Project No.	28959	Start Date:	02/07/2024	End Date:	02/07/2024	Plant Used:	Tracked excavator
Location:	Burbage	Logged By:	RF	Easting and Northing Co-ordinates:		Elevation (m AOD):		108.80	
Client:	Persimmon Homes North Midlands	Approved By:	DT						

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples		Tests	Groundwater (m)
				Type	Depth		
Grass onto brown, slightly sandy, slightly gravelly clay TOPSOIL. Gravel is fine to medium, subrounded to subangular flint.		0.30	108.50				
Firm, brown, occasionally mottled grey, slightly gravelly CLAY. Gravel is fine to medium, angular to subrounded flint. WOLSTON SAND AND GRAVEL							
Mottled reddish brown from 1.00m							
Grey and orange mottling from 1.50m							
End of Trial Pit		2.00	106.80				

Remarks: Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator. Descriptions based on visual inspection by a Geo-environmental engineer. Groundwater was not encountered. Visual or olfactory evidence of contamination was not observed.	Dimensions: Width: 0.45m Length: 2.10m Depth: 2.00m	Key: B - Bulk Sample D - Disturbed Sample ES - Environmental Sample W - Water Sample PID - PID Reading HSV - Hand Shear Vane Reading
Stability: Stable		



Sheet 1 of 1

Plant Used.

Elevation (m AOD):	
--------------------	--

112.20

Groundwater
(m)

--	--

110.90

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

Stability: Stable



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Exploratory
Hole ID:

SA04
Sheet 1 of 1

Project:	Sketchley Grange	Project No.	28959	Start Date:	02/07/2024	End Date:	02/07/2024	Plant Used:	Tracked excavator
Location:	Burbage	Logged By:	RF	Easting and Northing Co-ordinates:		Elevation (m AOD):			
Client:	Persimmon Homes North Midlands	Approved By:	DT						

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples		Tests	Groundwater (m)
				Type	Depth		
Grass onto brown, gravelly, clayey sand TOPSOIL. Gravel is fine to medium, subrounded flint.		0.20	114.05				
Firm, orangish brown, sandy, slightly gravelly CLAY. Gravel is fine to medium, subrounded to subangular, flint, quartzite and sandstone. WOLSTON SAND AND GRAVEL							
Fine, yellow, silty SAND. WOLSTON SAND AND GRAVEL <i>Occasional black carbonaceous staining</i>		1.10	113.15				
End of Trial Pit		2.00	112.25				

Remarks: Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator. Descriptions based on visual inspection by a Geo-environmental engineer. Groundwater was not encountered. Visual or olfactory evidence of contamination was not observed. Co-ordinates and elevations estimated from the topographical survey.	Dimensions: Length: 2.40m Width: 0.50m Depth: 2.00m	Key: B - Bulk Sample D - Disturbed Sample ES - Environmental Sample W - Water Sample PID - PID Reading HSV - Hand Shear Vane Reading
Stability: Stable		



Project:	Sketchley Grange	Project No.	28959	Start Date:	02/07/2024	End Date:	02/07/2024	Plant Used:	Tracked excavator
Location:	Burbage	Logged By:	RF	Easting and Northing Co-ordinates:		Elevation (m AOD):			
Client:	Persimmon Homes North Midlands	Approved By:	DT						

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples		Tests	Groundwater (m)
				Type	Depth		
Grass onto brown, slightly sandy, slightly gravelly clay TOPSOIL. Gravel is fine to medium, subangular to subrounded, flint and quartzite.		0.35	111.05				
Dark brown, clayey, silty SAND with occasional gravel of fine to medium, subrounded flint. WOLSTON SAND AND GRAVEL		1.60	109.80				
Firm, blueish grey CLAY. BOSWORTH CLAY		2.30	109.10				
End of Trial Pit							

Remarks: Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator. Descriptions based on visual inspection by a Geo-environmental engineer. Groundwater was not encountered. Visual or olfactory evidence of contamination was not observed. Co-ordinates and elevations estimated from the topographical survey.	Dimensions: Length: 2.60m Width: 0.45m Depth: 2.30m	Key: B - Bulk Sample D - Disturbed Sample ES - Environmental Sample W - Water Sample PID - PID Reading HSV - Hand Shear Vane Reading
Stability: Stable		



Project:	Sketchley Grange	Project No.	28959	Start Date:	02/07/2024	End Date:	02/07/2024	Plant Used:	Tracked excavator
Location:	Burbage	Logged By:	RF	Easting and Northing Co-ordinates:		Elevation (m AOD):		112.20	
Client:	Persimmon Homes North Midlands	Approved By:	DT						

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples		Tests	Groundwater (m)
				Type	Depth		
Grass onto brown, gravelly, clayey sand TOPSOIL. Gravel is fine to medium, subrounded flint.		0.30	111.90				
Orangish brown, gravelly, clayey SAND. Gravel is fine to medium, subrounded to subangular, flint and quartzite. WOLSTON SAND AND GRAVEL							
Soft, grey sandy SILT. BOSWORTH CLAY		1.00	111.20				
Soft, orangish brown, mottled grey, silty, sandy CLAY with rare carbonaceous staining.		1.20	111.00				
End of Trial Pit							
		2.90	109.30				

Remarks: Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator. Descriptions based on visual inspection by a Geo-environmental engineer. Groundwater was not encountered. Visual or olfactory evidence of contamination was not observed. Co-ordinates and elevations estimated from the topographical survey.	Dimensions: Length: 2.60m Width: 0.60m Depth: 2.90m	Key: B - Bulk Sample D - Disturbed Sample ES - Environmental Sample W - Water Sample PID - PID Reading HSV - Hand Shear Vane Reading
Stability: Sidewall collapse from 1.00m to the base of the pit		