

GROUND WATER MONITORING AND SUPPLEMENTARY TESTING

AT

WANDLEYS FARM, WANDLEYS LANE, FONTWELL

FOR

MR & MRS K LILLYWHITE

G6386

30 March 2020



Ground Management Ltd
Civil and Geotechnical Engineering Services

DOCUMENT CONTROL

Report Title: Groundwater Monitoring and Supplementary Testing
Wandleys Farm, Wandleys Lane, Fontwell

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Sloane and Brown Architectural
Services

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Soakage Test Results

Groundwater Monitoring

1.0 INTRODUCTION

- 1.1 Ground Management Ltd have carried out groundwater monitoring and undertaken further soakage testing at Wandleys Farm, Wandleys Lane, Fontwell, to collect information to supplement previous ground investigation relating to the drainage of a proposed residential development.
- 1.2 The work comprised monitoring of 3 standpipes installed within boreholes during the earlier investigation and the hand excavation of three shallow pits to provide an assessment of the near surface permeability.
- 1.3 This report provides a record to assist with drainage design and should be read in conjunction with the Preliminary Ground Investigation Report dated 2nd September 2019.
- 1.4 The work was carried out on behalf of Mr and Mrs Lillywhite 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 DETAILS OF THE INVESTIGATION

- 2.1 Winter groundwater monitoring was carried out between 4 October 2019 and 17 March 2020 in the three standpipes installed during the preliminary investigation. The standpipes referenced as BH1 to BH3 were located are indicated on Figure 4.
- 2.2 To supplement the soakage testing carried out during the preliminary ground investigation and provide an indication of the permeability of the near surface soils, four shallow trial pits, referenced as TP101 to TP104, were excavated by hand at the locations indicated on Figure 5. Small scale soakage tests were carried out in the pits.

3.0 GROUND AND GROUNDWATER CONDITIONS

- 3.1 During monitoring the groundwater was observed between 0.05m and 1.74m below ground level. A copy of the observations are appended.
- 3.2 Generally, groundwater was observed closer to ground surface in BH1 located towards the north of the site and at greater depth in BH3 located on lower ground closer to the southern boundary.
- 3.3 Groundwater levels were noted to be high in all boreholes during a monitoring visit on 20/12/19 that was carried out immediately after a night of very heavy rain and followed a prolonged period of significantly higher than average rainfall. The subsequent observed peak in groundwater level during a period of high rainfall at the end of February 2020 was monitored more closely to observe the rate that the groundwater level recovered.
- 3.4 A description of the soils encountered during the previous investigation was presented within the Preliminary Ground Investigation Report and summarised as follows:

Strata	Thickness (m)	Depth to base of strata (m bgl)
TOPSOIL	0.2 – 0.4	0.2 – 0.4
Clayey GRAVEL and gravelly CLAY / SILT	0.25 – 1.35	0.5 – 1.75
Silty fine to medium SAND (not encountered TP2 or TP3 and absent BH3)	>0.1– 1.3	>0.9 – 2.4
Laminated silty SAND and very sandy CLAY / SILT with clay bands (BHs only)	0.75 - >0.9	2.5 - >3.0
Stiff mottled CLAY (BH3 only)	>0.5	> 3.0

- 3.5 Trial pits TP101 to TP104 extended to between 0.45 and 0.55m deep and encountered 0.15 to 0.2m of topsoil above silty CLAY with variable gravel content.
- 3.6 The small scale soakage test observations for TP101 to TP104 are appended together with an assessment of the infiltration coefficients that ranged from 2.7×10^{-6} to 3.9×10^{-6} m/s.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Ground and groundwater conditions

4.1.1 Ground conditions revealed by this investigation generally confirm the anticipated geology of Head Gravels over Raised Beach Deposits above the Reading Formation (Lambeth Group). The near surface strata comprise a mix of clayey gravels and gravelly clays underlain by silty sand.

4.1.2 Seasonal variation of the groundwater level has been observed and groundwater was noted to come close to ground level.

4.2 Drainage

4.2.1 The results of the soakage tests carried out during the preliminary ground investigation revealed a significant variation in permeability with derived infiltration coefficients ranging from 3.8×10^{-7} m/s in TP1A to 1.9×10^{-5} m/s in TP3.

4.2.2 The small scale shallow soakage tests within TP101 to TP104 recorded infiltration coefficients between 2.7×10^{-6} and 3.9×10^{-6} m/s.

4.2.3 The performance of even shallow soakaways on this site will be restricted by the potential for high groundwater and it is anticipated that the design of drainage will have to consider also discharge of attenuated flow to the adjacent watercourse. Consideration will need to be given to options for storage to enable flows to be attenuated. This may include open surface features landscaped into the space available at the south of the site.

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FIGURE REF: Figure 1

PROJECT: Wandleys Farm, Wandleys Lane, Fontwell

PREPARED: AJHT

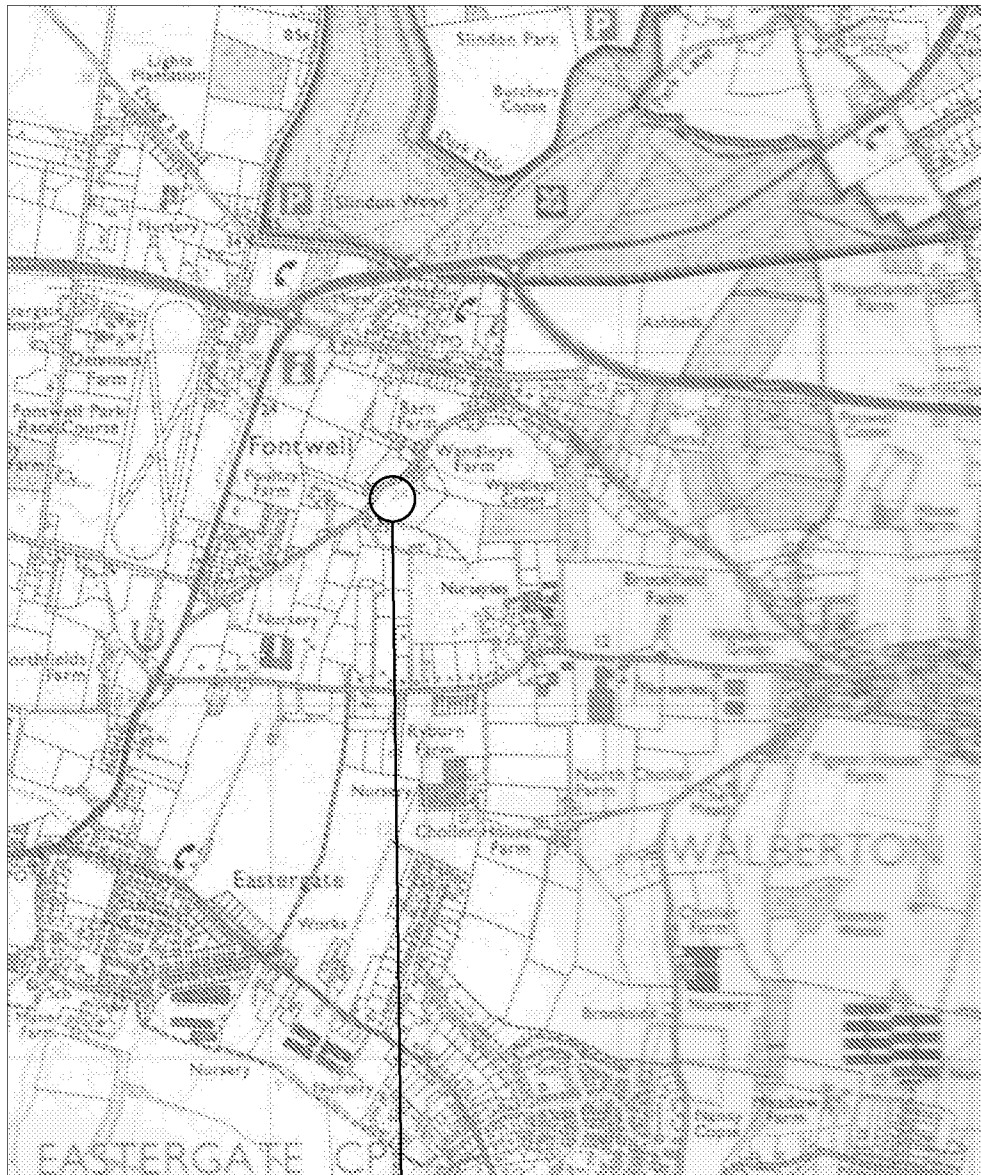
SECTION: Preliminary Ground Investigation

CHECKED: AJHT

TITLE: Site Location Plan

DATE: Jul 2019

↑
North
(Not to scale)



Site Location

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FIGURE REF: Figure 2

PROJECT: Wandleys Farm, Wandleys Lane, Fontwell

PREPARED: AJHT

SECTION: Preliminary Ground Investigation

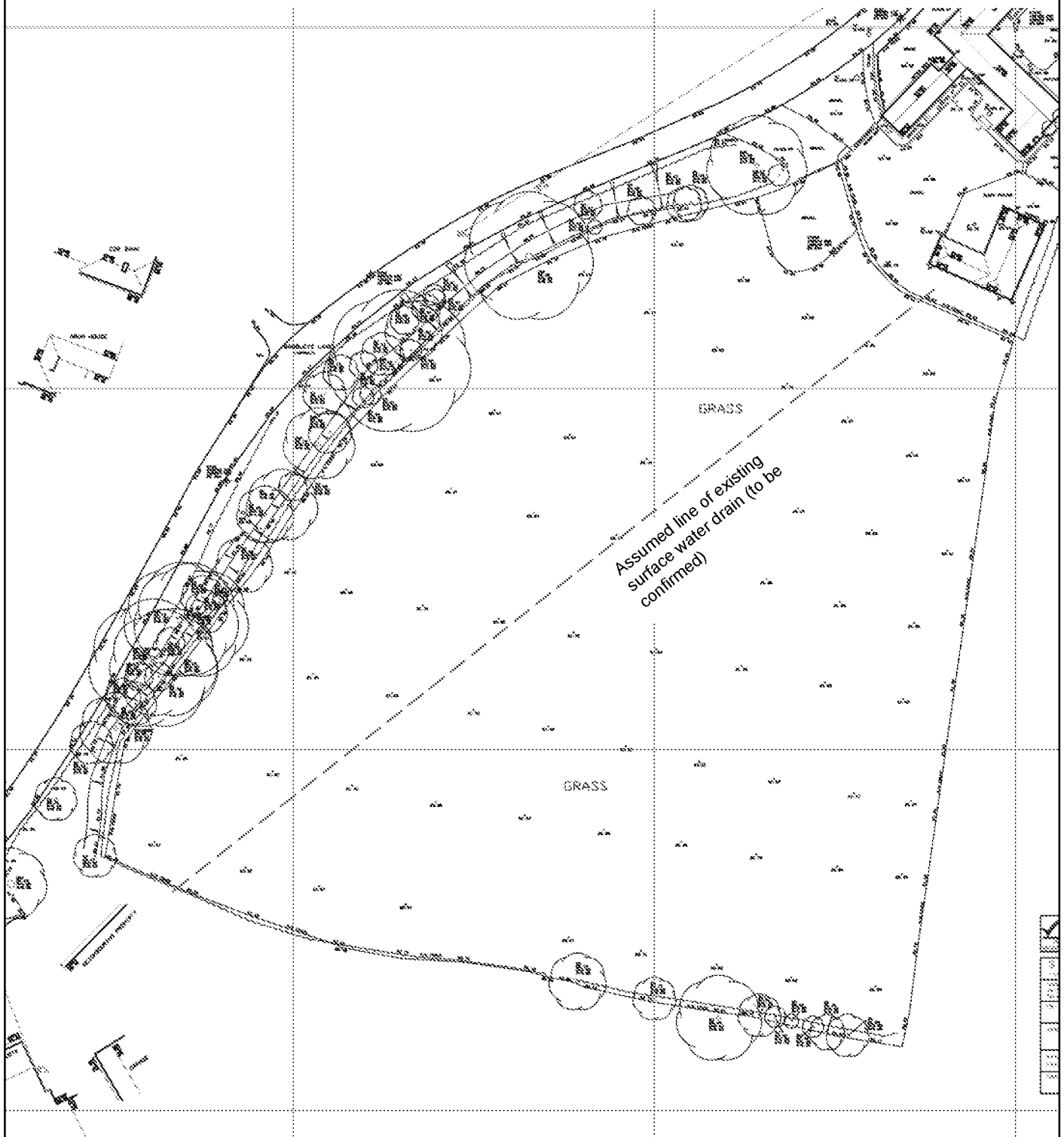
CHECKED: AJHT

TITLE: Existing Site Layout

DATE: Jul 2019

North
(Approx)

Not to scale



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FIGURE REF: **Figure 3**

PROJECT: **Wandleys Farm, Wandleys Lane, Fontwell**

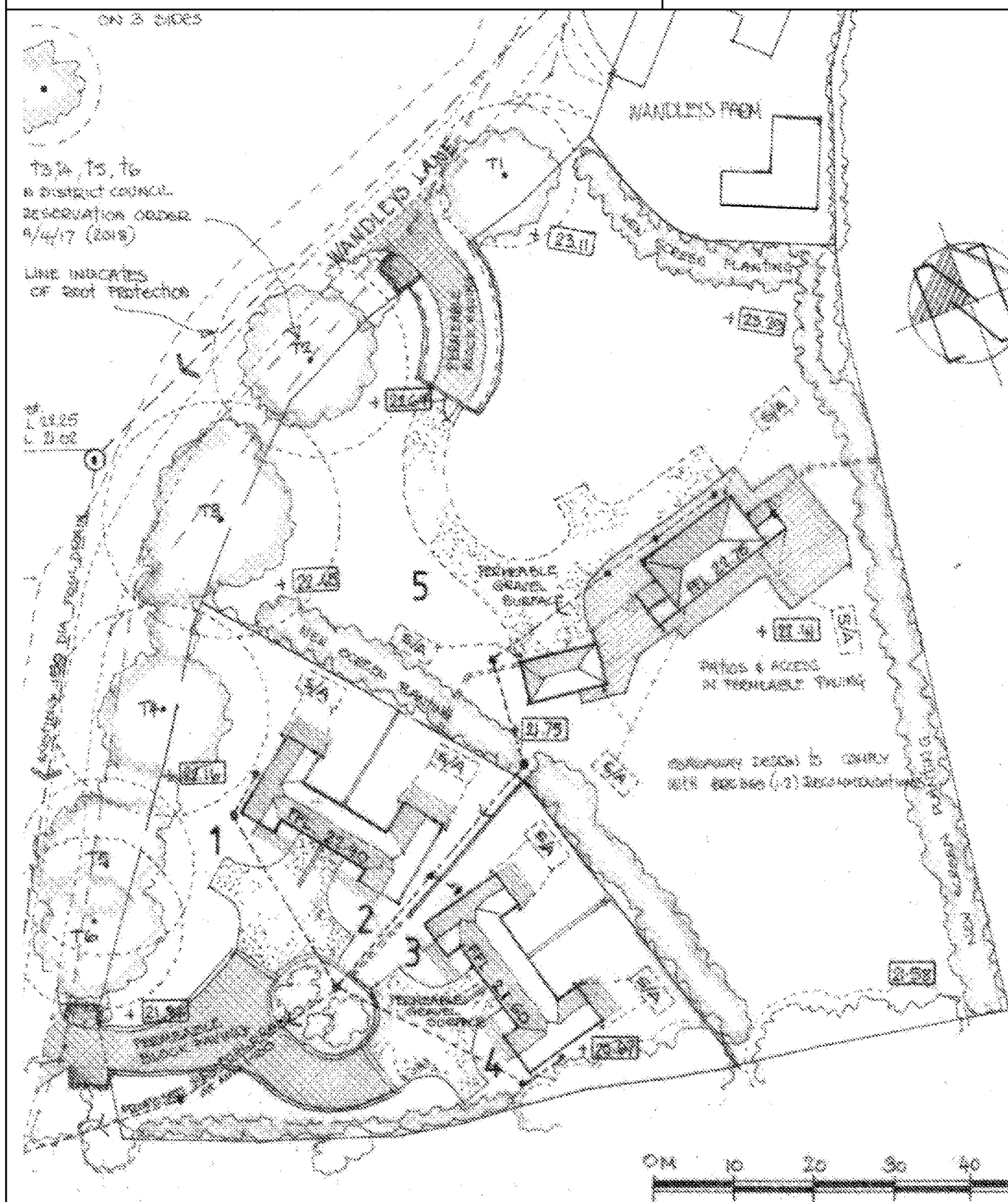
PREPARED: AJHT

SECTION: Preliminary Ground Investigation

CHECKED: AJHT

TITLE: Proposed Development

DATE: Jul 2019



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PROJECT NO: G6386

FIGURE REF: Figure 4

PROJECT: Wandleys Farm, Wandleys Lane, Fontwell

PREPARED: AJHT

SECTION: Preliminary Ground Investigation

CHECKED: AJHT

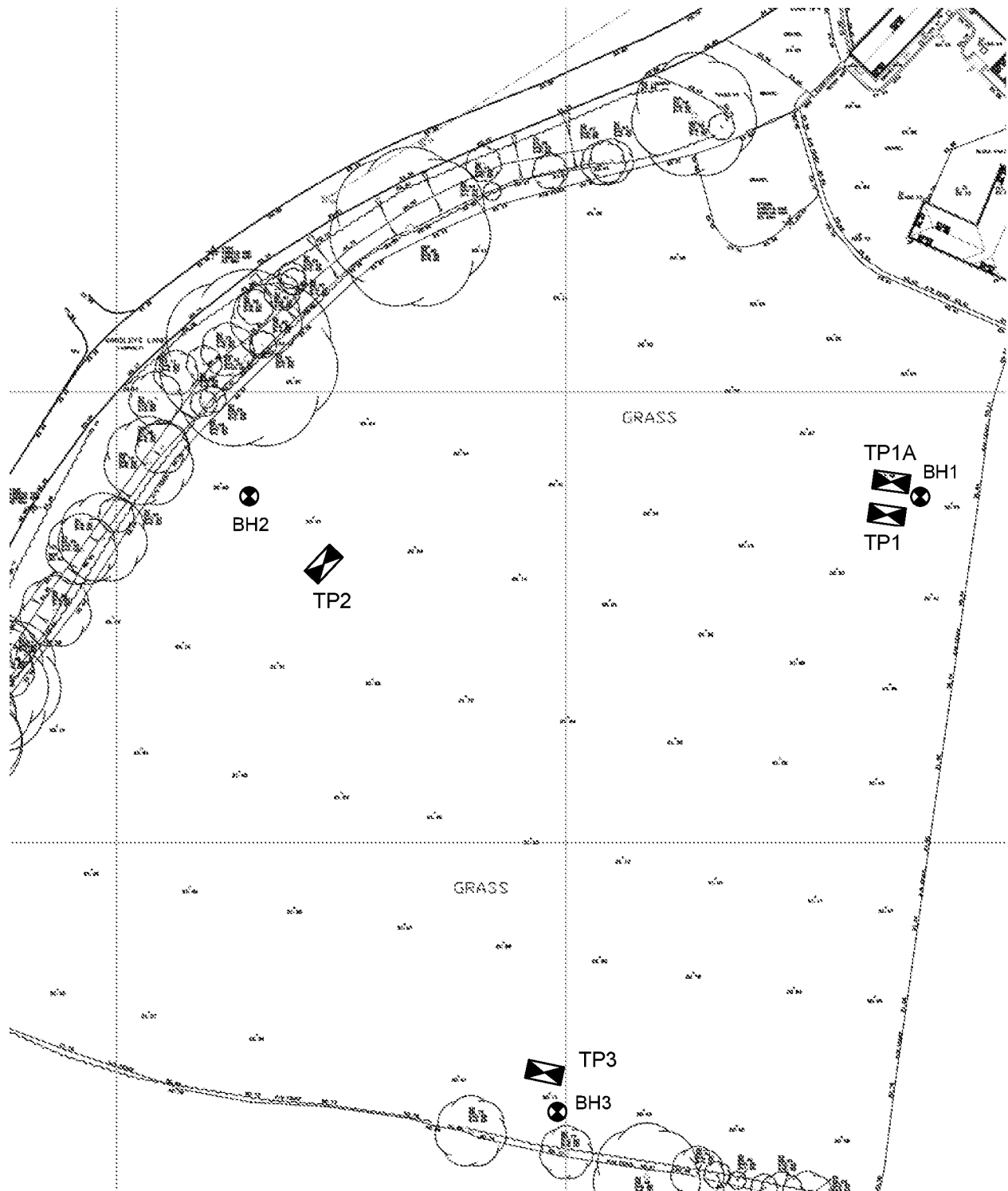
TITLE: Exploratory Hole Location Plan

DATE: Jul 2019

(HOLE LOCATIONS ARE INDICATIVE ONLY UNLESS DIMENSIONED)

North
(Approx)

Not to scale



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PROJECT NO: G6386

FIGURE REF: Figure 5

PROJECT: Wandleys Farm, Wandleys Lane, Fontwell

PREPARED: AJHT

SECTION: Further Ground Investigation

CHECKED: AJHT

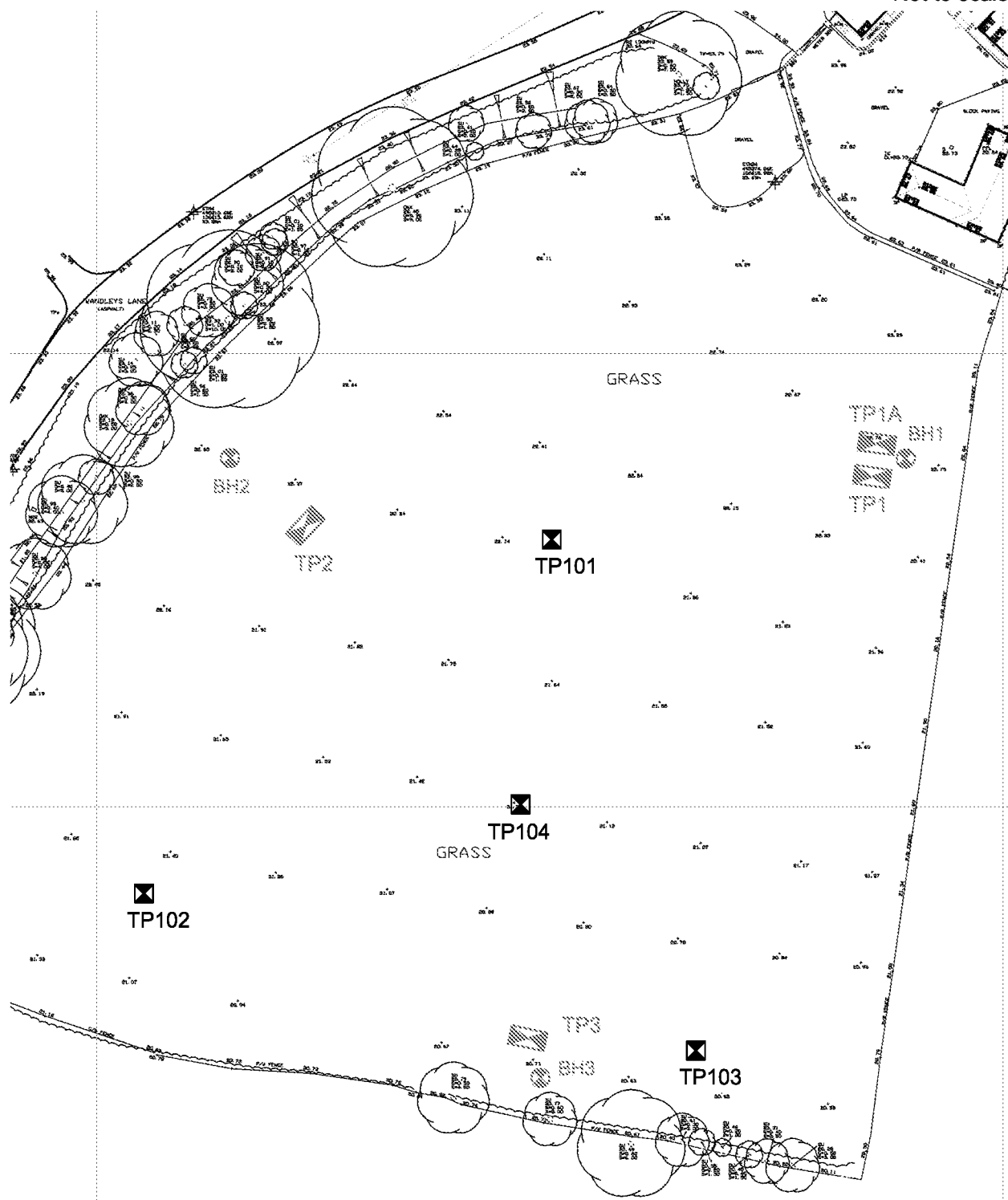
TITLE: Exploratory Hole Location Plan

DATE: March 2020

(HOLE LOCATIONS ARE INDICATIVE ONLY UNLESS DIMENSIONED)

North
(Approx)

Not to scale



Based on topographic survey by Shaw Colegate Oct 2016

Infiltration Coefficient = 3.89E-06 m/s

G6386 Wandleys Farm, Fontwell
Soakage Testing (Second Round)

TP102 Test 1

Test Start Date: 03-Mar-20

Dimensions (m):

width = 0.30

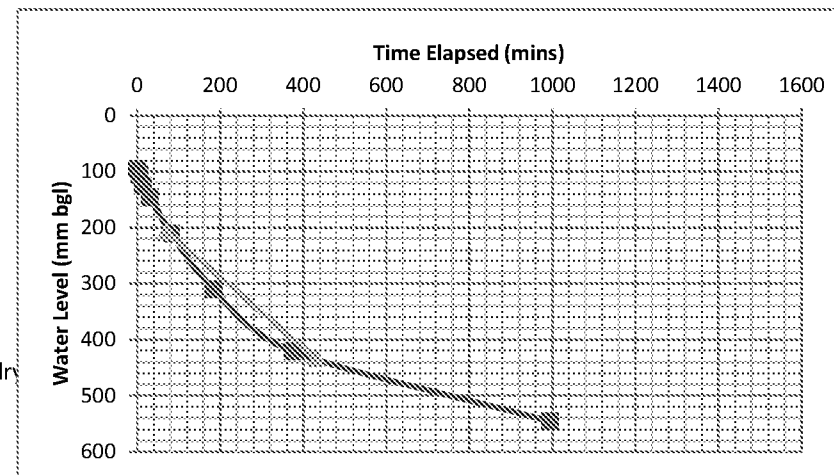
length = 0.30

depth = 0.50

Date	Time	Date and time	Elapsed	Dip
03/03/2020	14:50	03/03/2020 14:50	start	530
03/03/2020	14:56	03/03/2020 14:56	0	95
03/03/2020	15:01	03/03/2020 15:01	5	105
03/03/2020	15:09	03/03/2020 15:09	13	125
03/03/2020	15:27	03/03/2020 15:27	31	145
03/03/2020	16:18	03/03/2020 16:18	82	210
03/03/2020	18:00	03/03/2020 18:00	184	310
03/03/2020	21:10	03/03/2020 21:10	374	420
04/03/2020	07:30	04/03/2020 07:30	994	545
04/03/2020	15:00	04/03/2020 15:00	1444	545

End Fit

hole dry
rain, hole dry



	Time (mins)	
t0	95	
t25	207.5	70
t50	320	
t75	432.5	430
t100	545	
fall		0.45
t25 - t75		0.225
Area t50		0.306

Infiltration Coefficient = 3.06E-06 m/s

G6386 Wandleys Farm, Fontwell
Soakage Testing (Second Round)

TP103 Test 1

Test Start Date: 03-Mar-20

Dimensions (m): width = 0.30 length = 0.30 depth = 0.50

Date	Time	Date and time	Elapsed	Dip
03/03/2020	00:00	06/07/2020 00:00	start	500
03/03/2020	15:01	03/03/2020 15:01	0	115
03/03/2020	15:09	03/03/2020 15:09	8	150
03/03/2020	15:27	03/03/2020 15:27	26	185
03/03/2020	16:18	03/03/2020 16:18	77	245
03/03/2020	18:00	03/03/2020 18:00	179	330
03/03/2020	21:10	03/03/2020 21:10	369	420
04/03/2020	07:30	04/03/2020 07:30	989	510
04/03/2020	15:00	04/03/2020 15:00	1439	510

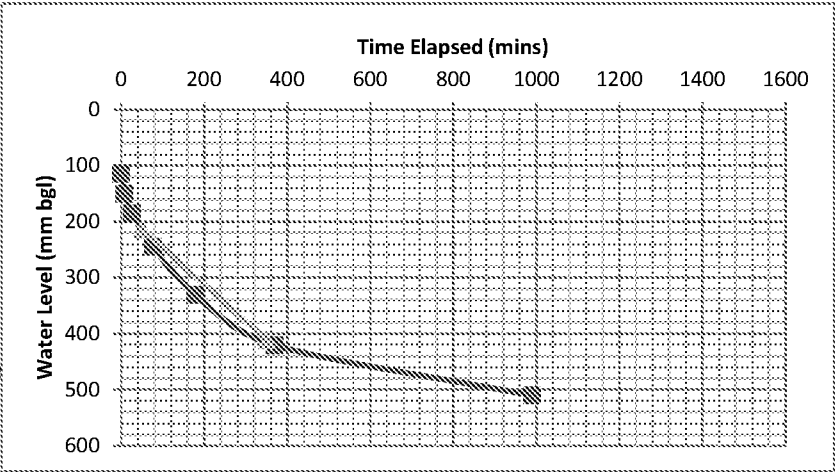
End Fit

pit dry

hole dry

hole dry

rain,hole dry



Time (mins)		
t0	115	
t25	213.75	50
t50	312.5	
t75	411.25	350
t100	510	
fall		0.395
t25 - t75		0.1975
Area t50		0.315

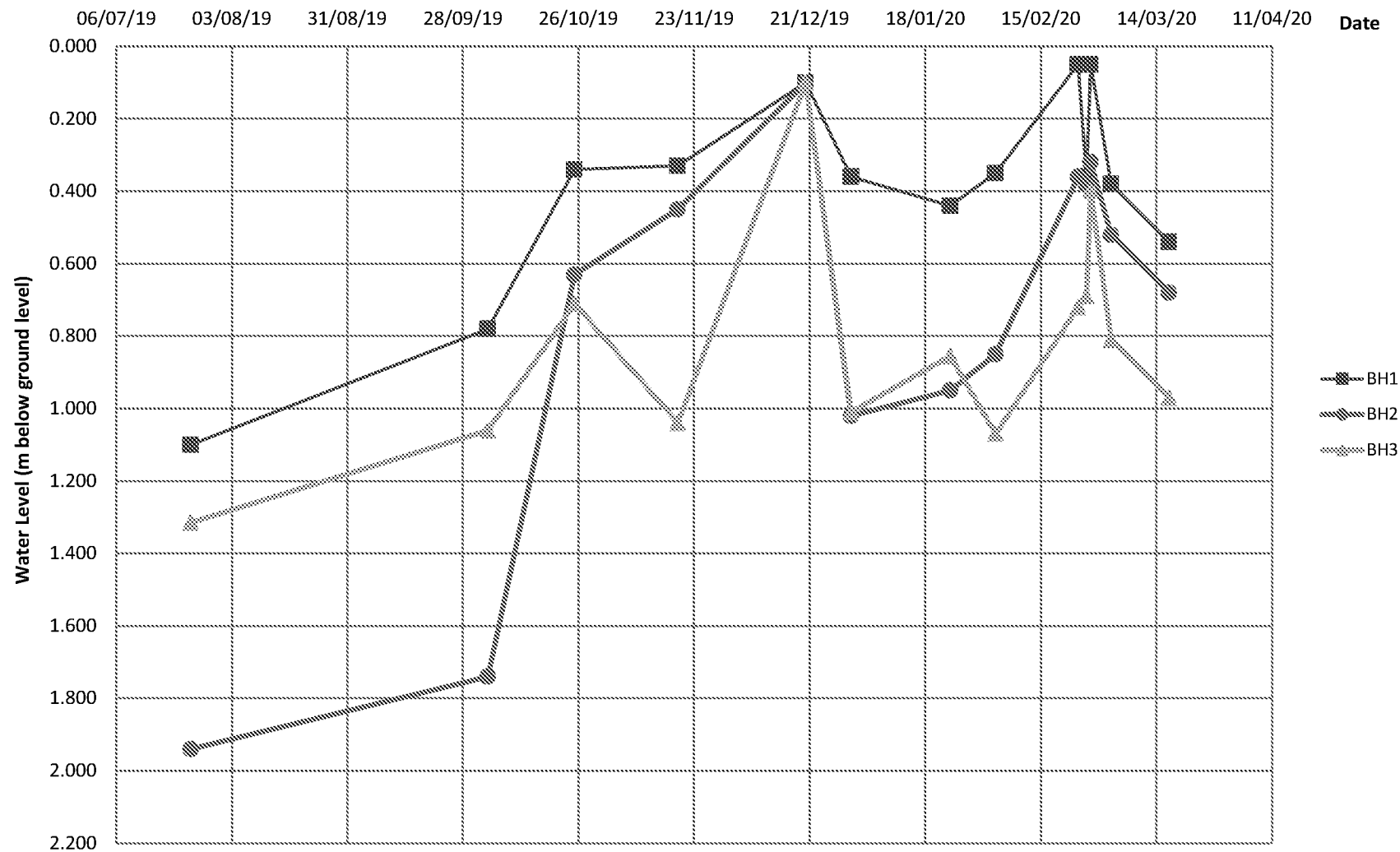
Infiltration Coefficient = 3.13E-06 m/s

		BH1	BH2	BH3			
Upstand (m)		0.000	0.000	0.000			
Ground Level (mAOD)		22.700	22.600	20.700			
Cover level (mAOD)		22.700	22.600	20.700			
Base dip (m)		2.900	2.920	2.800			

mAOD: metres Above Ordnance Datum
(Estimated by reference to the Shaw Colegate Oct 2016 Topographic Survey)

[illegible]

G6386 Wandleys Farm Fontwell Water Level Monitoring



G6386 Wandleys Farm Fontwell Water Level Monitoring

