

Our Ref J4044/17/E
28th September 2017

Mason Clark Associates
Church house
44 Newland Park
Hull
HU5 2DW

Environmental
Geotechnical
Specialists



For the attention of Mrs Hayley Smith

Dear Hayley

Ref: Soakaway Testing at Acorn Lodge, Barnsley

We thank you for your request to undertake percolation testing at the above mentioned site and take pleasure in enclosing the results of this work. The investigation was undertaken on the 25th September in accordance with your instruction to proceed. This letter describes the work undertaken, presents the data obtained and discusses the results of the tests.

Fieldworks

Two trialpits were excavated using a JCB 3CX in order to carry out soakaway testing. The tests were undertaken at the base of the pit at depths rational to the construction of soakaways. The soils exposed in the trial pits were logged on site in general accordance with BS5930: 2015 and full descriptions are given on the trialpit records which are also attached to this letter, along with the soakaway test results.

Geology

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 1: Geological Data for the Site

Strata Type	Strata Name ¹	Previous Name	Description ²
Superficial Geology	N/A	N/A	None indicated within the published records.
Solid Geology	Woolley Edge Rock	N/A	Sandstone, coarse-grained in the north, becoming finer southwards.

¹ Sources: British Geological Survey (NERC) Map Sheets 87; Barnsley; Solid and Drift Edition, and the Geology of Britain Viewer [online resource from www.bgs.ac.uk]

² Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [online resource from www.bgs.ac.uk]

Strata Conditions

During the investigation the geological succession has been shown to include the following:

Table 2: Generalised strata profile

Depth to base (m)	Strata type	Positions strata was revealed	Groundwater strikes (m)
0.25 – 0.45	MADE GROUND (Granular)	Both	None
0.97 – +1.95	Sandy gravelly CLAY (Weathered rock)	Both	None
+1.0	SANDSTONE (Woolley Edge Rock)	TP2	None

'+' denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated.

The trialpits were excavated within a basketball court. Beneath the playing surface, a granular sub-base of dolostone gravel was found to depths of up to 0.45m. Underlying this sub-base, sandy clay containing sandstone gravel and cobbles was revealed to the termination depths of the trialpits. These soils are anticipated to represent the weathered fraction of the Woolley Edge Rock, a named sandstone member. It should be appreciated that sandstone, recovered as tabular fine gravel was observed at the base of TP2.

Soakaway Tests

On reaching the elected soakaway test depth, the pit was trimmed and squared as much as practicable. Water was then introduced into the pit at a controlled rate to prevent collapse of the sides and the level monitored at time intervals relative to a reference bar at ground level. The results obtained from the soakaway tests are appended to this letter and are summarised below:

Table 3: Soakaway Test Results

Location	Soakage Area Dimensions (average) (m)	Test Depth (m)	Soil Description (base of pit)	Infiltration Rate (m/sec)	Drainage Characteristics
TP1	1.8 x 0.4	1.95	Sandy gravelly CLAY	*	Practically impermeable
TP2	1.95 x 0.4	0.98	Sandy gravelly CLAY	*	Practically impermeable

During the soakaway tests the water level did not achieve a fall from 75% to 25% of the effective depth of the storage volume in the two trialpits. The tests, therefore, could not be completed within the scope of the method provided in BRE Digest 365 due to the poor soakage rate of the exposed soils. Due to the negligible water movement it was not possible to extrapolate the results obtained in order to obtain a soil infiltration rate.

Discussion

The soils encountered beneath the site were found to be typical of weathered sandstone, comprising sandy clays with gravel and a low cobble content. The strata conditions and drainage characteristics appear to be comparable across the site.

In this instance the recorded infiltration rates suggest that the soils have poor drainage characteristics. Therefore, soakaways cannot be recommended at this site and an alternative form of drainage should be adopted.

References

Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.

British Standards Institution (1999) BS5930: *Code of practice for site investigations*, B.S.I., London.

British Standards Institution (2007), Amendment No 1, BS5930: *Code of practice for site investigations*, B.S.I., London.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For and on behalf of
Rogers Geotechnical Services,

Yours Faithfully

R.A. Palmer MSc FGS
Geotechnical and Environmental Engineer

C. E. Mason BSc FGS
Graduate Geotechnical Engineer



Plan not to scale and investigation positions approximated from site operative's notes.

Title: **Investigation Location Plan**



Rogers **Geotechnical Services** Ltd

Site Name:
Acorn Lodge

Job No:
J4044/17/E



Trial Pit Log

Trialpit No

TP1

Sheet 1 of 1

Project Name: Acorn Lodge

Project No.
J4044/17/E

Co-ords: -

Level:

Date

25/09/2017

Location: Upper Sheffield Road, Barnsley S70 4PL

Dimensions
(m):

1.8

Depth
1.95

0.4

Scale

1:50

Logged
JDMI

Client: Mason Clark Associates

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.06 0.25			MADE GROUND. (Brown textile topped gravelly SAND. Gravel is sub-rounded and rounded sub-spherical fine sandstone).
							MADE GROUND. (Cream sandy sub-angular to sub-rounded sub-spherical fine to coarse GRAVEL of dolostone).
							Firm inpart friable brown mottled orange and grey sandy gravelly CLAY with low cobble content. Gravel is angular and sub-angular cubic and tabular fine to coarse sandstone lithorelicts. (Weathered Woolley Edge Rock).
				1.95			End of pit at 1.95 m

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Remarks: Trialpit soakaway.

Stability:





Trial Pit Log

Trialpit No

TP2

Sheet 1 of 1

Project Name: Acorn Lodge

Project No.
J4044/17/ECo-ords: -
Level:Date
25/09/2017

Location: Upper Sheffield Road, Barnsley S70 4PL

Dimensions
(m):

1.95

Depth
0.95

0.4

Scale

1:50

Logged
JDMI

Client: Mason Clark Associates

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.08			MADE GROUND. (Brown textile topped gravelly SAND. Gravel is sub-rounded and rounded sub-spherical fine sandstone).	
				0.45			MADE GROUND. (Cream sandy sub-angular to sub-rounded sub-spherical fine to coarse GRAVEL of dolostone).	
				0.97			Firm orangish brown sandy CLAY. (Weathered Woolley Edge Rock).	1
				0.98			Strong orangish brown SANDSTONE recovered as sandy angular cubic and tabular fine gravel.	
							End of pit at 0.95 m	
								2
								3
								4
								5
								6
								7
								8
								9
								10

Remarks: Trialpit soakaway.

Stability:

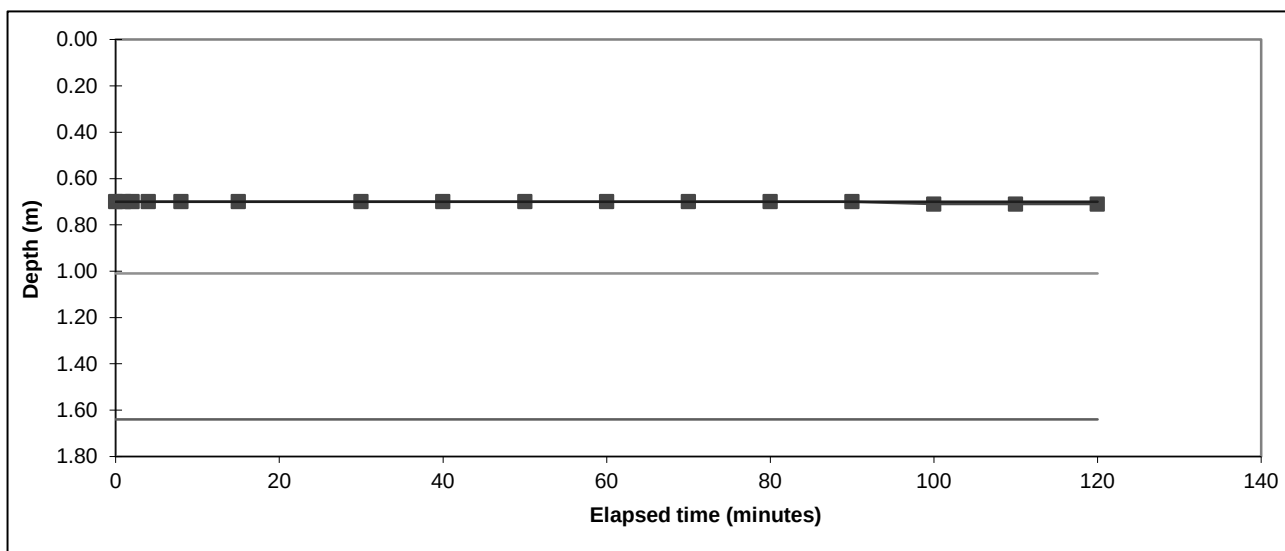


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Soakaway Test

Trial Pit No:	TP1	Test No:	1	Date:	25/09/2017
Length (m):	1.800	Datum Height:			0.00 m agl
Width (m):	0.40	Granular infill:	None		
Depth (m):	1.95	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.700	110	0.710
1	0.700	120	0.710
2	0.700		
4	0.700		
8	0.700		
15	0.700		
30	0.700		
40	0.700		
50	0.700		
60	0.700		
70	0.700		
80	0.700		
90	0.700		
100	0.710		



Start water depth for analysis (mbgl):	0.70		
75% effective depth (mbgl):	1.01	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.33		
25% effective depth (mbgl):	1.64	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.95		

Volume outflow between 75% and 25% effective depth (m³):

Mean surface area of outflow (m²): 3.45

(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
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Remarks Results processed following BRE 365 (2007).

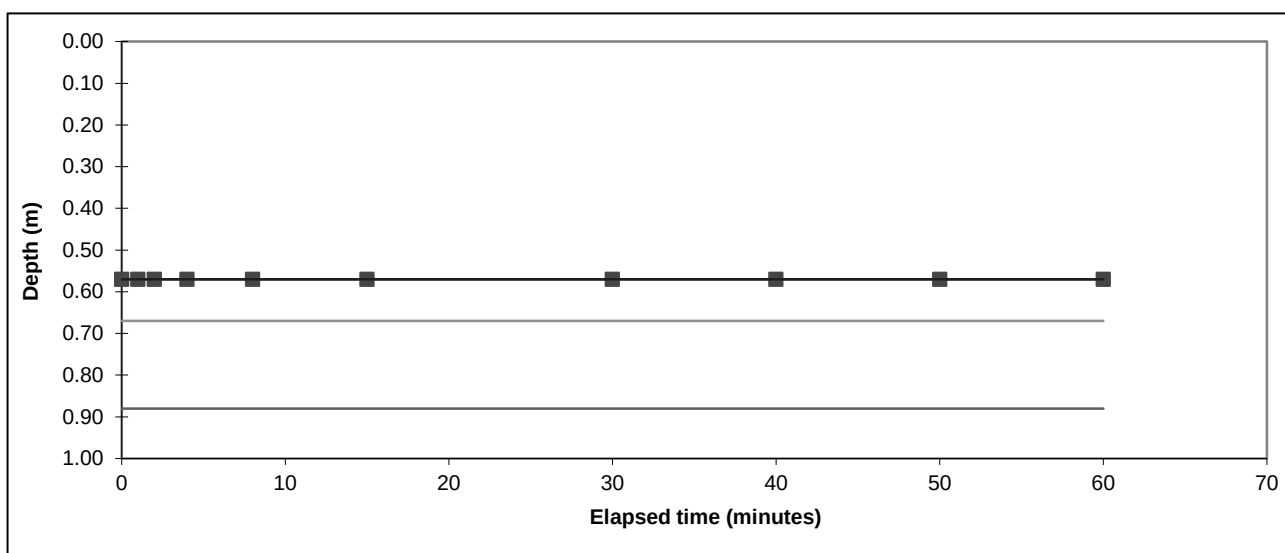
Client: Mason Clark Associates
Site: Acorn Lodge

Job No: J4044/17/E

Rogers Geotechnical Services Ltd

Soakaway Test

Trial Pit No:	TP2	Test No:	1	Date:	25/09/2017
Length (m):	1.950	Datum Height:			0.00 m agl
Width (m):	0.40	Granular infill:	None		
Depth (m):	0.98	Porosity of infill:	1	(assumed)	
	Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)	
	0	0.570			
	1	0.570			
	2	0.570			
	4	0.570			
	8	0.570			
	15	0.570			
	30	0.570			
	40	0.570			
	50	0.570			
	60	0.570			



Start water depth for analysis (mbgl):	0.57		
75% effective depth (mbgl):	0.67	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	0.78		
25% effective depth (mbgl):	0.88	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	0.98		

Volume outflow between 75% and 25% effective depth (m³):

Mean surface area of outflow (m²): 1.72

(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
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Remarks Results processed following BRE 365 (2007).
Unable to run test at 2.0m as specified due to unstable pits (loose sands/gravels).

Client: Mason Clark Associates
Site: Acorn Lodge

Job No: J4044/17/E