

Our Ref: YE7990

20th January 2020

For the attention of GD Group,

Ref: Arundel Road, Angmering

We thank you for your request to undertake permeability testing at the above mentioned site and take pleasure in enclosing the results of this work. The investigation was undertaken on the 15th January 2020 in accordance with your instruction to proceed. This letter describes the work undertaken, presents the data obtained and discusses the results of the tests.

Geology

An examination of the available British Geological Survey data of the area for the site has been examined and indicates that the site has superficial drift deposits in the southern portion composed of the Head Deposits (clay, silt, sand and gravel), and bedrock deposits recorded as the London Clay Formation (clay, silt and sand).

Fieldworks

The programme of this investigation included the excavation of five trial pits. The locations of the soakaway tests were selected and excavated by the client.

During this work, the soils encountered were logged in general accordance with BS 5930: 1990, as amended in 2007, and full descriptions are given on the borehole records, which are also appended to this letter.

Soakaway Tests

During the soakaway tests the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume in all locations. The results obtained from the soakaway tests are summarised below:

Table 1: Soakaway Test Results

WS	Soakage Area Dimensions (m)	Depth (m)	Soil Description (Base of TP)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 test 1	3.00 x 0.60	1.50	Light brown gravelly sandy CLAY. Sand is fine. Gravel is very occasional, angular of flint.	N/ A	Practically Impermeable
TP02 test 1	2.50 x 0.80	0.80	Light brown sandy CLAY. Sand is fine.	N/ A	Practically Impermeable
TP03 test 1	2.55 x 0.66	1.60	Light brown CLAY.	N/ A	Practically Impermeable
TP04 test 1	3.00 x 0.60	0.90	Light brown CLAY.	N/ A	Practically Impermeable

TP05 test 1	2.50 x 0.60	1.55	Light brown silty CLAY.	N/ A	Practically Impermeable
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Discussion

The soils encountered beneath the site were found to be predominantly CLAY. The soakage rates obtained during the investigation were found to be poor to practically impermeable. Given the data from the test, it is considered that the use of soakaways is not suitable for this site.

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

Your Environment

Yours Faithfully,

Mathew Griffiths

Geo-Environmental Engineer

Enc.

Appendix A: Site Investigation Plan

Appendix B: Trial Pit Logs

Appendix C: Soakaway Test Results

Appendix D: Photographs

APPENDIX A: Site Investigation Plan





KEY:

- :recycle + refuse bins
- :pedestrian paving
- :1.8m screen fence
- :garden gates
- :secure cycle parking
- :non adoptable road
- :disabled parking bay
- :private driveway and parking bay
- :visitor parking bay
- :site boundary

note: refer to HUSKISSON
BROWN landscape layout for
material details: HBA/790/01

This drawing is protected under
The Copyright, Designs and Patents Act 1988

**THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL OTHER PROJECT, CONSULTANT +
SPECIALIST CONTRACTORS DOCUMENTATION
Do not scale, except for Planning purposes only.
Figured dimensions only are to be taken from this drawing. All
dimensions are to be checked on site before any work is put
in hand.**

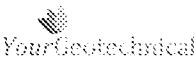
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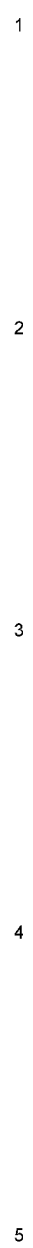
key:

revisions:
FIRST ISSUE:

APPENDIX B: Trial Pit Logs



				TP01			Trial Pit Log		TrialPit No TP01 Sheet 1 of 1	
Project Name: Arundel Road.				Project No. YE7990		Co-ords: - Level:		Date 15/01/2020		
Location:						Dimensions (m):		3.00		Scale 1:25
Client: GD Group.						Depth 1.50				Logged
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
				0.30			Brown sandy, gravelly CLAY. Frequent roots noted.			
				0.70			Light brown clayey SAND. Sand is fine.			
				1.50			Light brown sandy, gravelly CLAY. Sand is fine. Gravel is very occasional, angular of flint.			
							End of Pit at 1.50m			
Remarks: Stability: 										

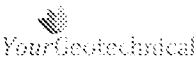
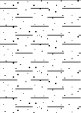


TP03				Trial Pit Log				TrialPit No TP03 Sheet 1 of 1	
Project Name: Arundel Road.				Project No. YE7990		Co-ords: - Level:		Date 15/01/2020	
Location:						Dimensions (m):		Scale 1:25	
Client: GD Group.						Depth 1.60		Logged	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			Dark brown clayey, gravelly SAND. Frequent roots noted.	
							Light brown gravelly CLAY. Gravel is occasional of flint.	
				1.00			Light brown CLAY.	1
				1.60			End of Pit at 1.60m	2
								3
								4
								5

Remarks:

Stability:

 TP04				Trial Pit Log				TrialPit No TP04 Sheet 1 of 1	
Project Name: Arundel Road.				Project No. YE7990		Co-ords: - Level:		Date 15/01/2020	
Location:						Dimensions (m): 3.00		Scale 1:25	
Client: GD Group.						Depth 0.90		Logged	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
				0.40			Brown sandy CLAY. Sand is fine.		
							Light brown CLAY.		
							End of Pit at 0.90m		
							1		
							2		
							3		
							4		
							5		
Remarks:									
Stability:									



APPENDIX C: Soakaway Test Results

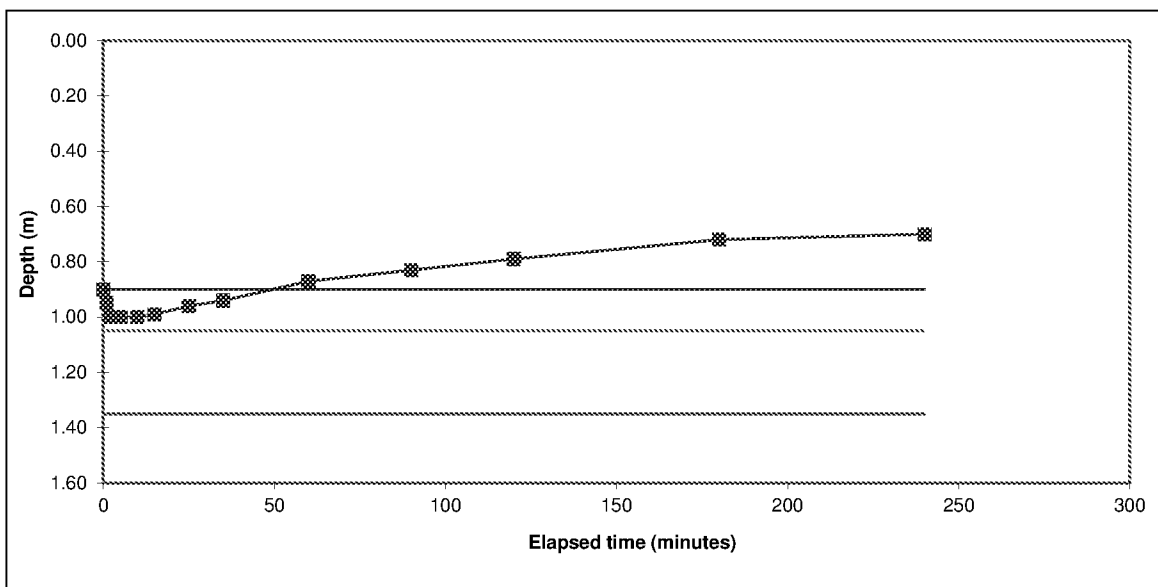


Your Environment

Soakaway Test

Trial Pit No:	TP1	Test No:	1	Date:	15.01.20
Length (m):	3.000	Datum Height:		0.00 m agl	
Width (m):	0.60	Granular infill:	None		
Depth (m):	1.50	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.900	240	0.700
1	0.950		
2	1.000		
3	1.000		
4	1.000		
5	1.000		
10	1.000		
15	0.990		
25	0.960		
35	0.940		
60	0.870		
90	0.830		
120	0.790		
180	0.720		



Start water depth for analysis (mbgl)	0.90		
75%effective depth (mbgl):	1.05	Elapsed time (mins):	#N/ A
50%effective depth (mbgl):	1.20		
25%effective depth (mbgl):	1.35	Elapsed time (mins):	#N/ A
Base of soakage zone (mbgl):	1.50		
Volume outflow between 75%and 25%effective depth (m³):			
Mean surface area of outflow (m²):		3.96	
(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.
Remarks	Results processed following BRE 365 (2007). Surface water infilled the pit at a rate greater than the rate of infiltration rate.

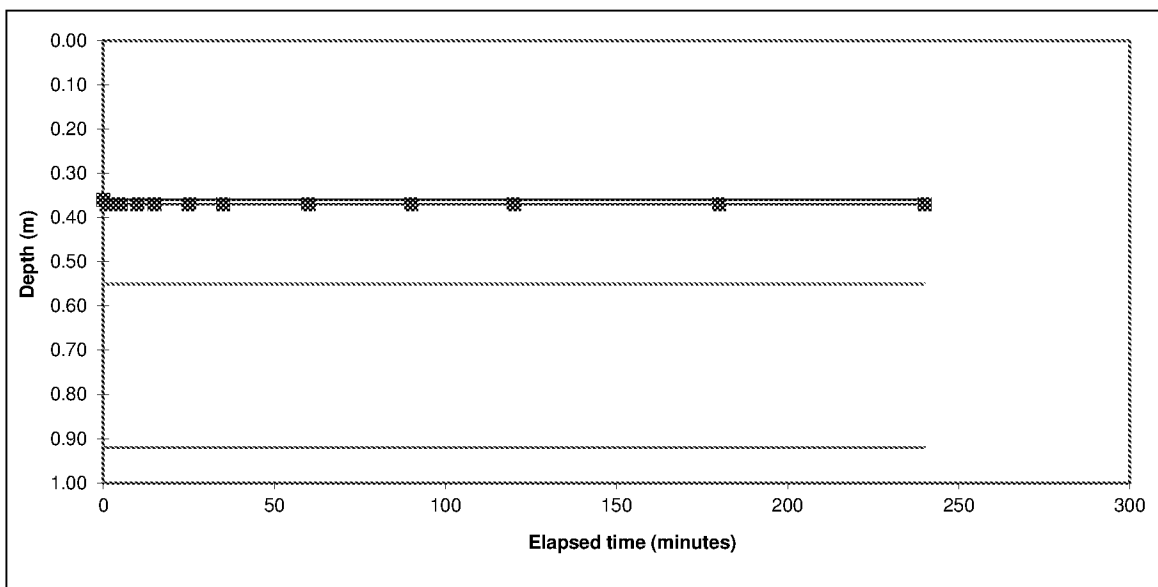
Client:	GD Group	TP1
Site:	Arundel Road	

Your Environment

Soakaway Test

Trial Pit No:	TP2	Test No:	1	Date:	15.01.20
Length (m):	2.500	Datum Height:	0.00 m agl		
Width (m):	0.80	Granular infill:	None		
Depth (m):	1.10	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.360	240	0.370
1	0.370		
2	0.370		
3	0.370		
4	0.370		
5	0.370		
10	0.370		
15	0.370		
25	0.370		
35	0.370		
60	0.370		
90	0.370		
120	0.370		
180	0.370		



Start water depth for analysis (mbgl)	0.36		
75%effective depth (mbgl):	0.55	Elapsed time (mins):	#N/ A
50%effective depth (mbgl):	0.73		
25%effective depth (mbgl):	0.92	Elapsed time (mins):	#N/ A
Base of soakage zone (mbgl):	1.10		
Volume outflow between 75%and 25%effective depth (m³):			
Mean surface area of outflow (m²):			4.44
(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.	
Remarks Results processed following BRE 365 (2007).			

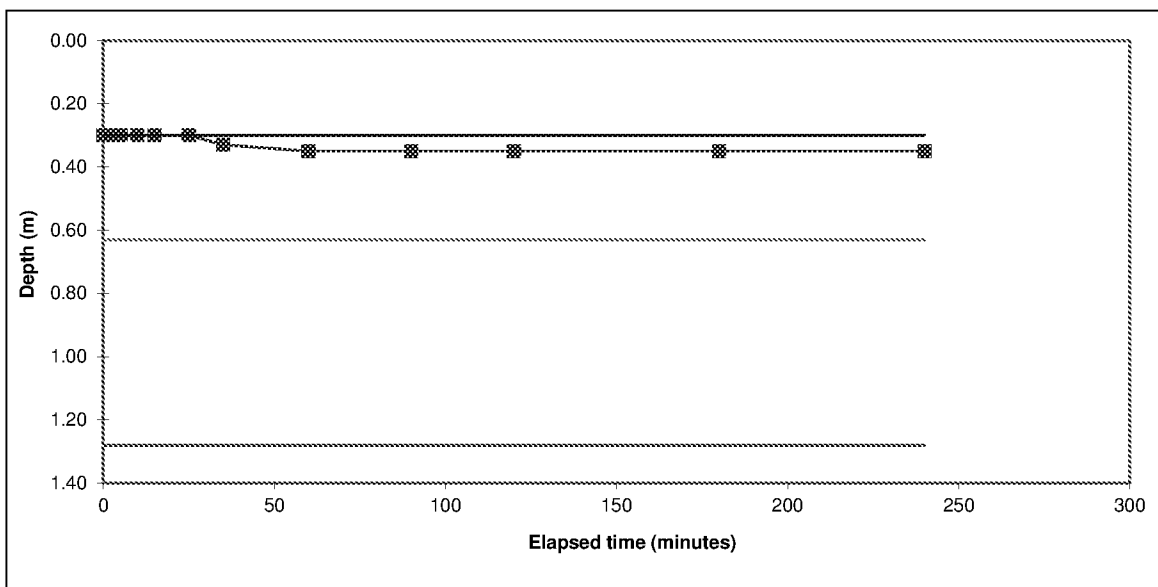
Client:	GD Group	TP2
Site:	Arundel Road	

Your Environment

Soakaway Test

Trial Pit No:	TP3	Test No:	1	Date:	15.01.20
Length (m):	2.550	Datum Height:	0.00 m agl		
Width (m):	0.66	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.300	240	0.350
1	0.300		
2	0.300		
3	0.300		
4	0.300		
5	0.300		
10	0.300		
15	0.300		
25	0.300		
35	0.330		
60	0.350		
90	0.350		
120	0.350		
180	0.350		



Start water depth for analysis (mbgl)	0.30		
75%effective depth (mbgl):	0.63	Elapsed time (mins):	#N/ A
50%effective depth (mbgl):	0.95		
25%effective depth (mbgl):	1.28	Elapsed time (mins):	#N/ A
Base of soakage zone (mbgl):	1.60		
Volume outflow between 75%and 25%effective depth (m³):			
Mean surface area of outflow (m²):			5.86
(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.
Remarks Results processed following BRE 365 (2007).	

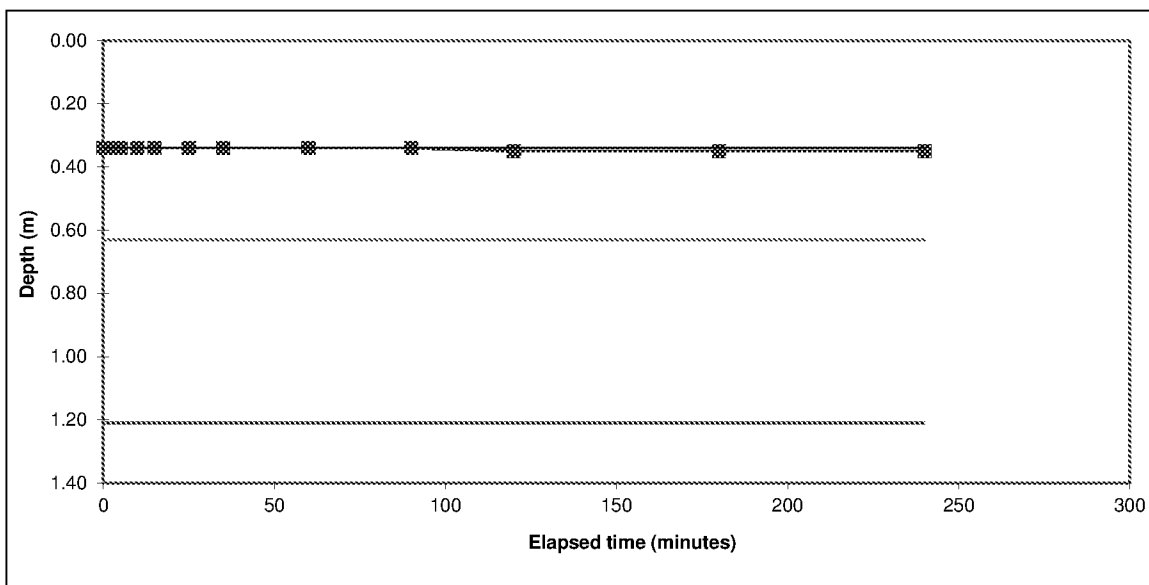
Client:	GD Group	TP3
Site:	Arundel Road	

Your Environment

Soakaway Test

Trial Pit No:	TP4	Test No:	1	Date:	15.01.20
Length (m):	3.000	Datum Height:		0.00 m agl	
Width (m):	0.60	Granular infill:	None		
Depth (m):	0.90	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.340	240	0.350
1	0.340		
2	0.340		
3	0.340		
4	0.340		
5	0.340		
10	0.340		
15	0.340		
25	0.340		
35	0.340		
60	0.340		
90	0.340		
120	0.350		
180	0.350		



Start water depth for analysis (mbgl)	0.34		
75%effective depth (mbgl):	0.63	Elapsed time (mins):	#N/ A
50%effective depth (mbgl):	0.92		
25%effective depth (mbgl):	1.21	Elapsed time (mins):	#N/ A
Base of soakage zone (mbgl):	1.50		
Volume outflow between 75%and 25%effective depth (m³):			
Mean surface area of outflow (m²):		5.98	
(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.	
Remarks Results processed following BRE 365 (2007).			

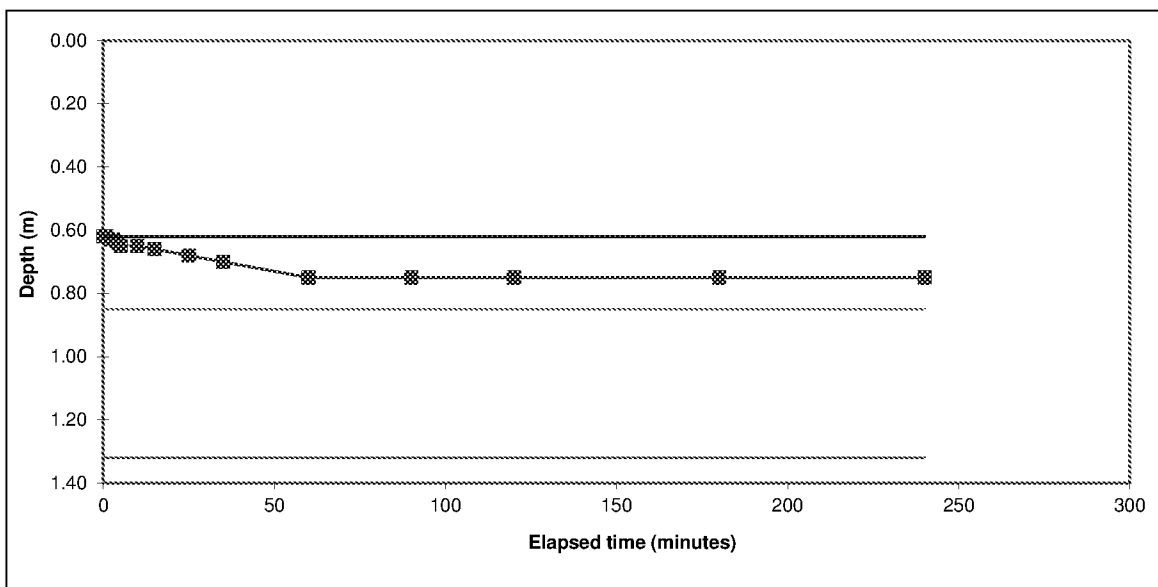
Client:	GD Group	TP4
Site:	Arundel Road	

Your Environment

Soakaway Test

Trial Pit No:	TP5	Test No:	1	Date:	15.01.20
Length (m):	2.500	Datum Height:	0.00 m agl		
Width (m):	0.60	Granular infill:	None		
Depth (m):	1.55	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.620	240	0.750
1	0.620		
2	0.630		
3	0.630		
4	0.640		
5	0.650		
10	0.650		
15	0.660		
25	0.680		
35	0.700		
60	0.750		
90	0.750		
120	0.750		
180	0.750		



Start water depth for analysis (mbgl)	0.62		
75%effective depth (mbgl):	0.85	Elapsed time (mins):	#N/ A
50%effective depth (mbgl):	1.09		
25%effective depth (mbgl):	1.32	Elapsed time (mins):	#N/ A
Base of soakage zone (mbgl):	1.55		
Volume outflow between 75%and 25%effective depth (m³):			
Mean surface area of outflow (m²):		4.35	
(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.
Remarks Results processed following BRE 365 (2007).	

Client:	GD Group	TP5
Site:	Arundel Road	

APPENDIX D: Photographs



Site: Arundel Road

Client: GD Group

Job Reference: YE7990, Dated: January 2020

A.



B.



C.



D.



Your Environment

A. TP01

B. TP02

C. TP03

D. TP04



ABON DISTRICT COUNCIL A/2520/DOO
Your Environment

Site: Arundel Road

Client: GD Group

Job Reference: YE7990, Dated: January 2020

E



Your Environment

E. TP05



ABON DISTRICT COUNCIL A/2520/DOO
Your Environment