

GROUNDWATER MONITORING AND SOAKAGE TESTING

AT

GARDENERS ARMS, ARDINGLY

FOR

HALL AND WOODHOUSE

G6719

23 April 2026



Ground Management Ltd
Civil and Geotechnical Engineering Services

DOCUMENT CONTROL

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Gardeners Arms, Ardingly

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PSE Associates

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1.0 INTRODUCTION

- 1.1 Ground Management Ltd have carried out a groundwater monitoring and soakage testing at The Gardeners Arms, Ardingly (location indicated on Figure 1) to inform drainage design for a proposed hotel development.
- 1.2 Proposed exploratory hole locations were indicated by the drainage engineer Simon Dent Associates (SDA) and adjusted to improve accessibility with final locations as indicated on Figure 2.
- 1.3 Two boreholes, referenced as BH1 & BH2 were excavated on 13 January 2026 using a dynamic (windowless) sampling rig. The holes extended to the target depth of 2m and terminated in dense sand / sandstone / siltstone. Further excavation with the dynamic sampling rig was not possible due to the high strength of the ground. A standpipe was installed in each borehole to allow monitoring of groundwater levels.
- 1.4 Based on the initial observations the scope of soakage testing was agreed with the drainage engineer.
- 1.5 Excavation of two trial pits, referenced as TP1 and TP2, was carried out during a return visit on 22 January 2026. The pits each extended to a depth of 1m and were used for soakage testing carried out in accordance with BRE365. Testing continued over subsequent days and was concluded on 29 January 2026 when pits were backfilled with compacted arisings and the car park gravel surface reinstated.
- 1.6 Details of the soils encountered are presented on the appended exploratory hole logs together with soakage test results and groundwater monitoring carried out to date.
- 1.7 Monitoring of the standpipes indicates groundwater to have remained below a depth of 2m as recorded by BH1 remaining dry throughout the monitoring period 13/1/26 to 15/3/26. Observations in BH2 revealed occasional peak water levels to within 0.9m of ground level and seeming to correspond with infiltration of surface water during heavy rainfall. This was further investigated by installation of a datalogger in BH2 to continually record water level and the results are included on the appended charts. Interpretation of the monitoring results is discussed in the following section of this report. Monitoring has now ceased but standpipes remain in place should further monitoring be required in the future.

- 1.8 The soakage testing was impacted by heavy rain during the test period. Tests were recorded by manual observation supplemented by continuous recording by dataloggers. Where apparent and significant the influence of rain infiltration has been filtered out. A summary of the infiltration test results and the derived infiltration rates is presented 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) (see note)
TP1	0.31 x 1.1 x 1.0	1	170	1254	330	* 9.2×10^{-7}
		2	100	4220	825	7.7×10^{-7}
		3	155	1020	385	* 7.5×10^{-7}
		4	199	2310	540	* 6.0×10^{-7}
TP2	0.31 x 1.1 x 1.0	1	225	280	725	9.6×10^{-6}
		2	170	520	830	5.4×10^{-6}
		3	95	650	905	4.7×10^{-6}

Note: Infiltration Coefficients marked * are based on projected results

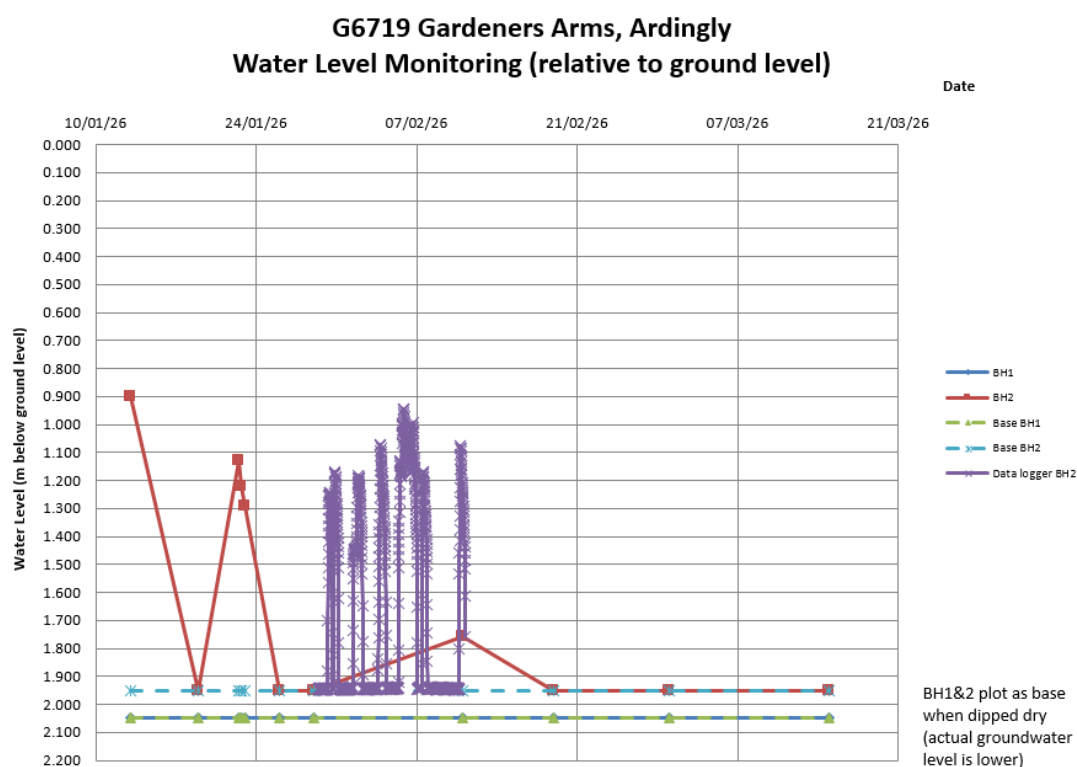
- 1.9 The lowest infiltration coefficients that were determined for trial pits TP1 and TP2 were 6.0×10^{-7} m/s and 4.7×10^{-6} m/s respectively. The influence of rainfall during the testing period is discussed in the following section of this report.
- 1.10 Ground conditions should be verified during construction and further testing would be recommended if conditions differ from those encountered during this investigation.
- 1.11 The work was carried out for Hall and Woodhouse with instruction from Simon Dent Associates and PSE Associates. 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 DISCUSSION

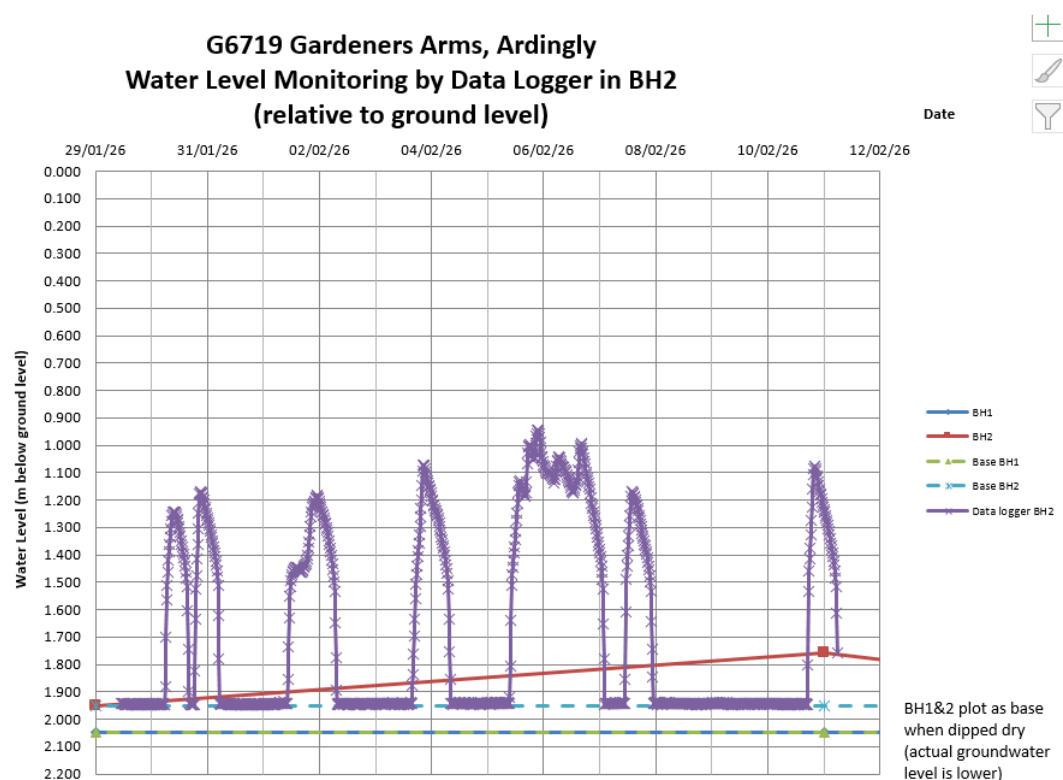
2.1 Groundwater level monitoring

On 13/1/26 two standpipes were installed on the site at locations BH1 and BH2. Prolonged heavy rainfall was recorded prior to and during the installation visit. Groundwater was observed at 0.9m bgl in BH2 shortly after excavation but not encountered during excavation of BH1. Both boreholes terminated at a depth of 2m due to the presence of sandstone layers preventing further excavation with the dynamic sampling rig.

During the monitoring period following installation on 13/1/26 until latest readings on 15/3/26 recorded BH1 to remain dry to the base 2.05m bgl throughout:



During initial observations, the fluctuation of water level in BH2 and comparison with BH1 observations was considered inconsistent with normal groundwater behaviour and this was investigated through installation of a data logger to continuously monitor water levels. The data logger was installed for the period 29/1/26 to 11/2/26 that included a number of heavy rainfall events (site specific rainfall records were not collected).



It was observed that the water level in the standpipe rose rapidly during the rainfall events and then dropped rapidly after the event with the recorded level typically falling by 500mm in 45 minutes. This is clearly not recording fluctuation of the groundwater table and is considered to represent seepage of surface water into the open borehole that then soaks away. The contrast with observations in BH1 indicate this is due to local variation in the ground conditions.

It is concluded that the true groundwater level at the site during the monitoring period remained below the base of the standpipes (2m bgl).

2.2 Soakage Test Interpretation

Soakage tests were carried out on the site within two 1m deep pits referenced as TP1 and TP2. Periods of heavy rainfall were recorded during the period of testing that ran from 22/1/26 to 29/1/26.

Comparison of the results indicate the testing within TP1 was heavily influenced by seepage into the pit during rainfall. This is illustrated by reference to the levels recorded by data logger that shows a rise in water level during periods of rain shown below:



Analysis of the test data presented within earlier reporting and as attached has attempted to filter out the effect of the rain by removing the rising sections of the curves. Further consideration concludes that there will have been additional underlying influence due to ongoing seepage into the pits that has not been factored out. All the derived infiltration coefficients should therefore be considered lower bound and actual values are expected to be higher.

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PROJECT NO: G6719

FIGURE REF: Figure 1

PROJECT: Gardeners Arms, Ardingly

PREPARED: AJHT

SECTION: Groundwater Monitoring and Soakage Testing

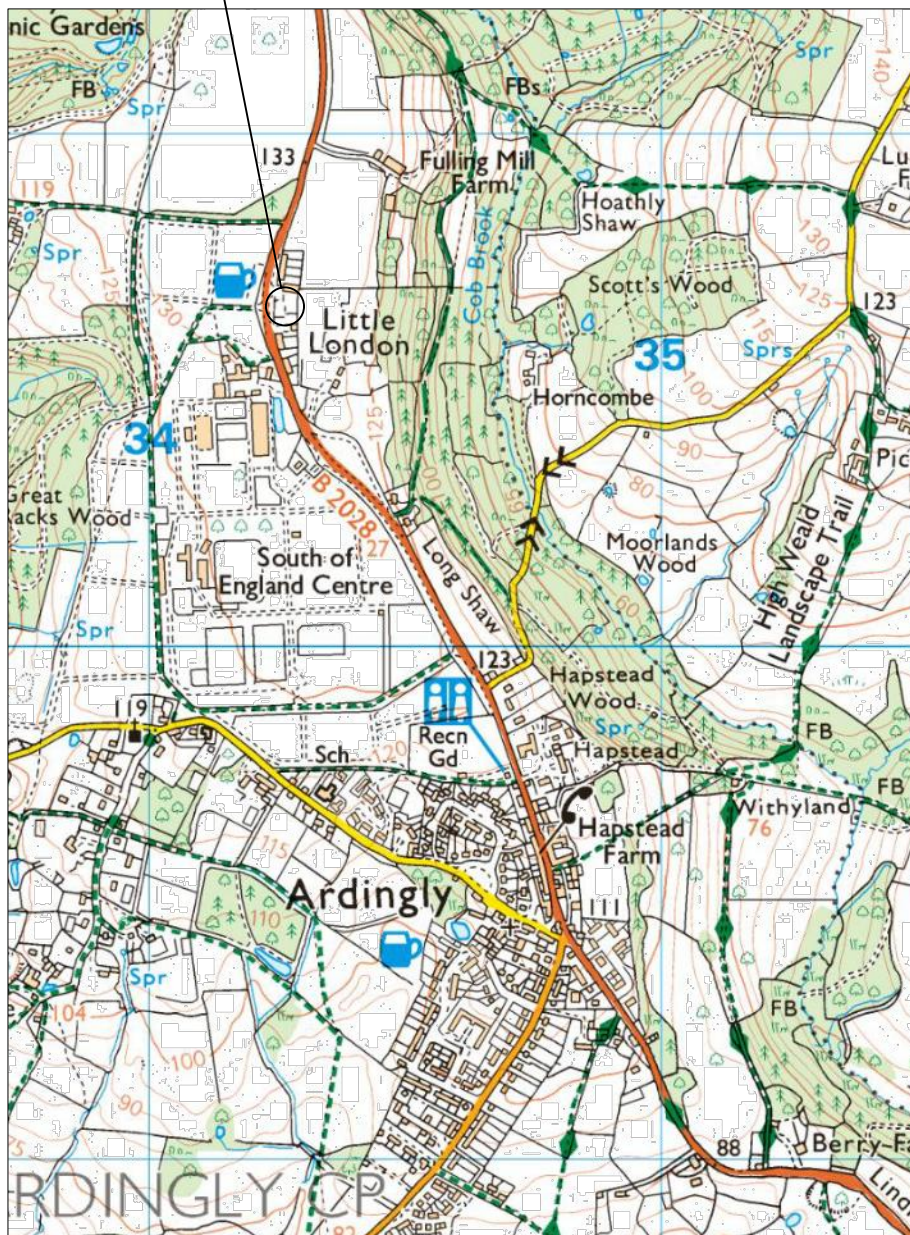
CHECKED: AJHT

TITLE: Site Location Plan

DATE: Jan 2026

Site Location

North
(Not to scale)



DATE: Jan 2026

North
(Approx)



Based on SD Associates drawing dated 15/12/25

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Site
Gardeners Arms, Ardingly

Number
BH1

Excavation Method Dynamic (windowless) sampling using Archway Dart		Dimensions 100mm to 1.00m 90/80/70 to 1.60m 60/50 to 2.05m		Ground Level (mOD) 130.60		Client Hall and Woodhouse		Job Number G6719	
		Location See Location Plan		Dates 13/01/2026		Engineer SDA Engineers		Sheet 1/1	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50-0.70	D1			130.45	0.15	Grass over moist dark brown slightly sandy slightly clayey organic rich silt TOPSOIL with occasional fine to medium subangular sandstone and flint gravel		
					0.35	Moist firm slightly friable slightly sandy (fine) CLAY / SILT with a little coarse medium and fine angular to subangular flint and sandstone gravel. Rare fine brick fragments. (Possibly reworked)		
				130.10	0.50	Stiff yellow brown slightly clayey sandy (fine) SILT with some coarse medium and fine angular blocky sandstone gravel		
0.70-1.80	D2			129.90	0.70	Yellow brown and brown thinly bedded (2-6mm) sandstone. Recovered as moderately weak coarse medium and fine tabular sandstone gravel		
					1.10			
1.80-2.00	D3			128.80	1.80	Light yellow slightly silty fine SAND with a little fine and medium gravel of weakly cemented sand		
				128.55	2.05	Complete at 2.05m		

Remarks
 Borehole remained stable and open during excavation
 19mm dia standpipe installed on completion - 1m slotted with geosoc and gravel surround then plain with bentonite pellet seal and flush cover
 Groundwater was not encountered. Standpipe remained dry 2hrs after installation
 Ground level estimated by reference to topo survey on Simon Dent Associates' drawing dated Dec 2025

Scale (approx)
1:20

Logged By
AT

Figure No.
G6719.BH1

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Site
Gardeners Arms, Ardingly

Number
BH2

Excavation Method Dynamic (windowless) sampling using Archway Dart		Dimensions 100mm to 1.00m 90/80/70 to 1.60m 60/50 to 2.05m		Ground Level (mOD) 130.60		Client Hall and Woodhouse		Job Number G6719	
		Location See Location Plan		Dates 13/01/2026		Engineer SDA Engineers		Sheet 1/1	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.70-1.00	D1			129.95	(0.65)	Grass over moist dark brown slightly sandy (fine) slightly clayey silty TOPSOIL / MADE GROUND with occasional medium and fine subangular gravel of sandstone and flint		
					0.65	... whole brick at 0.5m bgl		
1.20-1.40	D2			129.50	1.10	Firm brown slightly clayey sandy SILT with occasional medium and fine sandstone gravel		
					(0.45)			
1.40-1.90	D3			129.20	1.40	Yellow brown thinly bedded SANDSTONE. Recovered as coarse medium and fine subangular blocky / tabular gravel of moderately weak sandstone		
					(0.30)			
1.90-2.00	D4			128.70	1.90	Dense silty fine SAND interbedded with extremely thinly laminated (1-4mm) sandstone and siltstone		
					(0.50)			
					128.55	2.05	Light yellow slightly silty fine SAND interbedded (?) with thin layers (2-5mm) sandstone recovered as fine to medium gravel	
						Complete at 2.05m		

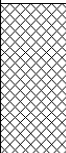
Remarks
 Borehole remained stable and open during excavation
 19mm dia standpipe installed on completion - 1m slotted with geosoc and gravel surround then plain with bentonite pellet seal and flush cover
 Some groundwater seepage. Groundwater level rose to 0.9m bgl after 1 hr
 Ground level estimated by reference to topo survey on Simon Dent Associates' drawing dated Dec 2025

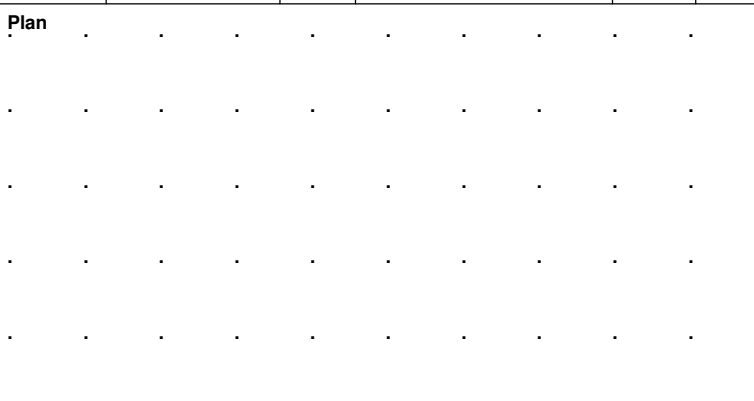
Scale (approx)
1:20

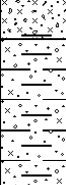
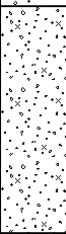
Logged By
AT

Figure No.
G6719.BH2

Excavation Method Machine excavated using Kubota U17-3	Dimensions 0.31 x 1.1	Ground Level (mOD) 130.25	Client Hall and Woodhouse	Job Number G6719
	Location See Location Plan	Dates 22/01/2026	Engineer SDA Engineers	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						MADE GROUND of coarse subrounded to rounded flint gravel on compact brick rubble fill comprising whole / half brick and concrete with some sandy coarse medium and fine gravel of flint and brick		
				130.05	0.20 (0.20)	Firm brown and yellow brown sandy silty CLAY with a little sandstone gravel	   	
				129.85	0.40 (0.50)	Yellow brown coarse medium and fine subangular blocky GRAVEL of sandstone with much slightly clayey very silty fine to medium sand ... locally clayey	     	
				129.35	0.90 (0.10)	Yellow brown closely fractured (10-60mm) thinly bedded (5-20mm) weathered SANDSTONE recovered as coarse medium and fine weak to moderately weak subangular / blocky sandstone gravel with some very silty fine sand.	 	
				129.25	1.00	Occasional thin clay band. Complete at 1.00m	                           	

Plan 	Remarks		
	Pit sides stable and vertical during excavation		
	Groundwater was not encountered		
	Ground level estimated by reference to topo survey on Simon Dent Associates' drawing dated Dec 2025		
	Scale (approx)	Logged By	Figure No.
	1:10	AT	G6719.TP1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						MADE GROUND of coarse subrounded to rounded flint gravel on compact brick rubble fill comprising whole / half brick and concrete with some sandy coarse medium and fine gravel of flint and brick		
				130.04	0.20 (0.15)	Moist dark brown slightly sandy slightly clayey SILT with occasional fine and medium subangular flint gravel		
				129.89	0.35 (0.20)	Firm brown and yellow brown sandy silty CLAY with a little sandstone gravel		
				129.69	0.55 (0.30)	Yellow brown coarse medium and fine subangular / blocky sandstone GRAVEL with much very silty fine to medium sand		
				129.39	0.85 (0.15)	Yellow brown closely fractured (10-50mm) thinly bedded (5-10mm) weathered SANDSTONE recovered as coarse medium and fine extremely weak to weak subangular / blocky sandstone gravel with some silty fine sand.		
				129.24	1.00	Complete at 1.00m		

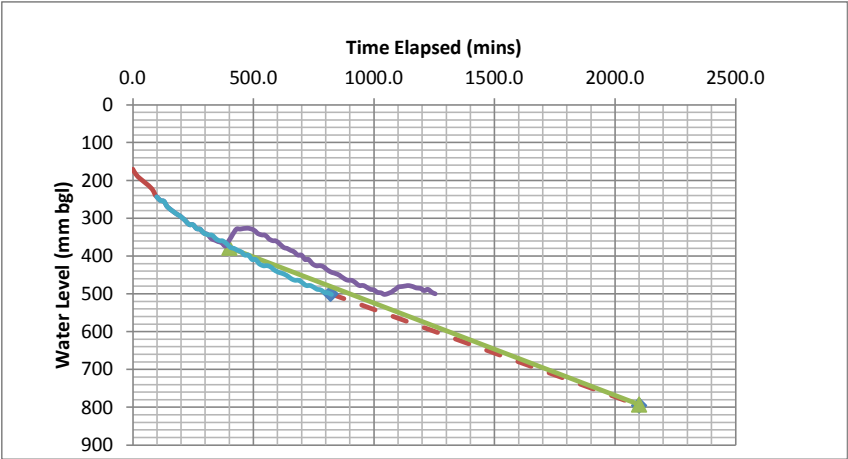
Produced by the GEOTECHNICAL DATAbase SYstem (GEODASY) (C) all rights reserved

Dimensions (m): width = 0.31 length = 1.10 depth = 1.00

Date	Time	Date and time	Elapsed	Dip
22/01/2026	14:49	22/01/2026 14:49	start	dry
22/01/2026	14:51	22/01/2026 14:51	0.0	170
22/01/2026	14:54:00	22/01/2026 14:54	3.0	175
22/01/2026	15:12:00	22/01/2026 15:12	21.0	190
22/01/2026	15:21:00	22/01/2026 15:21	30.0	195
22/01/2026	16:07:00	22/01/2026 16:07	76.0	220
22/01/2026	16:25:00	22/01/2026 16:25	94.0	240
23/01/2026	11:45:00	23/01/2026 11:45	1254.0	
			820.0	
			2100.0	
Test monitored using datalogger - plotted as purple line then adjusted to remove the influence of heavy rainfall and re-plotted as blue line				

End Fit
Weather
Rain/showers

500
795 Projected



	Time (mins)	
t0	170	
t25	377.5	400
t50	585	
t75	792.5	2100
t100	1000	
fall		0.83
t25 - t75		0.415
Area t50		1.5113

Infiltration Coefficient = 9.2E-07 m/s

Dimensions (m): width = 0.31 length = 1.10 depth = 1.00

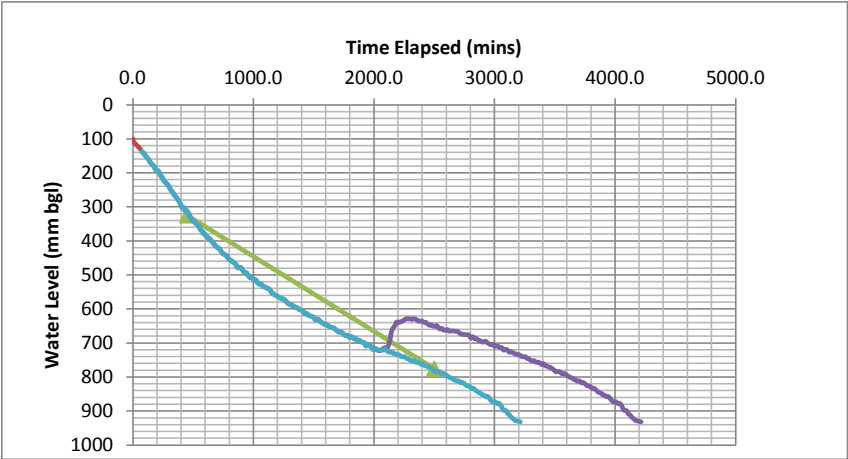
Date	Time	Date and time	Elapsed	Dip
23/01/2026	11:59	23/01/2026 11:59	start	500
23/01/2026	12:00	23/01/2026 12:00	0.0	100
23/01/2026	12:02:00	23/01/2026 12:02	2.0	105
23/01/2026	12:08:00	23/01/2026 12:08	8.0	110
23/01/2026	12:23:00	23/01/2026 12:23	23.0	115
23/01/2026	12:36:00	23/01/2026 12:36	36.0	120
23/01/2026	12:51:00	23/01/2026 12:51	51.0	125
23/01/2026	13:01:00	23/01/2026 13:01	61.0	130
26/01/2026	10:20:00	26/01/2026 10:20	4220.0	
Test monitored using datalogger - plotted as purple line then partially adjusted to remove some of the influence of heavy rainfall and re-plotted as blue line				

End Fit

Weather

Rain/showers

0
0 Projected



Time (mins)		
t0	100	
t25	325	450
t50	550	
t75	775	2500
t100	1000	
fall		0.9
t25 - t75		0.45
Area t50		1.61

Infiltration Coefficient = 7.7E-07 m/s

G6719 Gardeners Arms Ardingly Soakage Test

TP1 Test 3

Test Start Date: 26-Jan-26

Dimensions (m):

width = 0.31

length = 1.10

depth = 1.00

[illegible]

End Fit

Weather

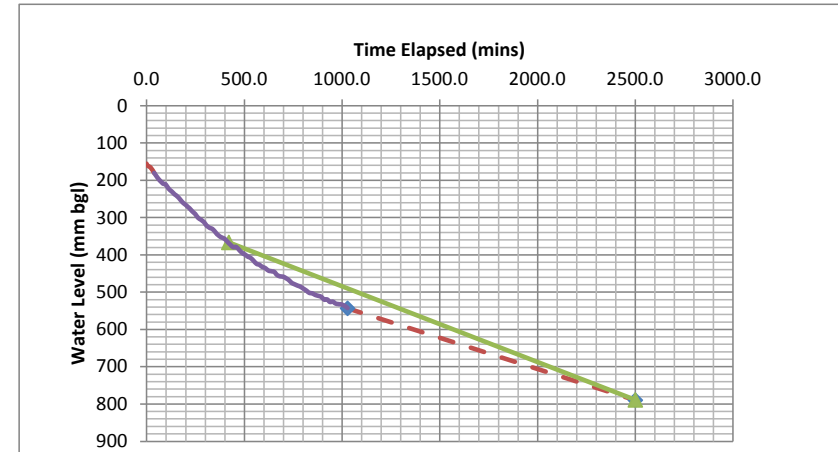
dry o'cast

v.heavy

rain
night26/1

543

790 Projected



		Time (mins)
t0	155	
t25	366.25	420
t50	577.5	
t75	788.75	2500
t100	1000	
	fall	0.845
	t25 - t75	0.4225
	Area t50	1.53245

Infiltration Coefficient =	7.5E-07 m/s
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G6719 Gardeners Arms Ardingly Soakage Test

TP1 Test 4

Test Start Date: 26-Jan-26

Dimensions (m):

width = 0.31

length = 1.10

depth = 1.00

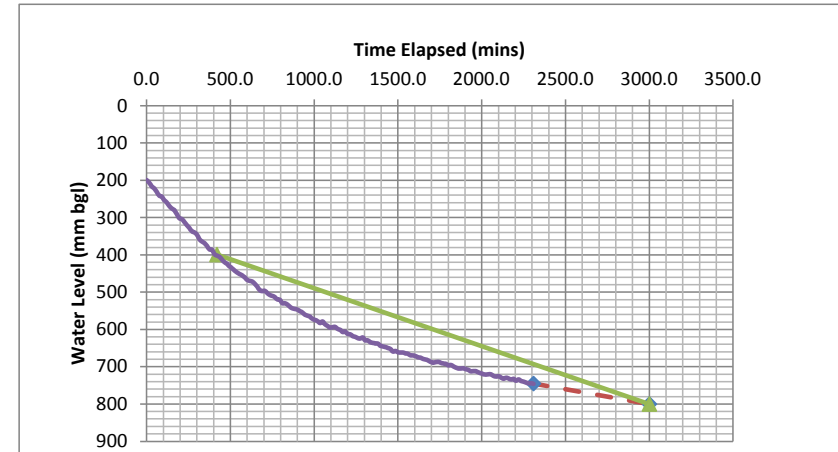
[illegible]

End Fit

Weather

745

800 Projected



		Time (mins)
t0	199	
t25	399.25	420
t50	599.5	
t75	799.75	3000
t100	1000	
	fall	0.801
	t25 - t75	0.4005
	Area t50	1.47041

Infiltration Coefficient =	6.0E-07 m/s
----------------------------	-------------

G6719 Gardeners Arms Ardingly Soakage Test

TP2 Test 1

Test Start Date: 22-Jan-26

Dimensions (m):

width = 0.31

length = 1.10

depth = 1.00

[illegible]

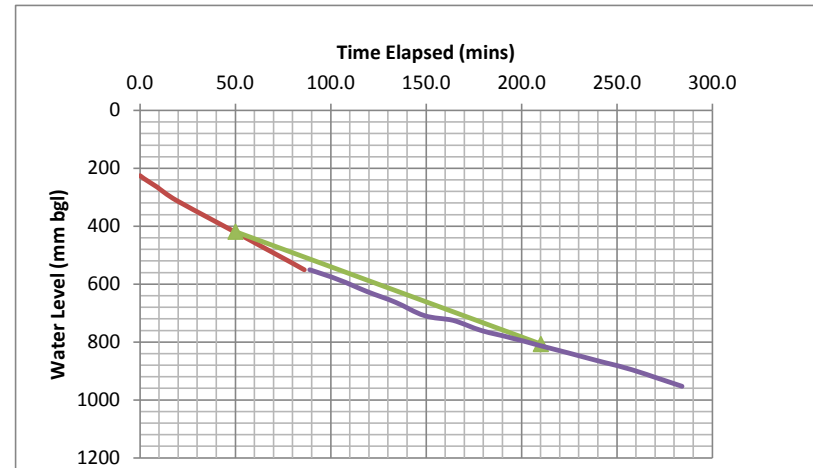
End Fit

Weather

Rain/showers

0

0 Projected



		Time (mins)
t0	225	
t25	418.75	50
t50	612.5	
t75	806.25	210
t100	1000	
	fall	0.775
	t25 - t75	0.3875
	Area t50	1.43375

Infiltration Coefficient =	9.6E-06 m/s
----------------------------	-------------

G6719 Gardeners Arms Ardingly Soakage Test

TP2 Test 2

Test Start Date: 23-Jan-26

Dimensions (m):

width = 0.31

length = 1.10

depth = 1.00

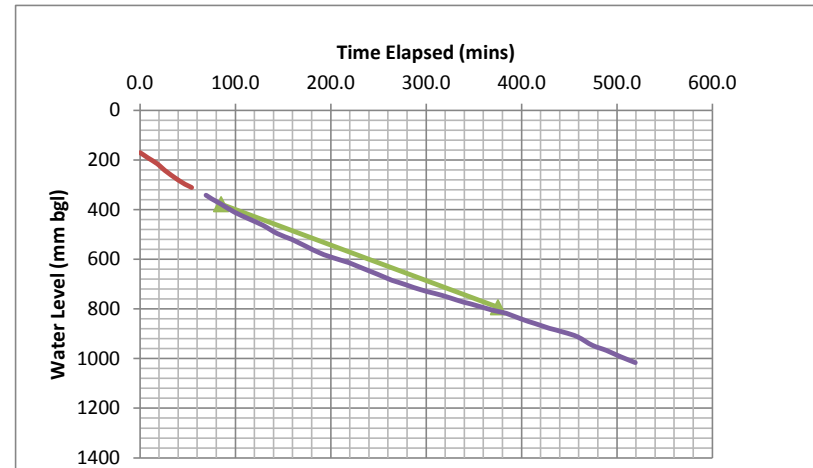
[illegible]

Weather

Rain/showers

0

0 Projected



	Time (mins)	
t0	170	
t25	377.5	85
t50	585	
t75	792.5	375
t100	1000	
fall		0.83
t25 - t75		0.415
Area t50		1.5113

Infiltration Coefficient = 5.4E-06 m/s

G6719 Gardeners Arms Ardingly Soakage Test

TP2 Test 3

Test Start Date: 26-Jan-26

Dimensions (m):

width = 0.31

length = 1.10

depth = 1.00

[illegible]

End Fit

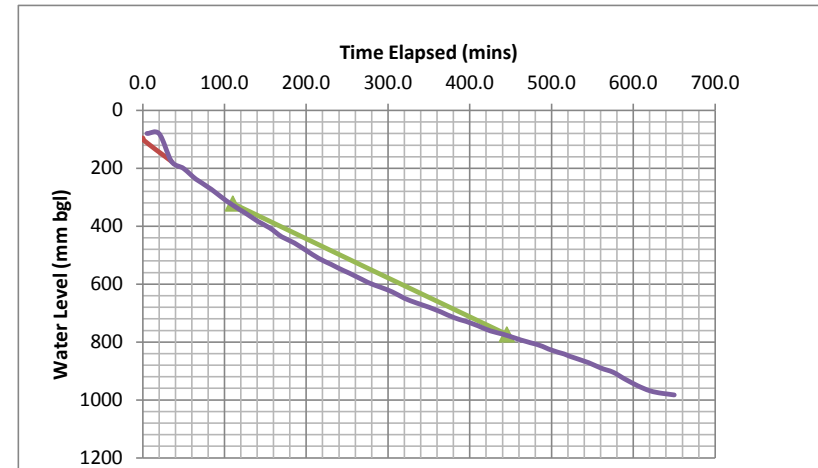
Weather

dry o'cast

v.heavy
rain
night26/1

0

0 Projected



	Time (mins)	
t0	95	
t25	321.25	110
t50	547.5	
t75	773.75	445
t100	1000	
fall		0.905
t25 - t75		0.4525
Area t50		1.61705

Infiltration Coefficient = 4.7E-06 m/s

Project No: G6719
Gardeners Arms, Ardingly
11-Feb-26

		BH1	BH2		
Upstand (m)		0.000	0.000		
	Ground Level (mAOD)	130.600	130.600		
	Cover level (mAOD)	130.600	130.600		
	Base dip (m)	2.050	1.950		

mAOD: metres Above Ordnance Datum

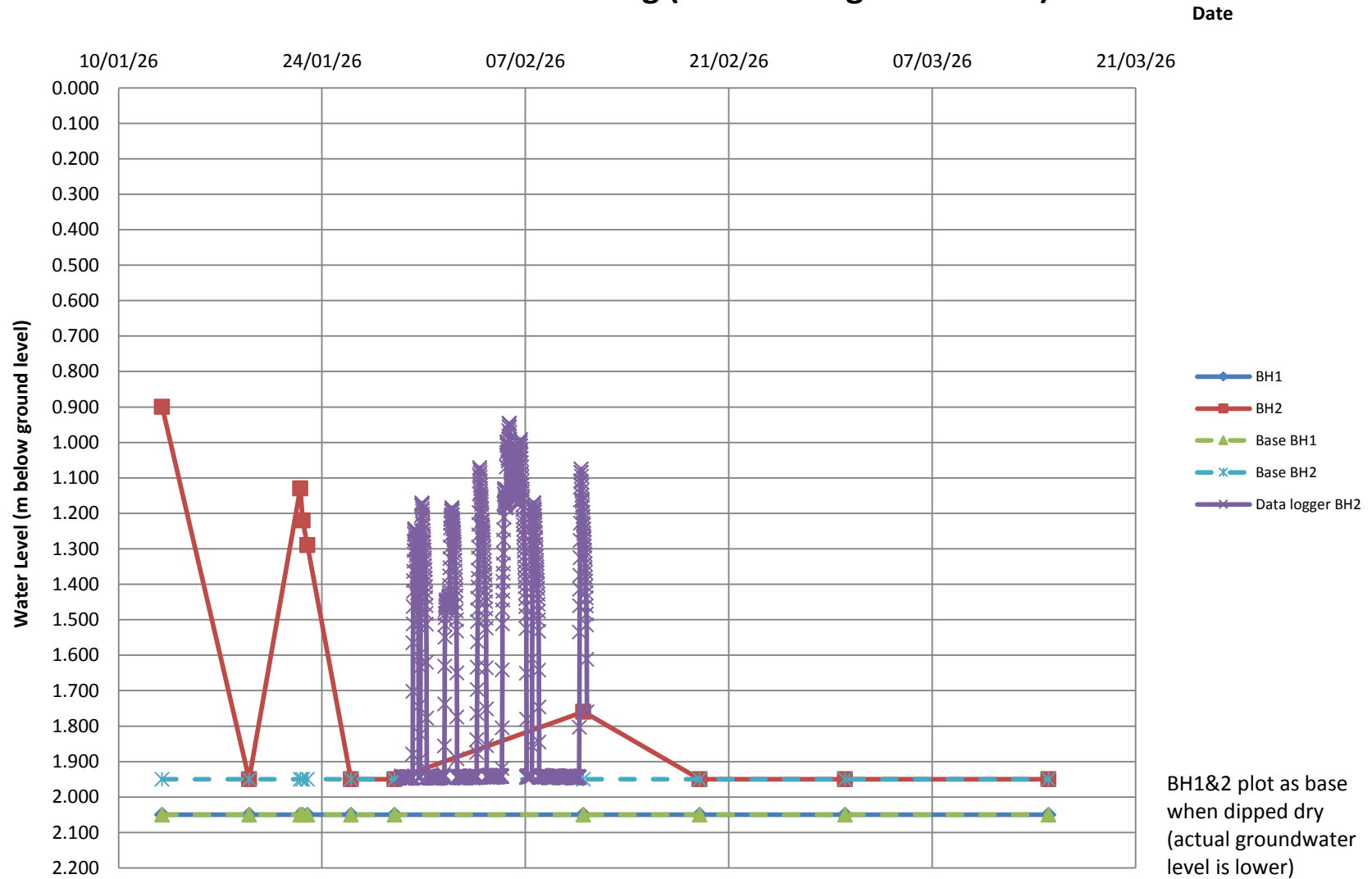
Ground levels estimated by reference to topo survey presented within Simon Dents Associates Drg dated Dec 2025

** Note : When BH recorded dry to base level plotted as 2.05m bgl and 128.55m AOD

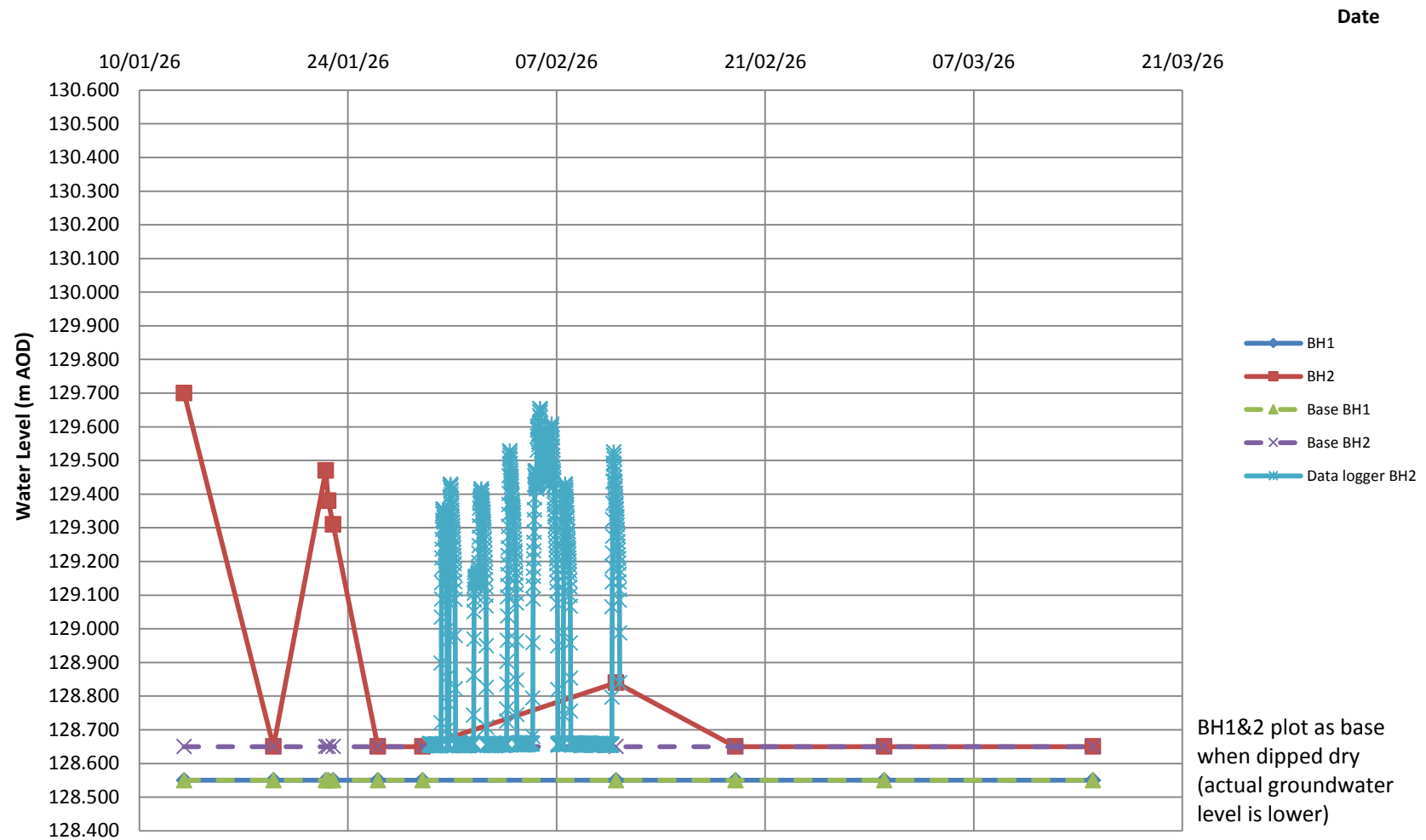
[illegible]

G6719 Gardeners Arms, Ardingly

Water Level Monitoring (relative to ground level)



G6719 Gardeners Arms, Ardingly Water Level Monitoring (relative to Ordnance Datum)





Photograph 1 : BH1 location



Photograph 2 : Samples extracted BH1



Photograph 3 : BH2 location



Photograph 4 : Samples extracted BH2



Photograph 5 : Excavation TP1



Photograph 6 : Trial Pit TP1 Arisings



Photograph 7 : Excavation TP2



Photograph 8 : Arisings TP2