

Woking Football Club

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P1381J1460/PSw/v1.1

02/07/2019

## WOKING FOOTBALL CLUB, KINGFIELD ROAD, WOKING, SURREY, GU22 9AA: SOIL INFILTRATION TESTING

Jomas attended the above-mentioned site under instruction by Woking Football Club on 21st June 2019 to carry out falling head permeability tests within the boreholes previously installed on the site.

A full list of previous reports undertaken for the site by Jomas are detailed in Table 1 below:

**Table 1: Previous Reports - Jomas**

Title	Author	Reference	Date
Desk Study / Preliminary Risk Assessment Report For Woking Football Club, Laithwaite Community Stadium, Kingfield Road, Kingfield, Woking, GU22 9AA	Jomas Associates Ltd	P1381J1460/AM Final V1.0	17 August 2018
Woking Football Club, Laithwaite Community Stadium, Kingfield Road, Woking, GU22 9AA Geo-Environmental Scoping Letter	Jomas Associates Ltd	P1381j1460/Amm	18 April 2019
Geo-Environmental & Geotechnical Assessment (Ground Investigation) Report, Woking Football Club, Laithwaite Community Stadium, Kingfield Road, Woking, GU22 9AA	Jomas Associates Ltd	P1381J1460/AMM Final V1.0	30 April 2019

This phase of work did not involve any further intrusive investigation works.

### Ground Conditions

Full logs of the ground conditions observed on site are included in Appendix 2 of the ground investigation report, however, a summary of the ground conditions is provided below:

**Table 2: Ground Conditions Previously Encountered**

Stratum and Description	Encountered from (m bgl)	Base of strata (m bgl)	Thickness range (m)
Asphalt. (MADE GROUND)	0.0	0.05 – 0.20	0.05 – 0.20
Brown sandy gravelly clay with rootlets. Sand is fine. Gravel consists of flint, concrete, brick and asphalt fragments. (MADE GROUND – Topsoil) Encountered in WS4 and WS5 only	0.0	0.30 – 0.50	0.30 – 0.50
Black to brown slightly clayey sandy gravel. Sand is fine to medium. Gravel consists of flint, brick, concrete, asphalt, glass and ceramic fragments. (MADE GROUND)	0.05 – 0.30	0.30 – 1.10	0.18 – 1.15
Black to brown clayey gravelly sand. Sand is medium. Gravel consists of fine to coarse flint and asphalt fragments. (MADE GROUND)	0.30 – 1.10	0.70 – 1.40	0.25 – 0.90
Loose to very dense orange to grey silty clayey very gravelly SAND. Sand is fine. Gravel consists of flint. (KEMPTON PARK GRAVEL)	0.30 – 1.40	2.00 – 4.15	0.70 – 3.20
Medium to very dense grey silty SAND. Sand is medium to coarse. (BAGSHOT FORMATION)	2.00 – 3.60	3.75 – 25.00	0.85 – 22.30

**Falling Head Permeability Tests**

The determination of permeability of the underlying ground was undertaken by carrying out insitu falling head tests. These were carried out to conform with the methodology for falling head permeability test formerly outlined in BS: 5930 (1999) and recently in BS EN ISO 22282-2.

Copies of the results and calculations are appended to this letter.

Falling head permeability tests were carried out in 2no. historically installed boreholes. Jomas has not been provided with details of these installs. It is assumed that the hole had been drilled with 150mm casing. Similarly, the installation is assumed to be 1m of plain pipe with slotted to the base of the well at 4.3m (HBH2) and 5.9m (HBH4)

1No test lasting for approximately 1hour was undertaken in each location, the results of these tests are summarised below with the full calculation and result sheets appended to this letter.

Hole ID	Calculated Permeability (m/s)	Indicative Permeability*	Indicative Drainage Conditions*
HBH2	$4.05 \times 10^{-5}$	Low	Good
HBH4	$2.15 \times 10^{-4}$	Medium	Good
WS2	$2.66 \times 10^{-6}$	Low	Poor
WS7	$6.11 \times 10^{-7}$	Very Low	Poor
WS10	$9.84 \times 10^{-7}$	Very Low	Poor
BH2	$9.31 \times 10^{-7}$	Very Low	Poor
BH3	$1.32 \times 10^{-5}$	Low	Good

\*After Casagrande and Fadum (1940)

We trust that this is satisfactory for your current needs, however please do not hesitate to contact the undersigned if we can be of further assistance on either this or any other project.

Yours sincerely,



Peter Swettenham BSc (Hons) MSc PgCert CEnv MIEEnvSc

Principal Geotechnical Engineer

**Enc.**

Appendix 1 – Figures

Appendix 2 – Infiltration Rates – Results and Calculations

## APPENDIX 1 – FIGURES



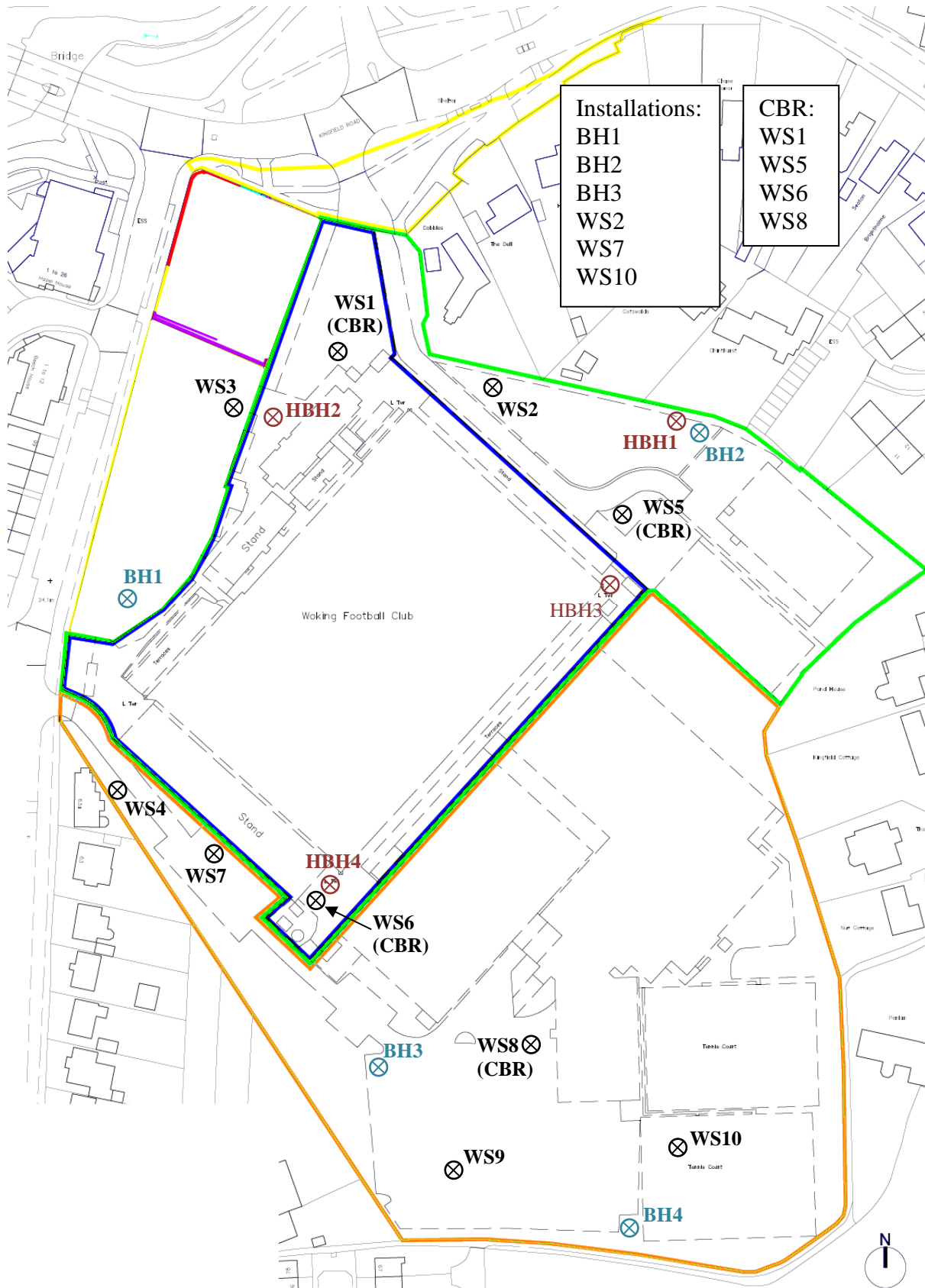
<b>Project Name</b>	Kingfield Road, Woking	<b>Client</b>	Woking Football Club
<b>Project No.</b>	P1381J1460	<b>Date</b>	16/08/2018
<b>Title</b>	Site Location Plan	<b>Prepared By</b>	AM





<b>Project Name</b>	Kingfield Road, Woking	<b>Client</b>	Woking Football Club
<b>Project No.</b>	P1381J1460	<b>Date</b>	March 2019
<b>Title</b>	Exploratory Holes	<b>Prepared By</b>	JLW

⊗ Windowless Sampler Borehole    ⊗ Cable Borehole    ⊗ Historical Borehole



## APPENDIX 2 – INFILTRATION RATES – RESULTS AND CALCULATIONS













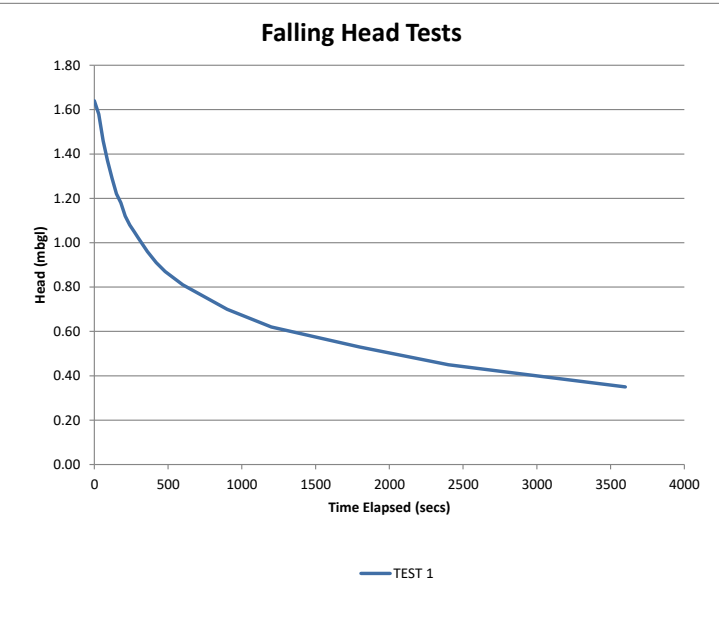
### FALLING HEAD TEST RECORD



<b>Site</b> Kingsfield Road, Woking	<b>Ground Level</b>	<b>Hole Nr</b> BH2
<b>Date</b> 21/06/2019	<b>Nat Grid Co-ordinates</b>	<b>Project Nr</b> P1381J1460
	<b>Engineer</b> JPB	

<b>Borehole Dimensions</b> Borehole Diameter (m) 0.150 Standpipe Diameter (m) 5.00 Length of Slotted Pipe (m) Type D F (Intake Factor) 8.78E+00 A (Cross-sectional Area) 0.0177	<b>Well Installation Details (mbgl)</b> 0 - 1m Plain pipe with bentonite surround 1m - 6m slotted with gravel surround 6.0m - 25m backfilled with arisings	<b>Ground Conditions</b>  Standing Water Level (mbgl): 2.29
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Elapsed time secs	TEST 1		TEST 2		TEST 3	
	Depth to Water mbgl	Head m	Depth to Water mbgl	Head m	Depth to Water (Dw) mbgl	Head (Dg) m
0	0.65	1.64				
30	0.71	1.58				
60	0.83	1.46				
90	0.92	1.37				
120	1.00	1.29				
150	1.07	1.22				
180	1.11	1.18				
210	1.17	1.12				
240	1.21	1.08				
270	1.24	1.05				
300	1.27	1.02				
360	1.33	0.96				
420	1.38	0.91				
480	1.42	0.87				
600	1.48	0.81				
900	1.59	0.70				
1200	1.67	0.62				
1800	1.76	0.53				
2400	1.84	0.45				
3000	1.89	0.40				
3600	1.94	0.35				



	TEST 1	TEST 2	TEST 3
t1 (sec)	30		
t2 (sec)	3000		
t2-t1 (sec)	2970		
h1 (m)	1.58		
h2 (m)	0.40		
Permeability -k - (m/sec)	9.31E-07		

	Remarks:
	Approved By: PSW

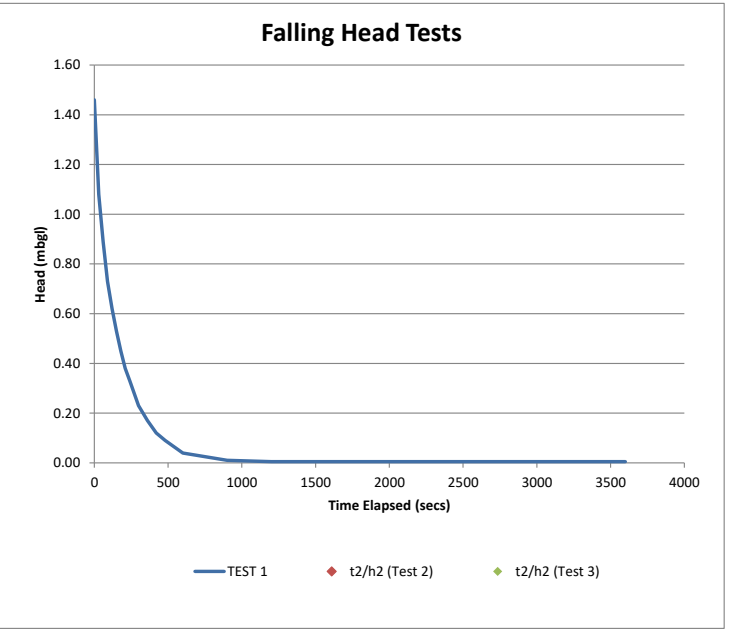


### FALLING HEAD TEST RECORD



<b>Site</b> Kingsfield Road, Woking	<b>Ground Level</b>	<b>Hole Nr</b> BH3	
<b>Date</b> 21/06/2019	<b>Nat Grid Co-ordinates</b>	<b>Project Nr</b> P1381J1460	
<b>Borehole Dimensions</b>	<b>Well Installation Details (mbgl)</b>	<b>Ground Conditions</b>	
<b>Borehole Diameter (m)</b> <b>Standpipe Diameter (m)</b> <b>Length of Slotted Pipe (m)</b> <b>F (Intake Factor)</b> <b>A (Cross-sectional Area)</b>	0 - 1m Plain pipe with bentonite surround 1m - 5m slotted with gravel surround 5.0m - 25m backfilled with arisings	Standing Water Level (mbgl): 1.7	

Elapsed time secs	TEST 1		TEST 2		TEST 3	
	Depth to Water mbgl	Head m	Depth to Water mbgl	Head m	Depth to Water (Dw) mbgl	Head (Dg) m
0	0.24	1.46				
30	0.62	1.08				
60	0.81	0.89				
90	0.97	0.73				
120	1.08	0.62				
150	1.17	0.53				
180	1.25	0.45				
210	1.32	0.38				
240	1.37	0.33				
270	1.42	0.28				
300	1.47	0.23				
360	1.53	0.17				
420	1.58	0.12				
480	1.61	0.09				
600	1.66	0.04				
900	1.69	0.01				
1200	1.70	0.00				
1800	1.70	0.00				
2400	1.70	0.00				
3000	1.70	0.00				
3600	1.70	0.00				
	TEST 1	TEST 2	TEST 3			
t1 (sec)	30					
t2 (sec)	360					
t2-t1 (sec)	330					
h1 (m)	1.08					
h2 (m)	0.17					
Permeability -k - (m/sec)	1.32E-05					



Remarks:  
Approved By: PSw