

Infiltration Test Report for the Proposed Development at The Coppice, Burbage, Hinckley LE10 2TF

for:

Springbourne Homes Ltd, Bosworth Marina, Carlton Road, Market Bosworth CV13
6PG

Date	Issued	Revision
09 August 2024	Issued	A

Reference: 82907-03

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Approved by:



Dan Edwards
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Director

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1. **EXECUTIVE SUMMARY**

1.1. General

- 1.1.1. This executive summary should be read in addition to the whole report and not on its own.
- 1.1.2. At the time of the investigation, the site comprised an undeveloped parcel of land, with the south western corner excavated to enable the archaeological investigation.
- 1.1.3. Nicholls Colton Geotechnical were appointed by Springbourne Homes Ltd to provide a ground investigation at The Coppice, Burbage, Hinckley. Overall, this report has enabled the nature of the ground to be established in respect of the environmental conditions on the site. The following report refer to the site and have been approved by the local authority:
 - Interpretative Report on a Ground Investigation for a Proposed Residential Development on Land off The Coppice Burbage Near Hinckley Leicestershire (ref: G16195-IR dated July 2020)

1.2. Geology

- 1.2.1. Geological maps indicate that the site is underlain by bedrock known as the Mercia Mudstone Group, described as a red mudstone, with subordinate siltstone, designated as a secondary B aquifer.
- 1.2.2. Superficial deposits comprise the Wolston Sand and Gravel, described as sand and gravel, with lenses of silt clay or peat, designated as a secondary A aquifer, with the Bosworth Clay Member, described as clay, designated as an unproductive aquifer, recorded along the eastern boundary.

1.3. Infiltration and Percolation Testing Assessment

- 1.3.1. In total two infiltration test, in line with BRE 365 were carried out (SA1 and SA2). The infiltration tests were carried out to assess the suitability of prevailing ground conditions for construction of soakaways, to deal with surface water drainage. Reference should be made to the appended soil infiltration reports.

- 1.3.2. The infiltration tests were carried out within SA1 and SA2 were excavated through the made ground and Bosworth Clay Member (SA1) and Wolston Sand and Gravel (SA2), to depths of 2.01m (SA1) and 1.60m (SA2).
- 1.3.3. During the filling of SA2, the water level rose to 1.17m, the boundary between the slightly silty sand and very clayey slightly silty sand. Upon reaching this level, water infiltrated through the slightly silty sand (encountered between 0.73m and 1.17m) at a similar rate or faster than the rate at which the water was added, therefore, the water level did not rise above 1.17m. Due to this the infiltration rate of the slightly silty sand (Wolston Sand and Gravel) could not be determined.
- 1.3.4. In summary water levels fell by 7cm over 240 minutes in SA1 and by 3cm over 240 minutes in SA2. Due to the negligible fall in water levels, the strata tested is classified as practically impermeable, therefore, unsuitable for the use of soakaways.
- 1.3.5. Given the fast infiltration rate observed during the filling of SA2, soakaways are considered to be suitable within slightly silty sands associated with the Wolston Sand and Gravel. Typical infiltration rates for such soils range between 1×10^{-5} m/s to 5×10^{-5} m/s.
- 1.3.6. During the Nichols Colton ground investigation, granular soils were encountered beneath the cohesive Wolston Sand and Gravel. Trial pits logs indicate that these soils are either silty or clayey and silty. For these soils, typical infiltration rates range between 1×10^{-7} m/s and 1×10^{-5} m/s.
- 1.3.7. Based on the findings of this report, soakaways can be adopted within the slightly silty Wolston Sand and Gravel encountered in SA2 between 0.73m and 1.17m based on an infiltration rate of 1×10^{-5} m/s. It is recommended that additional infiltration testing in line with BRE 365 is undertaken within this stratum to confirm accurate infiltration rates prior to construction of soakaways.

2. INTRODUCTION

- 2.1. This report has been prepared by PRP UK Ltd on the instruction of Springbourne Homes Ltd who proposes to construct eight residential dwellings, together with areas of hardstanding (roads and driveways) and soft landscaping (front and rear gardens). A proposed site plan is included within the appendix.
- 2.2. The purpose of the investigation was to obtain data on the ground conditions at the site so that suitable method of surface water management and drainage can be adopted.

3. **SITE LOCATION**

- 3.1. The site is located at National Grid reference easting: 444071, northing 293733. The site lies to the south west of The Coppice, Burbage, Hinckley.
- 3.2. The site is irregular in shape and occupies an area of approximately 0.9ha.
- 3.3. At the time of writing this report the site was an area of undeveloped land, with the south western corner excavated to enable the archaeological investigation.
- 3.4. Summary details of the site boundaries and adjacent land use are:

Boundary	Boundary Construction	Adjacent Land Use	Proximal Land Use
North	Hedge	Residential	Residential/ highways/ railway
East	Hedge	Agricultural land	Agricultural land
South	Hedge	Private track/ agricultural land	Residential
West	Hedge	Private road/residential	Residential

4. **FIELDWORK**

- 4.1. On Monday 15 July, two machine excavated trial pits were excavated for infiltration testing (SA1 and SA2). SA1 was excavated within the northern section of the site, towards the boundary of the site and the residential dwellings to the north. SA2 was excavated within the south eastern section of the site. It should be noted that due to the archaeological investigation taking place at the time of this investigation, test locations were limited.
- 4.2. The positions of the trial pit locations are shown on the appended trial pit location plan but confirmation of the exact position, if deemed appropriate and necessary, will need to be verified by dimensional survey work which was outside the scope of this report. However, this level of accuracy is not considered necessary at this stage.
- 4.3. The trial pits were positioned within areas suitable for the construction of soakaways.

5. GENERAL GEOLOGY AND REVEALED STRATA

- 5.1. Within the accuracy of the available geological information (British Geological Survey (BGS) Geology of Britain at a scale of 1:50,000) the solid geology beneath the site is indicated as being the Mercia Mudstone Group, described as a red mudstone, with subordinate siltstone, designated as a secondary B aquifer. Superficial deposits comprise the Wolston Sand and Gravel, described as sand and gravel, with lenses of silt clay or peat, designated as a secondary A aquifer, with the Bosworth Clay Member, described as clay, designated as an unproductive aquifer, recorded along the eastern boundary.
- 5.2. The trial pits carried out revealed that deposits of made ground comprising granular and cohesive soils can be found. Made ground deposits were being recorded overlaying deposits of the Bosworth Clay Member (SA1) and the Wolston Sand and Gravel (SA2). For full details of the strata encountered by the exploratory holes of this investigation, reference should be made to the appended trial pit logs. The salient features are, however, summarised below.
- 5.3. **Made ground** – recorded from ground level to depths ranging from 0.73 (SA2) to 1.50m (SA1), as a combination of granular and cohesive soils. Granular soils predominantly consisted of loose lightly silty, gravelly sand, with gravel sized fragments of brick, quartz, concrete and metal. Cohesive soils consisted of firm, soft in parts sandy gravelly clay, with gravel sized fragments of ceramic, metal plastic and occasional brick and slate. It should be noted that cohesive made ground soils were only encountered within SA1.
- 5.4. **Bosworth Clay Member**– encountered beneath the made ground to the base of SA1 as a firm orange brown sandy clay.
- 5.5. **Wolston Sand and Gravel**– encountered beneath the made ground to the base of SA2 as a combination of granular and cohesive soils. Granular soils consisted of loose to medium dense slightly silty sand and clayey, slightly silty sand. Cohesive soils consisted of firm sandy clay. It should be noted that during the Nicholls Colton Investigation granular soils were recorded beneath cohesive strata encountered within SA2. Reference should be made to trial pits logs TP10 and TP11 within the Nichols Colton report noted within section 1. Due to the limitations of this investigation, these granular soils were not revealed.
- 5.6. **Mercia Mudstone Group** - not encountered during this investigation.

- 5.7. No groundwater was encountered during the excavation of the trial pits, or the brief time they remained open.

6. INFILTRATION TESTING ASSESSMENT AND RECOMMENDATIONS

- 6.1. In total two infiltration test, in line with BRE 365 were carried out (SA1 and SA2). The infiltration tests were carried out to assess the suitability of prevailing ground conditions for construction of soakaways, to deal with surface water drainage. Reference should be made to the appended soil infiltration reports.
- 6.2. The infiltration tests were carried out within SA1 and SA2 were excavated through the made ground and Bosworth Clay Member (SA1) and Wolston Sand and Gravel (SA2), to depths of 2.01m (SA1) and 1.60m (SA2).
- 6.3. During the filling was SA2, the water level rose to 1.17m, the boundary between the slightly silty sand and very clayey slightly silty sand. Upon reaching this level, water infiltrated through the slightly silty sand (encountered between 0.73m and 1.17m) at a similar rate or faster than the rate at which the water was added, therefore, the water level did not rise above 1.17m. Due to this the infiltration rate of the slightly silty sand (Wolston Sand and Gravel) could not be determined.
- 6.4. In summary water levels fell by 7cm over 240 minutes in SA1 and by 3cm over 240 minutes in SA2. Due to the negligible fall in water levels, the strata tested is classified as practically impermeable, therefore, unsuitable for the use of soakaways.
- 6.5. Given the fast infiltration rate observed during the filling of SA2, soakaways are considered to be suitable within slightly silty sands associated with the Wolston Sand and Gravel. Typical infiltration rates for such soils range between 1×10^{-5} m/s to 5×10^{-5} m/s.
- 6.6. During the Nichols Colton ground investigation, granular soils were encountered beneath the cohesive Wolston Sand and Gravel. Trial pits logs indicate that these soils are either silty or clayey and silty. For these soils, typical infiltration rates range between 1×10^{-7} m/s and 1×10^{-5} m/s.
- 6.7. Based on the findings of this report, soakaways can be adopted within the slightly silty Wolston Sand and Gravel encountered in SA2 between 0.73m and 1.17m based on an infiltration rate of 1×10^{-5} m/s. It is recommended that additional infiltration testing in line with BRE 365 is undertaken within this stratum to confirm accurate infiltration rates prior to construction of soakaways.

APPENDIX I

SITE PLANS



- A - red line clarified - May 15 - JAF
- C - scheme reduced to 9 dwellings Nov 2019
- D - site area amended Jan 2020
- E - house type numbers amended Jan 2020
- F - plots 5 - 8 and road amended Feb 2020
- G - chicane added & turning head extended Apr 2020
- H - plot 9 removed to create additional green space June 2020
- J - chicane removed and bin collection points added June 2020
- K - plots 5 - 8 amended Feb 2021
- L - plot 5 handed March 2021
- M - retained trees to Southern boundary indicated March 2021
- N - parking and turning areas to plots 5 & 8 amended March 2021
- P - proposed footpath link added April 2021

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client			
Springbourne Homes Ltd			
project			
proposed housing off The Coppice Burbage			
drawing			
site layout			
scale	1: 500	sheet	
date	Jan 2015	author	JRH
job No	12/71	drawing No	26P

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APPENDIX II

TRIAL PIT LOCATION PLAN



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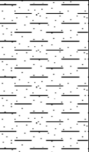
client			
Springbourne Homes Ltd			
project proposed housing off The Coppice Burbage			
drawing site layout			
scale 1 : 500		sheet	
date Jan 2015	author JRH	A2	
job No 12/71		drawing No 26P	

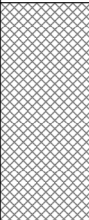
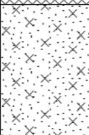
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APPENDIX III

TRIAL PIT LOGS

		Trial Pit Log										
Project Name: The Coppice				Client: Springbourne Homes Ltd				Date: 15/07/2024				
Location: Hinckley				Contractor:								
Project No. : 82907				Crew Name:				Equipment: Excavator				
Location Number SA1		Location Type TP		Level		Logged By DL		Scale 1:25		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
					0.28			MADE GROUND. Loose dark brown, gravelly, slightly silty fine to medium SAND. Gravel is fine to coarse, angular to rounded quartz, brick, metal and concrete.		1		
								MADE GROUND. Firm, soft in parts dark brown, sandy, gravelly CLAY. Gravel is fine to coarse, angular to rounded quartz, ceramic, metal, plastic and occasional brick and slate.				
								Firm orange brown sandy CLAY (Bosworth Clay Member).				
					1.50					2		
								End of Trial Pit at 2.010m				
					2.01					3		
										4		
										5		
Dimensions				Trench Support and Comment				Pumping Data				
Pit Length		Pit Width		Pit Stability		Shoring Used		Remarks		Date	Rate	Remarks
Remarks												
1. No groundwater encountered.												
2. Soakaway testing inline with BRE 365 undertaken. See separate sheet for details.												
3. Trial pit backfilled upon completion.												

		Trial Pit Log									
Project Name: The Coppice				Client: Springbourne Homes Ltd				Date: 15/07/2024			
Location: Hinckley				Contractor:							
Project No. : 82907				Crew Name:				Equipment: Excavator			
Location Number SA2		Location Type TP		Level		Logged By DL		Scale 1:25		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.73			MADE GROUND. Loose dark brown, slightly silty, gravelly fine to medium SAND. Gravel is fine to coarse, angular to rounded brick, quartz, concrete and metal.		1	
					1.17			Loose to medium dense, orange brown, slightly silty fine to medium SAND (Wolston Sand and Gravel).			
					1.40			Loose to medium dense orange brown very clayey, slightly silty fine to medium SAND (Wolston Sand and Gravel).			
					1.60			Firm orange brown sandy CLAY (Wolston Sand and Gravel).			
								End of Trial Pit at 1.600m			
										2	
										3	
										4	
										5	
Dimensions				Trench Support and Comment				Pumping Data			
Pit Length		Pit Width		Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks	
				Sides relatively unstable throughout excavation.							
Remarks											
1. No groundwater encountered.											
2. Soakaway testing inline with BRE 365 undertaken. See separate sheet for details.											
3. Trial pit backfilled upon completion.											

APPENDIX IV

INFILTRATION TEST REPORTS



PRP

consulting civil & structural engineers

Leicester
0116
275 1710

Northampton
01604
889870

Huntingdon
01832
710959

SOIL PERMEABILITY REPORT

Project No:

82907

Project:

The Coppice

Prepared by:

DL

Checked by:

DE

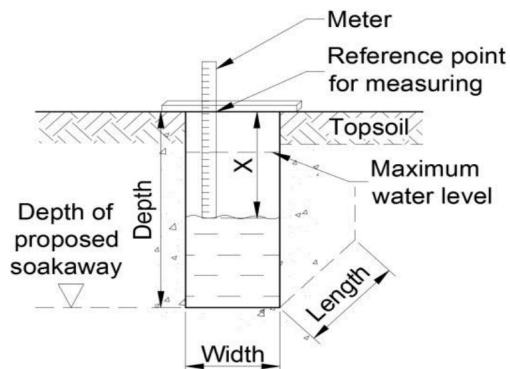
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01

SA1

Location / Grid Reference	
Soil type	Clay
Ground Water Level (m below GL)	Not encountered

Test Pit Size		
Length (m)	Width (m)	Depth (m)
3.40	1.00	2.01



		Site Readings		
No	Time (mins)	Time (hh:mm)	X - Ground to Water distance (m)	Level
1	0		1.59	
2	1		1.59	
3	2		1.59	
4	3		1.59	
5	4		1.59	
6	5		1.59	
7	10		1.59	
8	15		1.59	
9	20		1.60	
10	25		1.60	
11	30		1.60	
12	40		1.60	
13	50		1.60	
14	60		1.61	
15	70		1.61	
16	80		1.63	
17	90		1.63	
18	100		1.63	
19	110		1.63	
20	120		1.64	
21	130		1.65	
22	140		1.65	
23	150		1.65	
24	180		1.66	
25	210		1.66	
26	240		1.66	
27	270			

Negligible fall in water levels, strata classified as practically impermeable

SOIL INFILTRATION REPORT

Project No:

82907

Project:

The Coppice

Prepared by:

DL

0

Checked by:

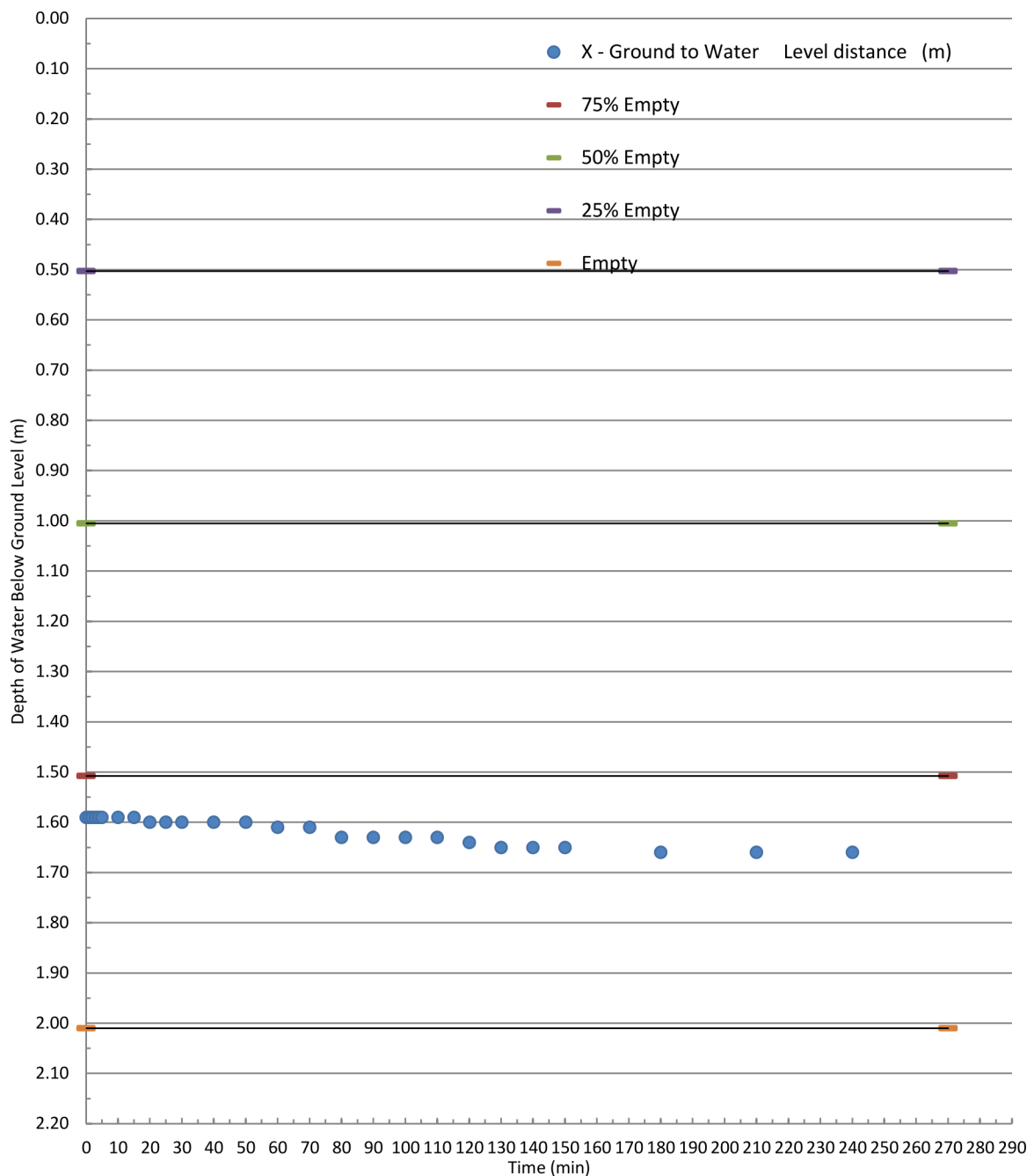
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02

SA1

Relationship Between Time and Depth of Water





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Huntingdon
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SOIL PERMEABILITY REPORT

Project No:

82907

Project:

The Coppice

Prepared by:

DL

Checked by:

DE

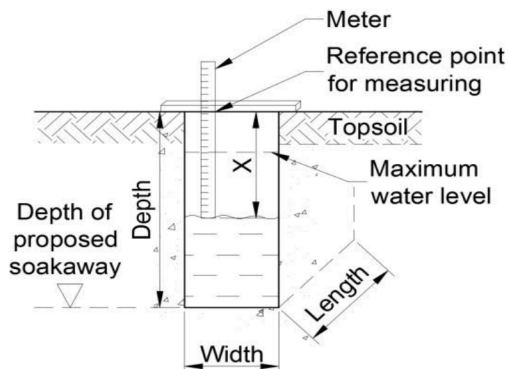
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SA2

Location / Grid Reference	
Soil type	Sand/clay
Ground Water Level (m below GL)	Not encountered

Test Pit Size		
Length (m)	Width (m)	Depth (m)
3.10	1.00	1.60



		Site Readings		
No	Time (mins)	Time (hh:mm)	X - Ground to Water distance (m)	Level
1	0		1.17	
2	1		1.17	
3	2		1.17	
4	3		1.17	
5	4		1.17	
6	5		1.17	
7	10		1.17	
8	15		1.17	
9	20		1.20	
10	25		1.20	
11	30		1.20	
12	40		1.20	
13	50		1.20	
14	60		1.20	
15	70		1.20	
16	80		1.20	
17	90		1.20	
18	100		1.20	
19	110		1.20	
20	120		1.20	
21	130		1.20	
22	140		1.20	
23	150		1.20	
24	180		1.20	
25	210		1.20	
26	240		1.20	
27	270			

Negligible fall in water levels, strata classified as practically impermeable



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SOIL INFILTRATION REPORT

Project No:

82907

Project:

The Coppice

Prepared by:

DL

0

Checked by:

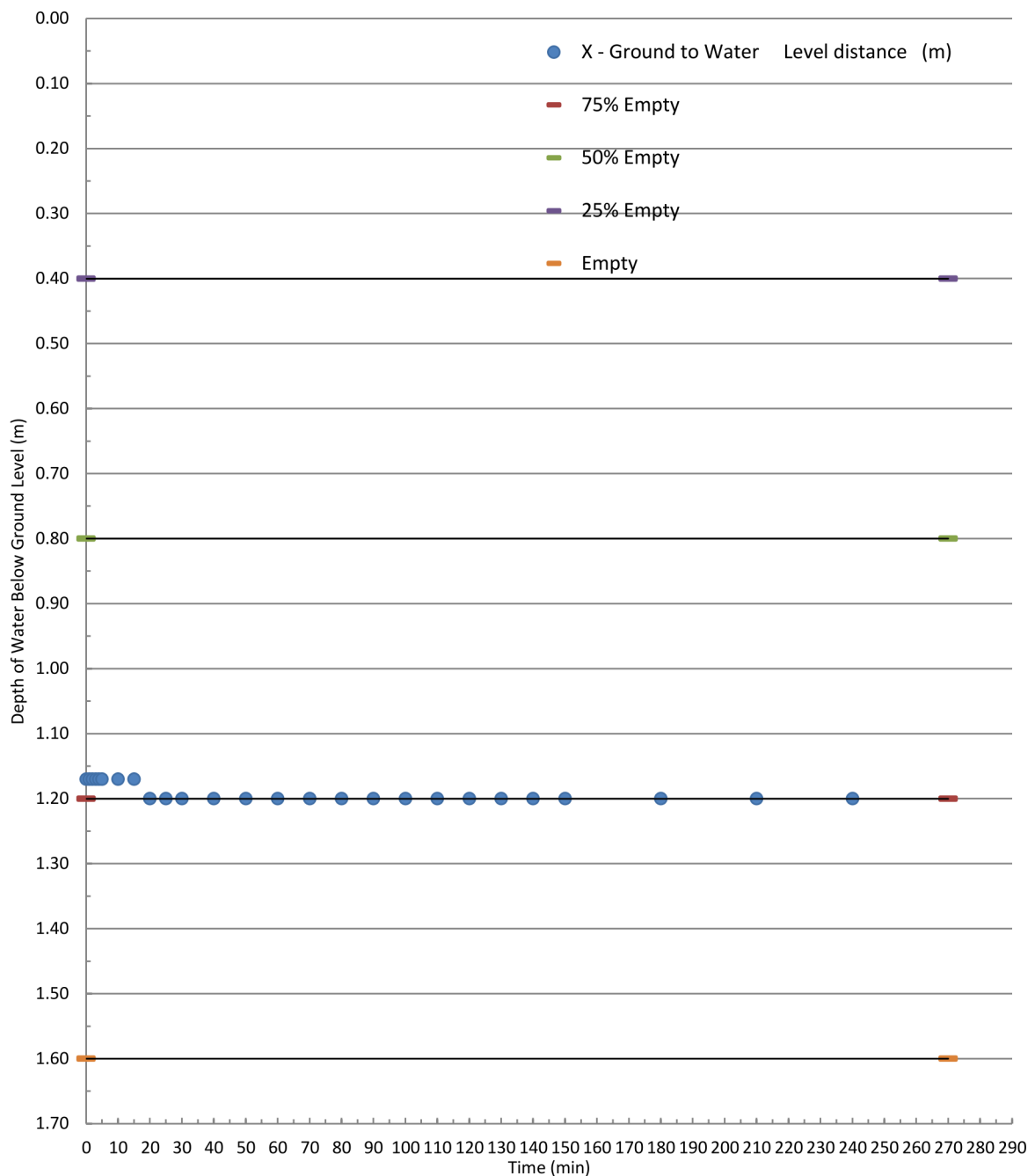
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Sheet:

02

SA2

Relationship Between Time and Depth of Water



APPENDIX V**GENERAL CONDITIONS**

1. This report has been prepared and written specifically for the client named in the introduction and is exclusively for his/her/their benefit. No reliance may be placed in the contents of this report by any third party except with the express agreement of the original client and the written agreement of PRP. Such written agreement may require the payment of an additional fee.
2. The recommendations sections of this report only provide an overview of the guidance and should not be specifically relied upon in their own right but should be considered in relation to the whole report and the development described in this report.
3. This report has been prepared and written in the context of the proposals for the development of the site as stated by the client and will not be valid in a differing context. Furthermore, new information, improved practices, or legislation may necessitate alterations to the report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of this report, it should be referred to us for reassessment.
4. The assessment and interpretation of contamination and associated risks are based upon the scope of the work described in the fee proposal and agreed with the client, the report may not be sufficient to fully address the contamination or allow a detailed remediation scheme to proceed without further investigation or analysis.
5. Any assessments made in this report are based on the ground conditions and as revealed by the test pits and boreholes together with the results of any field or laboratory testing undertaken and where appropriate other relevant data which may have been obtained for the site. The sources of such information are detailed in this report and while PRP use only such sources as are believed to be reliable, PRP will not be liable for the authenticity or reliability of information obtained from others.
6. Notwithstanding that factual reports from third parties concerning asbestos or mould of any kind may have been included for information purposes in this report, PRP will have no liability whatsoever for any claim or claims arising related to asbestos or mould of any kind.
7. There may also be special conditions appertaining to the site which were not revealed by the investigation and which will not, therefore, have been considered in this report. Any assessments may be subject to amendment in the light of additional information becoming available.
8. Whilst an opinion may be expressed or implied in this report on possible configurations of strata between or beyond test pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for the accuracy of such opinions.
9. Comments on groundwater conditions will have been based on observations made only at the time of the investigation unless otherwise stated. It should be noted, however, that groundwater levels vary due to seasonal and other effects.
10. This report is not a site categorisation, and hazards could occur which have not been detected.
11. Where data has been provided or is made available to PRP and this has been used in the report, it has been assumed that the information is correct. No responsibility can be accepted by PRP for inaccuracies within the data supplied.
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13. This report has been prepared solely for the client's purposes in obtaining planning permission and discharge of the planning conditions related to the proposed development indicated in the report. The discharge of these conditions does not constitute that the site could be determined under Part IIA of the Environmental Protection Act 1990.