

SOAKAGE TESTING AND GROUNDWATER MONITORING

AT

FIELD PLACE, NYTON ROAD, ALDINGBOURNE

FOR

MR & MRS MARTIN

G6443

18 March 2021



Ground Management Ltd
Civil and Geotechnical Engineering Services

DOCUMENT CONTROL

Report Title: Soakage Testing and Groundwater Monitoring
Field Place, Nyton Road, Aldingbourne

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Distribution: Mr & Mrs Martin PDF copy 18 March 2021
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Signed:

Ground Management Ltd Robin Hill Farm Clay Lane Fishbourne Chichester West Sussex PO18 8AB



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Exploratory Hole Logs: Borehole BH1
 Trial Pit TP1

Infiltration Test Results

1.0 INTRODUCTION

- 1.1 Ground Management Ltd have provided support with preliminary ground investigation at Field Place, Nyton Road, Aldingbourne, to collect information on ground conditions relevant to drainage of proposed extension of an existing house.
- 1.2 The work included a brief desk study, site visit for borehole excavation and standpipe installation together with large scale soakage testing within a trial pit previously excavated by the Client.
- 1.3 The exploratory holes allowed assessment of ground conditions and collection of samples. The standpipe will enable ongoing monitoring of groundwater level.
- 1.4 This report provides a record of the investigation and its findings together with brief discussion and recommendations to assist drainage design.
- 1.5 Recommendations are based on the conditions revealed by the investigation. Should the proposed development change or ground conditions be found to vary from those previously revealed they should be reported to a geotechnical engineer to consider the significance.
- 1.6 A contamination assessment has not been requested or carried out.
- 1.7 The work was carried out on behalf of Mr & Mrs Martin and nothing in this report confers or purports to confer on any third party, any benefit or any right to enforce any term of this report pursuant to the Contract (Rights of Third Parties) Act 1999.

2.0 PROPOSED DEVELOPMENT

- 2.1 The proposed development is currently being designed and is expected to comprise an extension on the southwest side of the existing house as indicated on an aerial photograph annotated by the Client, which is presented on the attached Figure 3.
- 2.2 The work will include removal of an existing garage.

3.0 GENERAL DESCRIPTION OF SITE AND SURROUNDING AREA

- 3.1 The site is located on the north side of Nyton Road as indicated on Figure 1. The National Grid Reference for the site is SU 92942 05819 approximately and the nearest postcode is PO20 3UA.
- 3.2 The site comprises a semi detached house, together with double garage, garden and driveway areas as indicated on the attached Figure 2.
- 3.3 The existing driveway comprises a mix of concrete, block paving, and gravel surfacing. There are no available details for the existing surface water drainage but it is believed that some areas run to soakaways while others run off to adjacent soft landscape areas.
- 3.4 The site is raised slightly above the Nyton Road and ground levels across the surrounding area generally slope a little towards the south and south west. Ground levels have not been surveyed but the 1:25,000 Ordnance Survey mapping shows the site between the 10m and 15m contours and indicates an average slope of about 1:100.
- 3.5 There are no watercourses in the vicinity of the site.
- 3.6 Underground service plans were not available however the Client advised there were no services beneath the area of the proposed investigation.

4.0 GEOLOGY

- 4.1 The 1:50,000 British Geological Survey of England and Wales Sheet 317/332, “Chichester and Bognor” dated 1996 indicates the site to be underlain by a thin band of Dry Valley Head Deposits (noted as chalky and flinty and distributed along a line that runs south from the Downs) above London Clay. Head Gravel, comprising clayey gravels, is shown extensively across the surrounding area and some areas of Aeolian Deposit (Brickearth).
- 4.2 Interpretation of the mapping suggests the mapped strata may be intervened by Raised Beach Deposits, comprising sands and gravels.
- 4.3 The solid geology is indicated to have a southerly dip towards the east – west Chichester Syncline approximately 2km to the south
- 4.4 A report prepared by the Institute of Geological Sciences, titled Mineral Assessment Report 138 “Sand and Gravel Resources SU80, 90 Chichester and Bognor Regis, Sussex” includes an exploratory hole referenced 90 NW 68, Aldingbourne Church, located 500m south west of the site and recording :

Head Gravel	0m to 1.5m
Raised Beach Deposits	to 2.9m
London Clay Formation	to > 4.1m

5.0 DETAILS OF THE GROUND INVESTIGATION

- 5.1 The ground investigation fieldwork comprised the exploratory holes indicated on Figure 4 and described below. The scope and location were selected to target the possible soakaway position within an open area in the rear garden.
- 5.2 The work commenced with the machine excavation of the trial pit TP1 to a depth of 1.2m by the Client on 14 March 2021. This was followed on 16 March 2021 with excavation of BH1 to 3.0m and large scale soakage testing within TP1 by Ground Management Ltd.
- 5.3 The holes allowed the ground profile to be examined and recorded and a 19mm diameter standpipe was installed within the completed borehole for monitoring of groundwater level.
- 5.4 The large scale soakage test in TP1 was carried out in accordance with BRE 365 including 3 refills of the test pit. Results of the tests are appended.
- 5.5 The exploratory holes were logged in general accordance with BS5930:1999 Code of Practice for Site Investigation. The sampling referencing and the results of the insitu testing are presented on the appended logs.
- 5.6 Selected samples were taken from the exploratory holes to be available should laboratory testing be required.

6.0 GROUND AND GROUNDWATER CONDITIONS

- 6.1 Descriptions of the soils encountered are presented on the attached exploratory hole logs. The findings can be summarised as follows:

Strata	Thickness (m)	Depth to base of strata (m bgl)
MADE GROUND / TOPSOIL	0.2 – 0.3	0.2 – 0.3
Silty CLAY with flint gravel	0.6 – 0.8	0.8 – 1.1
Silty GRAVEL, locally chalky	>0.4 -1.7	> 1.2 – 2.8
Slightly clayey silty fine SAND	>0.2	>3.0

- 6.2 Groundwater was observed during excavation of the borehole as moderate inflow following removal of the second sample tube (from 2m). The water level was recorded at 1.31m bgl after 30 minutes. Ongoing monitoring will assist interpretation.
- 6.3 An assessment of the large scale soakage test results are appended and a summary is presented in the table below:

Trial Pit	Pit Dimensions LxWxD (metres)	Test No.	Water Level at start of test (mm below ground level)	Duration of test (mins)	Fall of water level during test (mm)	Infiltration Coefficient (m/s)
TP1	0.3 x 1.0 x 1.2	1	210	9	790	4.5×10^{-4}
		2	130	7	870	4.1×10^{-4}
		3	120	6	860	5.2×10^{-4}

7.0 DISCUSSION AND RECOMMENDATIONS

7.1 Ground and groundwater conditions

7.1.1 Ground conditions revealed by this investigation generally confirm the anticipated geology of Head Gravel and Dry Valley Head Deposits with possible Raised Beach Deposits encountered at the base of BH1. The exploratory holes were of insufficient depth to encounter the underlying London Clay Formation.

7.1.2 Highest groundwater level was recorded at 1.31m bgl on 16/3/21.

7.1.3 It should be assumed that there will be seasonal variation of the groundwater level and it should be expected to rise in response to rain. The installed standpipe will allow ongoing monitoring of the groundwater levels to investigate these effects.

7.2 Excavations

7.2.1 Shallow excavations above the water table have a reasonable prospect of the sides standing vertically in the short term but where expected to remain open for any length of time or if greater than 1.2m deep and are to be entered by personnel will need support.

7.2.2 Deeper excavations extending below the groundwater within the gravel strata may not be required but if they are necessary may be unstable and rapid inflow of groundwater could be problematic and require specialist dewatering techniques.

7.3 Drainage

7.3.1 Based on the results of the soakage tests an infiltration coefficient of 4.0×10^{-4} m/s may be adopted for the design of a shallow soakaway extending into the gravel stratum at the location of TP1.

7.3.2 Confirmatory tests should be conducted if soakaways are to be located in differing ground conditions elsewhere on the site.

7.4 **Underground Services**

- 7.4.1 It is recommended that utility maps and all available information on the location of underground services should be referenced prior to further excavation of the site.
- 7.4.2 Any redundant drainage pipework and chambers should be removed or properly filled / grouted. Any soakaways serving the existing surface water and roof drains should be located to establish if they will impact on the foundation design.
- 7.4.3 Should land drains be encountered during excavation and construction they should be diverted around the works to allow continued performance.

Ground Management Ltd

Civil and Geotechnical Engineering Services

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Phone/Fax 01243 575073

PROJECT NO: G6443

FIGURE REF: Figure 1

PROJECT: Field Place, Nyton Road, Aldingbourne

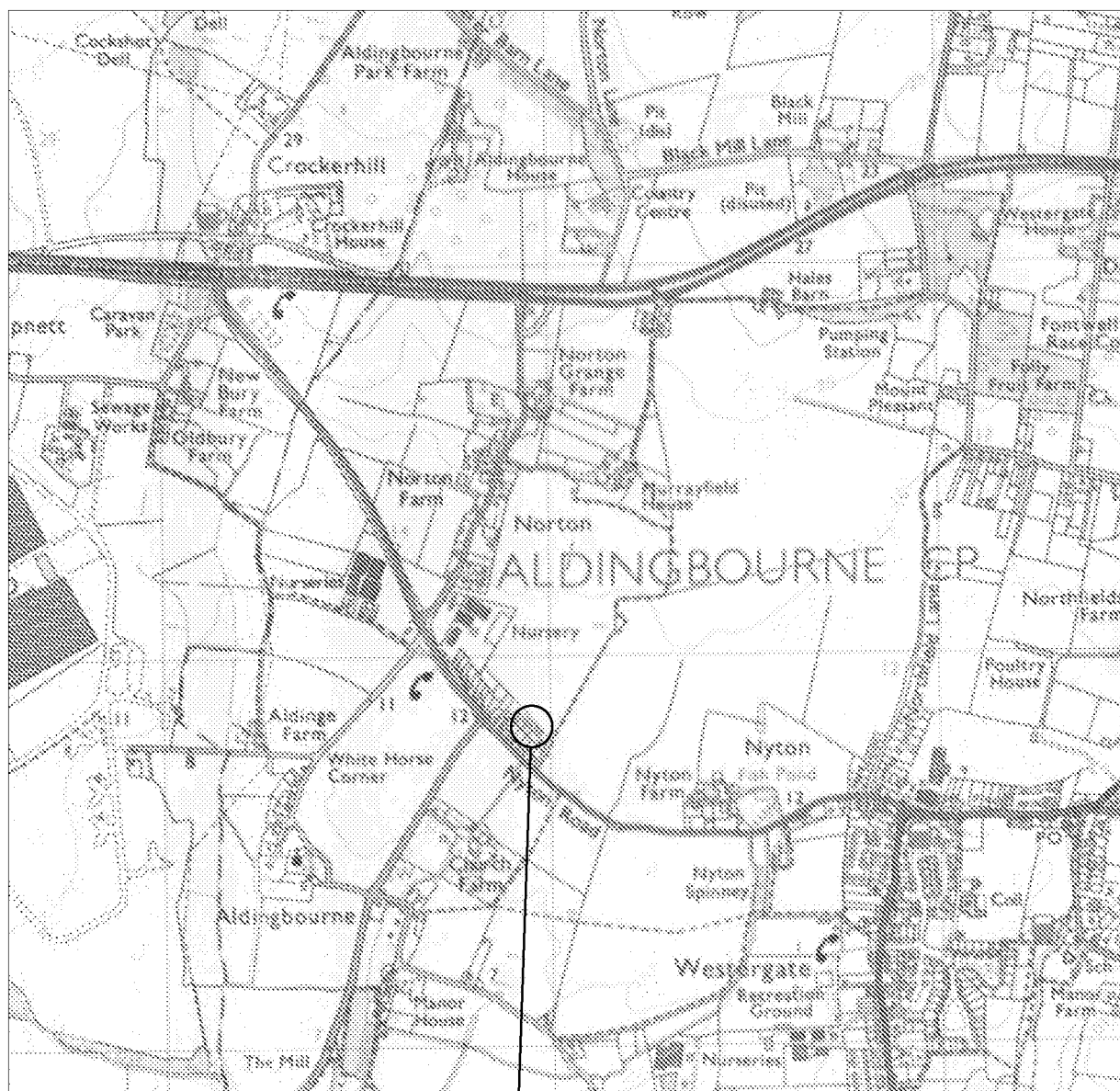
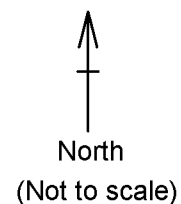
PREPARED: AJHT

SECTION: Preliminary Ground Investigation

CHECKED: AJHT

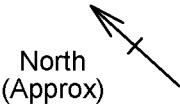
TITLE: Site Location Plan

DATE: March 2021



Site Location

Ground Management Ltd Civil and Geotechnical Engineering Services		PROJECT NO: G6443
		FIGURE REF: Figure 2
PROJECT:	Field Place, Nyton Road, Aldingbourne	PREPARED: AJHT
SECTION:	Preliminary Ground Investigation	CHECKED: AJHT
TITLE:	Existing Site Layout	DATE: March 2021



Ground Management Ltd Civil and Geotechnical Engineering Services	Robin Hill Farm, Clay Lane, Fishbourne CHICHESTER, West Sussex PO18 8AB Phone/Fax: 01243 575073	PROJECT NO: G6443
		FIGURE REF: Figure 3
PROJECT: Field Place, Nyton Road, Aldingbourne	PREPARED: AJHT	
SECTION: Preliminary Ground Investigation	CHECKED: AJHT	
TITLE: Proposed Development	DATE: March 2021	

North
(Approx)



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CHICHESTER, West Sussex PO18 8AB

PROJECT NO: G6443

FIGURE REF: Figure 4

PROJECT: Field Place, Nyton Road, Aldingbourne

PREPARED: AJHT

SECTION: Preliminary Ground Investigation

CHECKED: AJHT

TITLE: Exploratory Hole Location Plan

DATE: March 2021

(HOLE LOCATIONS ARE INDICATIVE ONLY UNLESS DIMENSIONED)

FIELD

North
(Approx)

ACCESS ROAD

WORKSHOP

DRIVEWAY

PROPOSED
EXTENSION
(SHOWN DASHED)

HOUSE

GARAGE

GARDEN

TP1



BH1

Ground Management Ltd

Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
CHICHESTER West Sussex PO18 8AB

Site

Field Place, Nyton Road, Aldingbourne PO20 3UA

Number
BH1

Excavation Method Hand held window sampling	Dimensions 80mm to 1.10m 60mm to 2.00m 50mm to 3.00m	Ground Level (mOD)	Client Mr & Mrs Martin	Job Number G6443
	Location See Location Plan	Dates 16/03/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40-0.90	D1				(0.30)	MADE GROUND of moist dark brown slightly sandy slightly clayey silt (Topsoil) with some coarse medium and fine subangular flint gravel and occasional fine to medium charcoal and chalk		
					0.30	Firm brown becoming orange brown slightly sandy silty CLAY with much coarse medium and fine subangular flint gravel and occasional flint cobble.		
1.10-2.50	D2				(0.80)	... increasing gravel content below 0.7m		
					1.10	Wet grey brown slightly silty well graded coarse medium and fine angular to subangular flint GRAVEL		
2.50-2.80	D3				(1.70)	... with a little clayey silt and some fine and medium chalk gravel below 2.5m		
2.80-3.00	D4				2.80	Firm yellow brown slightly clayey silty fine SAND		
					(0.20) 3.00	Complete at 3.00m		

Remarks

Some side collapse below 2.0m
Moderate groundwater inflow after extraction of second sample tube (to 2m)
19mm dia standpipe installed to 3.0m bgl. Water level at 1.31m bgl after 30 minutes.

Scale (approx)

1:20

Logged By

AT

Figure No.

G6443.BH1

Ground Management Ltd

Civil and Geotechnical Engineering Services

Robin Hill Farm, Clay Lane, Fishbourne

CH

Site

ce, Nyton Road, Aldingbourne PO20 3UA

**Trial Pit
Number
TP1**

Excavation Method Machine excavated (Pre-dug by Client)	Dimensions 0.3m x 1.1m	Ground Level (mOD)	Client Mr & Mrs Martin	Job Number G6443
	Location See Location Plan	Dates 16/03/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.20	MADE GROUND of moist dark brown slightly sandy slightly clayey silt (Topsoil) with some coarse medium and fine subangular flint gravel. .. locally some medium chalk gravel		
					0.60	Firm orange brown slightly sandy silty CLAY with much coarse medium and fine subangular flint gravel ... increasing gravel towards base of stratum		
					0.80	Cream well graded coarse medium and fine subangular flint GRAVEL with much chalky silt and fine to medium gravel size chalk		
					1.20	Complete at 1.20m		

Plan 	Remarks		
	Pit sides remaining stable and vertical Pit was excavated previous day and remained dry Soakage test carried out within pit		
	Scale (approx)	Logged By	Figure No.
	1:25	AT	G6443.TP1

G6443 Field Place, Nyton Road
Soakage Test

TP1 Test 1

Test Start Date: 16-Mar-21

Dimensions (m):

width = 0.30

length = 1.00

depth = 1.20

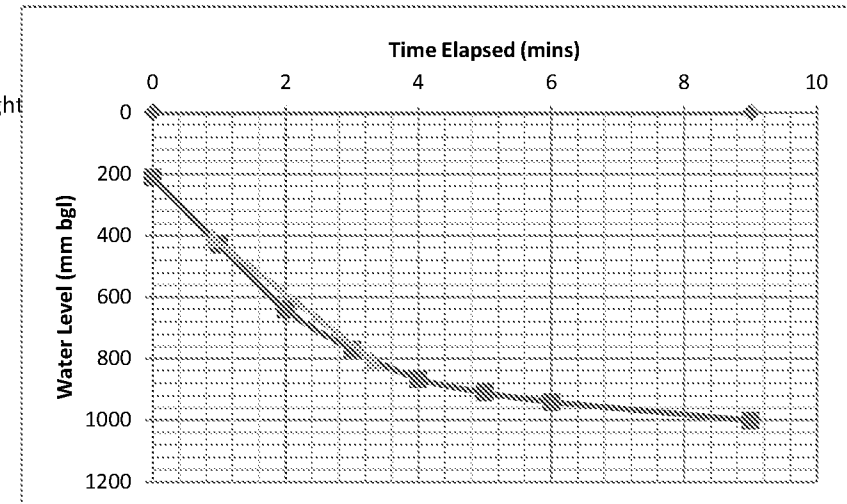
Note: Test dips from datum 200mm bgl

[illegible]

End Fit

Weather

0 Dry & Bright



0

	Time (mins)	
t0	210	
t25	407.5	0.9
t50	605	
t75	802.5	3.3
t100	1000	
fall		0.79
t25 - t75		0.395
Area t50		1.847

Infiltration Coefficient = 0.000446 m/s

G6443 Field Place, Nyton Road
Soakage Test

TP1 Test 2

Test Start Date: 16-Mar-21

Dimensions (m):

width = 0.30

length = 1.00

depth = 1.20

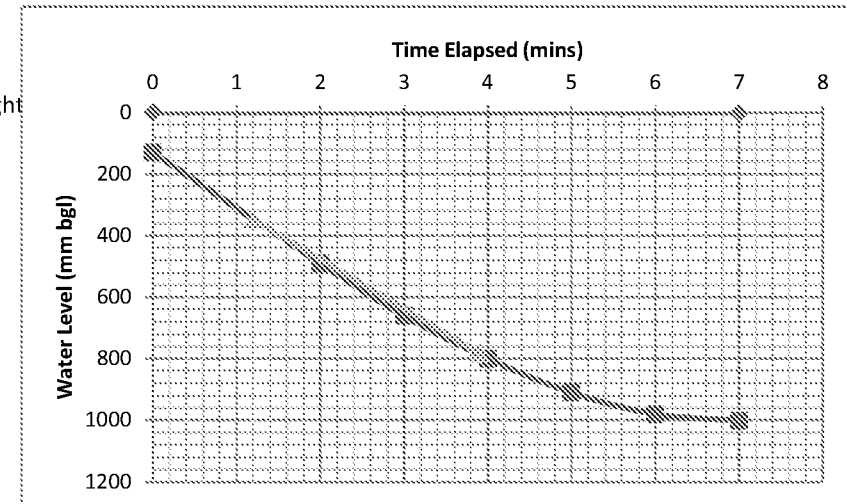
Note: Test dips from datum 200mm bgl

[illegible]

End Fit

Weather

0 Dry & Bright



0

	Time (mins)	
t0	130	
t25	347.5	1.2
t50	565	
t75	782.5	3.9
t100	1000	
fall		0.87
t25 - t75		0.435
Area t50		1.951

Infiltration Coefficient = 0.000413 m/s

G6443 Field Place, Nyton Road
Soakage Test

TP1 Test 3

Test Start Date: 16-Mar-21

Dimensions (m):

width = 0.30

length = 1.00

depth = 1.20

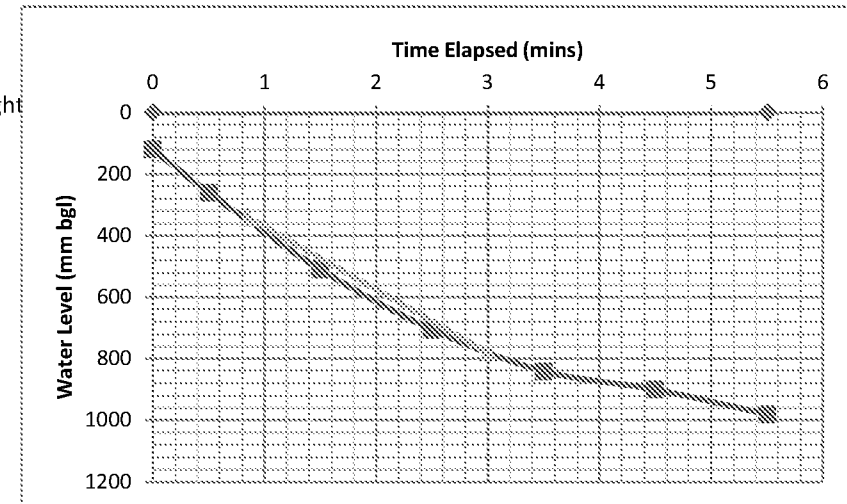
Note: Test dips from datum 200mm bgl

[illegible]

End Fit

Weather

0 Dry & Bright



0

	Time (mins)	
t0	120	
t25	340	0.85
t50	560	
t75	780	3
t100	1000	
fall		0.88
t25 - t75		0.44
Area t50		1.964

Infiltration Coefficient = 0.000521 m/s