

Infiltration Test Report

For the

Proposed Development

at

Kyngs Golf and Country Club, Station Road, Market Bosworth

for:

Statue Homes Limited, Old House Farm, Sutton Lane, Cadeby, Leicestershire CV13 0AR

Date	Issued	Revision
13 March 2023	Planning	A

Reference: 82633-01

Prepared by:



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BSc (Hons) FGS
Geo-environmental Engineer

Approved by:



Dan Edwards
MEng CEng MICE
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 writing this report, the site comprised a golf course, with areas of hardstanding (car park and access road) and temporary building. An existing site plan is included within the appendix.

1.2. Geology

- 1.2.1. Geological maps indicate that the site is underlain by the bedrock formation known as the Gunthorpe Member, described as red brown mudstone siltstone and sandstone.
- 1.2.2. Superficial deposits are recorded as the Bosworth Clay Member, described as clay and silt.

1.3. Infiltration Testing Assessment

- 1.3.1. Three infiltration tests (SA1-SA3), were undertake, in line with BRE 365 guidelines, 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 tests were carried out within SA1-SA3 and were excavated through the made ground and Bosworth Clay Member to depths of 1.50m (SA1), 1.80m (SA2) and 2.00m (SA3). In summary water levels fell by 2cm over 240 minutes in SA1 and 3cm over 240 minutes in SA2 and SA3. Due to the negligible fall in water level, the strata encountered can be classified as practically impermeable, therefore, an alternative method of dealing with surface water drainage should be adopted.

2. INTRODUCTION

- 2.1. This report has been prepared by PRP UK Ltd on the instruction of Statue Homes Limited who propose to construct a club house, commercial units and car park. 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.
- 2.3. The conditions stated in the appendix to the report were applied to this investigation and the report is to be read and constructed accordingly. Terms of Reference are also appended to this document.

3. SITE LOCATION

- 3.1. The site is located at National Grid reference 439596, 303374. The site lies to the north of Station Road, Market Bosworth.
- 3.2. The area to be developed is irregular in shape and occupied an area of approximately 1.7ha.
- 3.3. As the site is currently an inactive golf course, site levels are variable. A topographical survey is included within the appendix.

4. FIELDWORK

- 4.1. On Friday 24 February 2023 three machine excavated trial pits (SA1-SA3) were excavated across the development area, to a depth of 1.50m (SA1), 1.80m (SA2) and 2.00m (SA3). Infiltration testing in line with BRE 365 guidelines was conducted within all trial pits.
- 4.2. The positions of the trial pits are shown on the appended trial pits 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.

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 to comprise the Gunthorpe Member, described as red brown mudstone siltstone and sandstone. Superficial Deposits are recorded as the Bosworth Clay Member, described as clay and silt.
- 5.2. The trial pits excavated across the site revealed that deposits of made ground comprising predominantly granular soils can be found. Made ground deposits were being recorded overlaying deposits of the superficial Bosworth Clay Member. 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 0.28m (SA1) to 0.84m (SA3) as predominantly a loose gravelly, slightly silty fine to coarse sand, with gravel sized fragments of brick, quartz and hardcore.
- 5.4. **Bosworth Clay Member** – recorded beneath the made ground soils, to the base of all trial pits as a stiff to very stiff clay.
- 5.5. **Gunthorpe Member** – not encountered during this investigation.
- 5.6. No groundwater was encountered during excavation of the trial pits or the brief time they remained open, prior to infiltration testing.

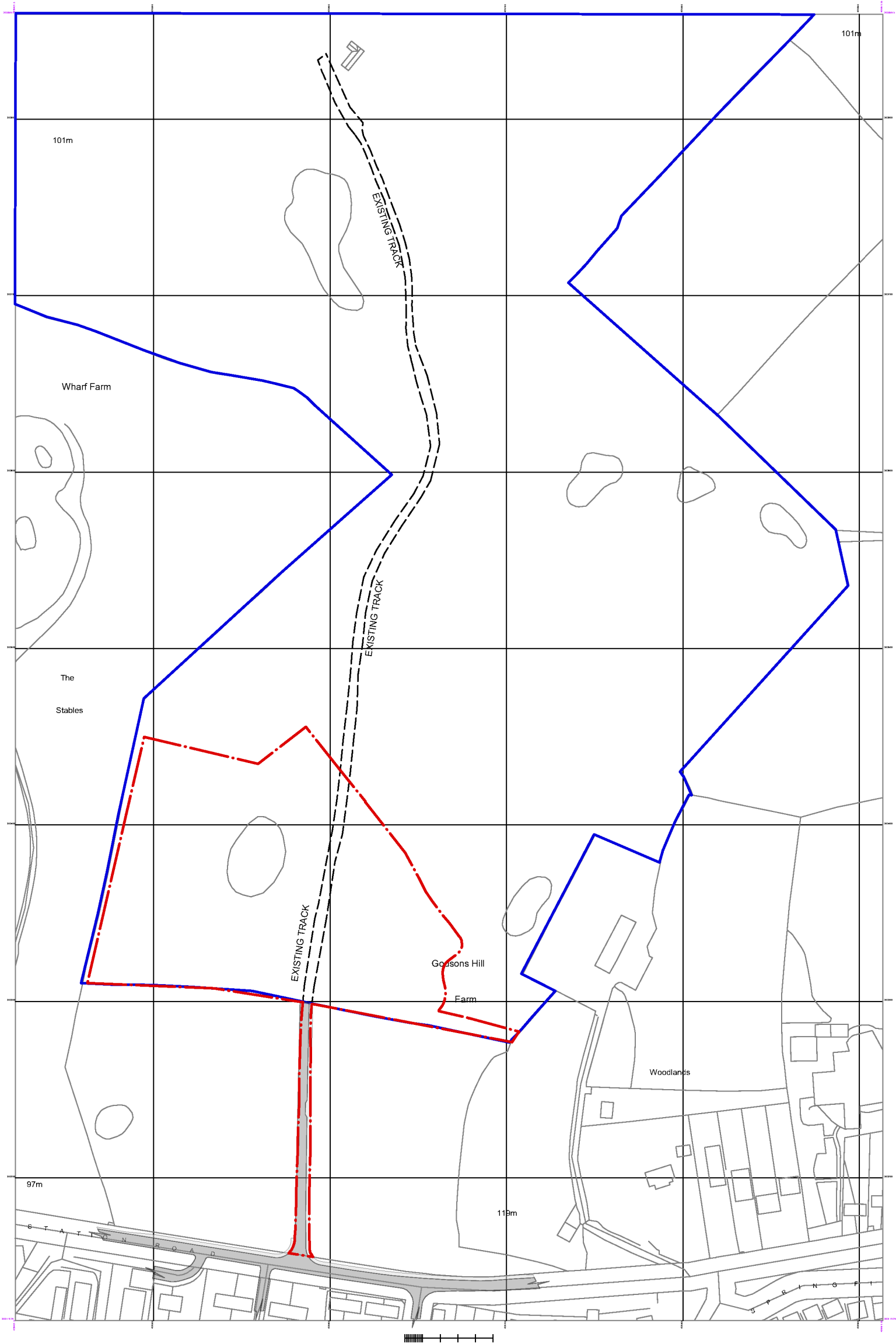
6. INFILTRATION TESTING ASSESSMENT AND RECOMMENDATIONS

- 6.1. Three infiltration tests (SA1-SA3), were undertaken, in line with BRE 365 guidelines, 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 tests were carried out within SA1-SA3 and were excavated through the made ground and Bosworth Clay Member to depths of 1.50m (SA1), 1.80m (SA2) and 2.00m (SA3). In summary water levels fell by 2cm over 240 minutes in SA1 and 3cm over 240 minutes in SA2 and SA3. Due to the negligible fall in water level, the strata encountered can be classified as practically impermeable, therefore, an alternative method of dealing with surface water drainage should be adopted.
- 6.3. A drainage strategy has been produced by Farrow Walsh Consulting (Ref: FW1219-D-401 dated September 2018). Reference should be made to this drainage strategy for the surface water drainage method to be adopted.

APPENDIX I

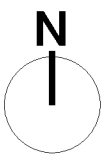
SITE PLANS

*Existing track location based upon topographical survey 02035-08-01 completed by SV Surveying



Project
Market
Bosworth
Golf Holiday
Chalet

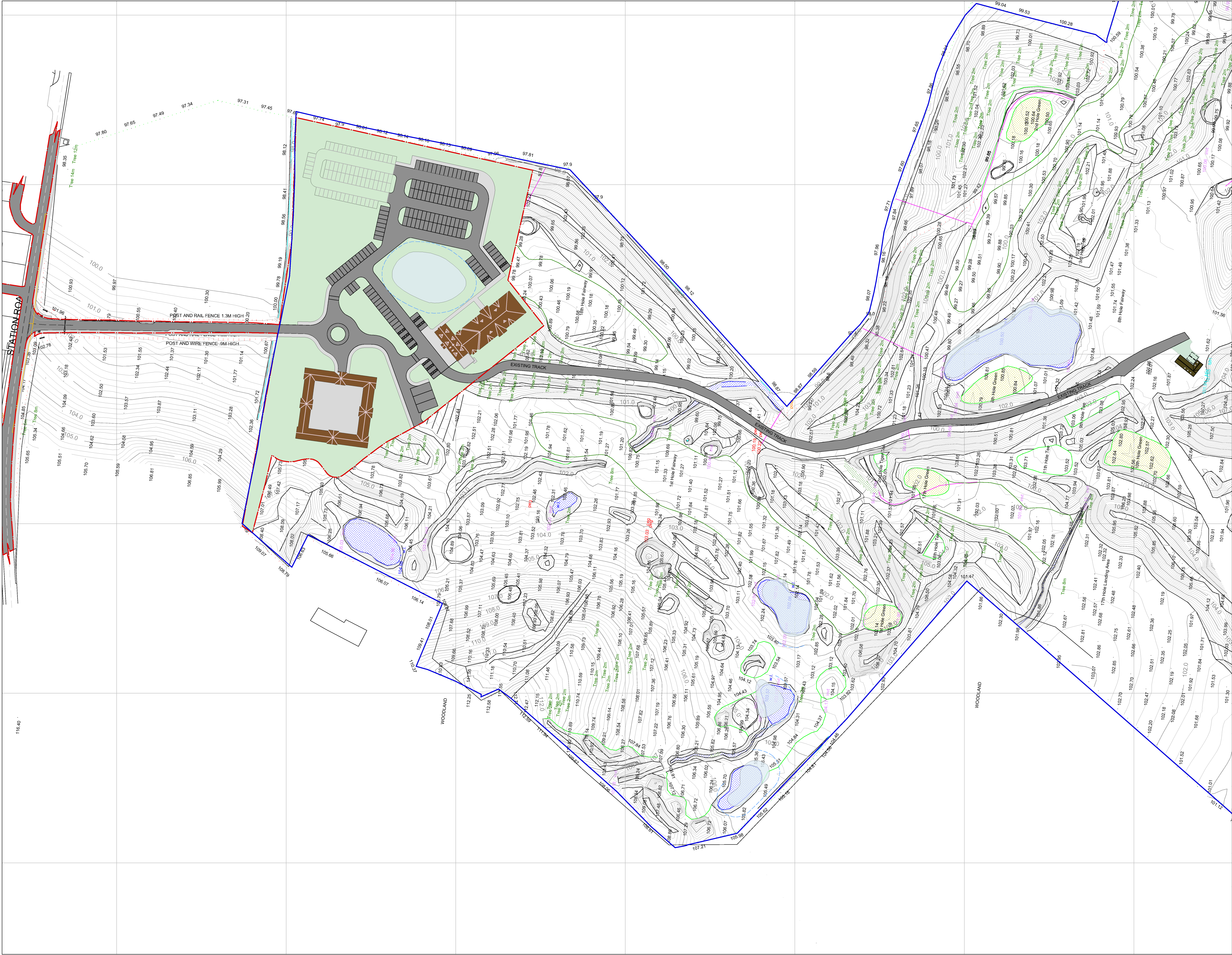
PLANNING
Drawing Title
Site location Plan



Date
26.11.19
Project Ref.
0196

Scale
1:2500@A3
Drawing No.
A-EL-003

Checked
AS
Revision
J



Notes

Measurements not to be scaled from this drawing. All dimensions to be checked and confirmed prior to commencement of work. Contractors to notify architects of site variations affecting information on this drawing. The information in this drawing is copyright of Hickman & Smith Architects Ltd.

Measurements are based on previous drawings provided by the client and as such the site boundary area is to be confirmed by the client.

Date	Rev	By	Details
20.04.18	/	DG	Issued for Client Comments
27.04.18	A	DG	Issued for Client Comments
30.04.18	B	DG	Issued for Client Comments
01.05.18	C	DG	Issued for Client Comments
24.05.18	D	DG	Issued for Client Comments
07.06.18	E	DG	Issued for Client Comments
23.07.18	F	DG	Issued for Client Comments
13.09.18	G	DG	Issued for Client Comments
08.10.18	H	DG	Issued for Client Comments
11.07.19	I	DG	Issued for Client Comments
20.11.19	J	DG	Issued for Client Comments
25.11.19	K	DG	Issued for Client Comments
26.11.19	L	DG	Issued for Client Comments

Location Key

PLANNING

Hickman & Smith Architects

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Project
Market Bosworth Golf Leisure and Country Club

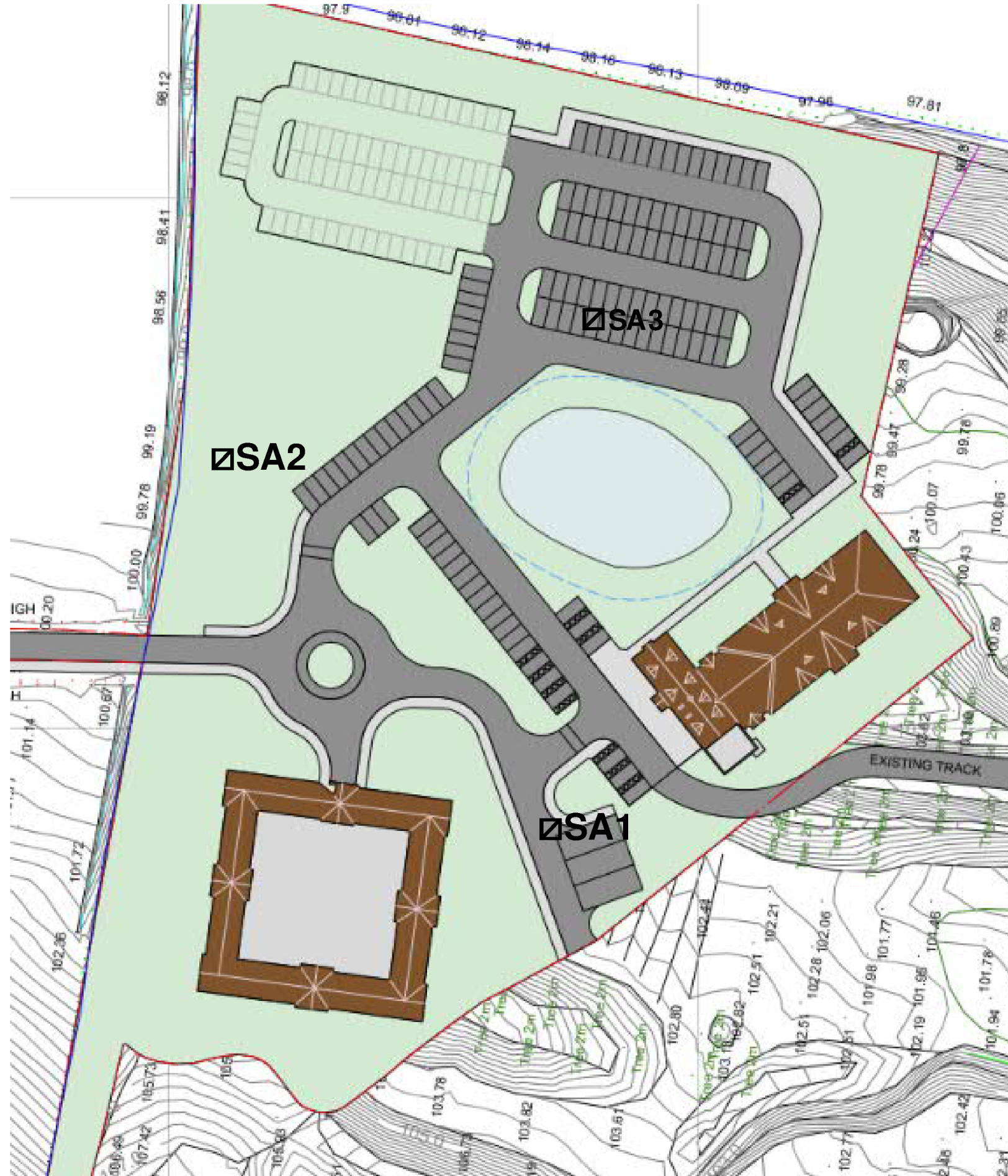
Client
Statue Homes Ltd

Drawing Title
Proposed Site Plan

Date	Scale	Checked
26.11.19	1:1000@A1 1:2000@A3	AS
Project Ref.	Drawing No.	Revision
0196	A-PL-001	L

APPENDIX II

TRIAL PIT LOCATION PLAN



APPENDIX III

TRIAL PIT LOGS

PRP environmental		Trial Pit Log									
Project Name: Kyngs Golf and Country Club					Client: Statue Homes Limited			Date: 24/02/2023			
Location: Market Bosworth					Contractor:						
Project No. : 82659					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							
					0.11			MADE GROUND. Loose dark grey brown, very gravely, slightly silty fine to coarse SAND. Gravel is fine to coarse, angular to sub-rounded hardcore. MADE GROUND. Loose brown, very gravely, slightly silty fine to coarse SAND. Gravel is fine to coarse, angular to sub-rounded hardcore and brick. Stiff to very stiff brown mottled with grey CLAY (Bosworth Clay Member).	1		
					0.28						
					1.50			End of Trial Pit at 1.500m	2		
									3		
									4		
									5		
Dimensions		Trench Support and Comment				Pumping Data					
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks			Date	Rate	Remarks		
		Sides stable throughout excavation									
Remarks											
1. No groundwater encountered. 2. Infiltration testing conducted, see separate sheet for details. 3. Trial pits backfilled upon completion.											

PRP environmental		Trial Pit Log									
Project Name: Kyngs Golf and Country Club				Client: Statue Homes Limited				Date: 24/02/2023			
Location: Market Bosworth				Contractor:							
Project No. : 82659				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							
					0.40			MADE GROUND. Loose dark brown, gravelly, slightly silty fine to coarse SAND. Gravel is fine to coarse, angular to sub-rounded brick, quartz and hardcore.	1		
								Stiff to very stiff brown mottled with grey CLAY (Bosworth Clay Member).			
					1.80			End of Trial Pit at 1.800m	2		
									3		
									4		
									5		
Dimensions		Trench Support and Comment				Pumping Data					
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks			Date	Rate	Remarks		
		Sides stable throughout excavation.									
Remarks											
1. No groundwater encountered. 2. Infiltration testing conducted, see separate sheet for details. 3. Trial pits backfilled upon completion.											

PRP environmental		Trial Pit Log									
Project Name: Kyngs Golf and Country Club				Client: Statue Homes Limited				Date: 24/02/2023			
Location: Market Bosworth				Contractor:							
Project No. : 82659				Crew Name:				Equipment: Excavator			
Location Number SA3		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							
					0.84			MADE GROUND. Loose dark brown, gravelly, slightly silty fine to coarse SAND. Gravel is fine to coarse, angular to sub-rounded brick, quartz and hardcore.	1		
					2.00			Stiff to very stiff brown mottled with grey CLAY (Bosworth Clay Member).	2		
							End of Trial Pit at 2.000m	3			
								4			
								5			
Dimensions		Trench Support and Comment				Pumping Data					
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks			Date	Rate	Remarks		
		Minor spalling throughout excavation.									
Remarks											
1. No groundwater encountered. 2. Infiltration testing conducted, see separate sheet for details. 3. Trial pits backfilled upon completion.											

APPENDIX IV

INFILTRATION TEST REPORTS



PRP

consulting civil & structural engineers

Leicester
0116
275 1710

Northampton
01604
889870

Huntingdon
01832
710959

SOIL INFILTRATION REPORT

Project No:

82659

Project:

Kyngs Golf Course

Prepared by:

DL

Checked by:

DE

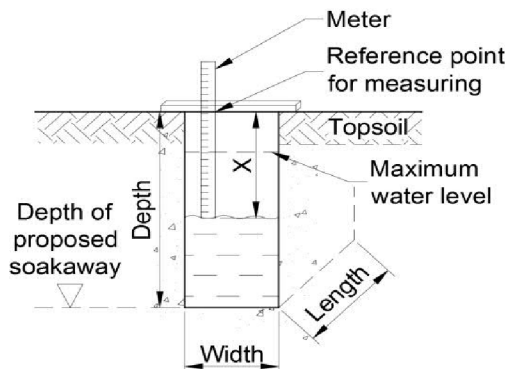
Sheet:

01

Permeability Test SA1

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

Borehole Size		
Length (m)	Width (m)	Depth (m)
3.00	0.65	1.50



		Site Readings		
No	Time (mins)	Time (hh:mm)	X - Ground to Water distance (m)	Level
1	0		0.65	
2	1		0.65	
3	2		0.65	
4	3		0.65	
5	4		0.65	
6	5		0.65	
7	10		0.65	
8	15		0.65	
9	20		0.65	
10	25		0.65	
11	30		0.66	
12	40		0.66	
13	50		0.66	
14	60		0.66	
15	70		0.66	
16	80		0.66	
17	90		0.66	
18	100		0.66	
19	110		0.67	
20	120		0.67	
21	130		0.67	
22	140		0.67	
23	150		0.67	
24	180		0.67	
25	210		0.67	
26	240		0.67	
27				

Negligible fall in water. Strata classified as practically impermeable



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Project:

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Prepared by:

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Checked by:

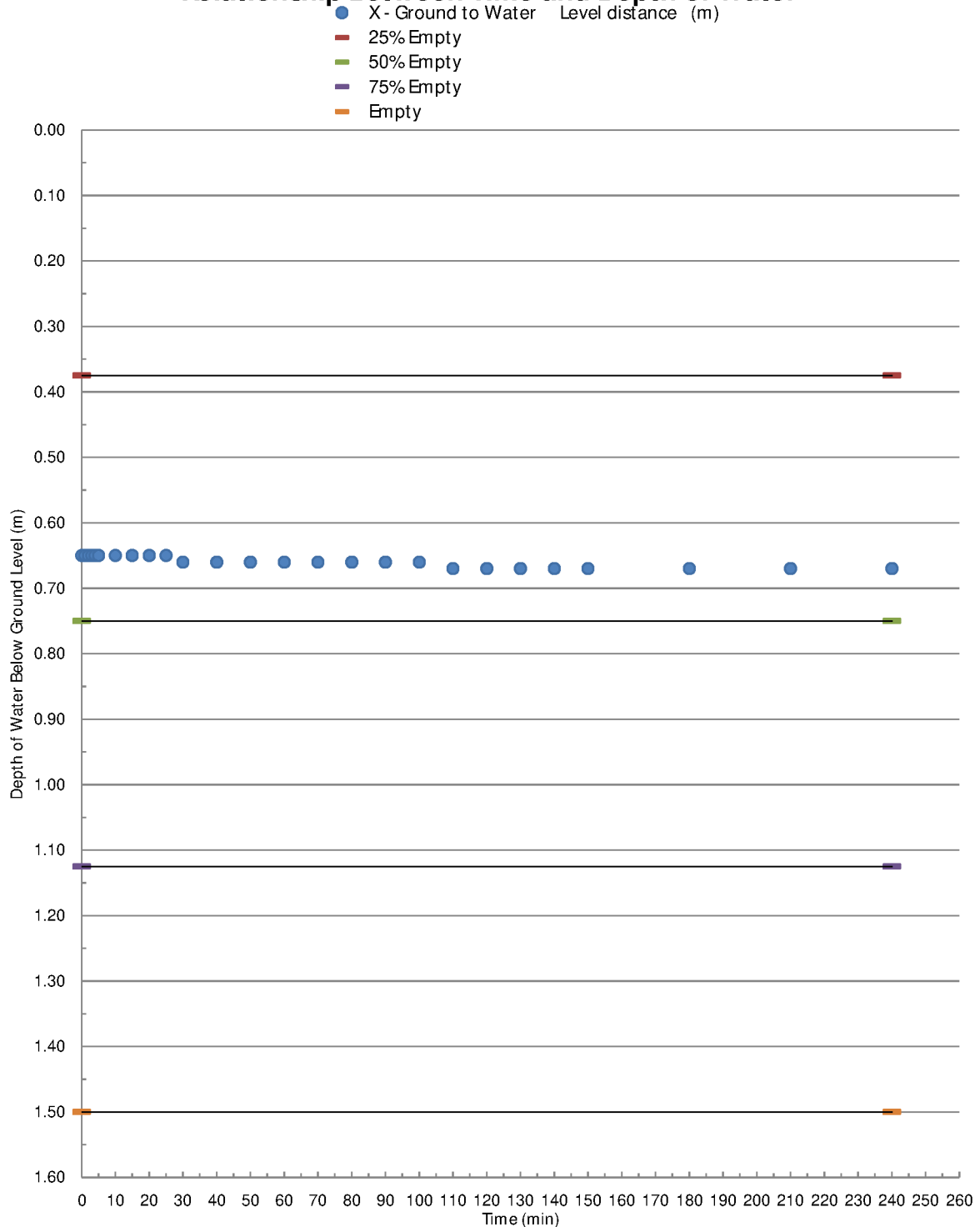
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Sheet:

02

Permeability Test SA1

Relationship Between Time and Depth of Water





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Project No:

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Project:

Kyngs Golf Course

Prepared by:

DL

Checked by:

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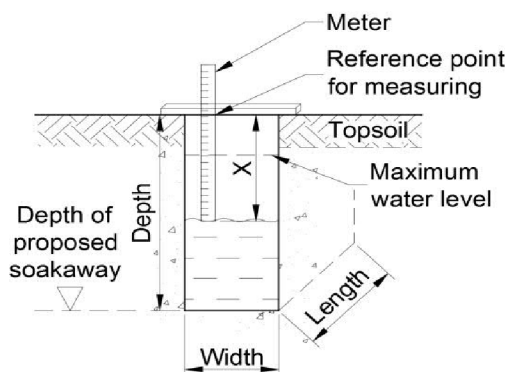
Sheet:

01

Permeability Test SA2

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

Borehole Size		
Length (m)	Width (m)	Depth (m)
2.89	0.63	1.80



		Site Readings		
No	Time (mins)	Time (hh:mm)	X - Ground to Water distance (m)	Level
1	0		0.70	
2	1		0.70	
3	2		0.70	
4	3		0.70	
5	4		0.71	
6	5		0.71	
7	10		0.71	
8	15		0.71	
9	20		0.71	
10	25		0.71	
11	30		0.71	
12	40		0.71	
13	50		0.72	
14	60		0.72	
15	70		0.72	
16	80		0.72	
17	90		0.72	
18	100		0.73	
19	110		0.73	
20	120		0.73	
21	130		0.73	
22	140		0.73	
23	150		0.73	
24	180		0.73	
25	210		0.73	
26	240		0.73	
27				

Negligible fall in water. Strata classified as practically impermeable



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SOIL INFILTRATION REPORT

Project No:

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Project:

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Prepared by:

DL

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Checked by:

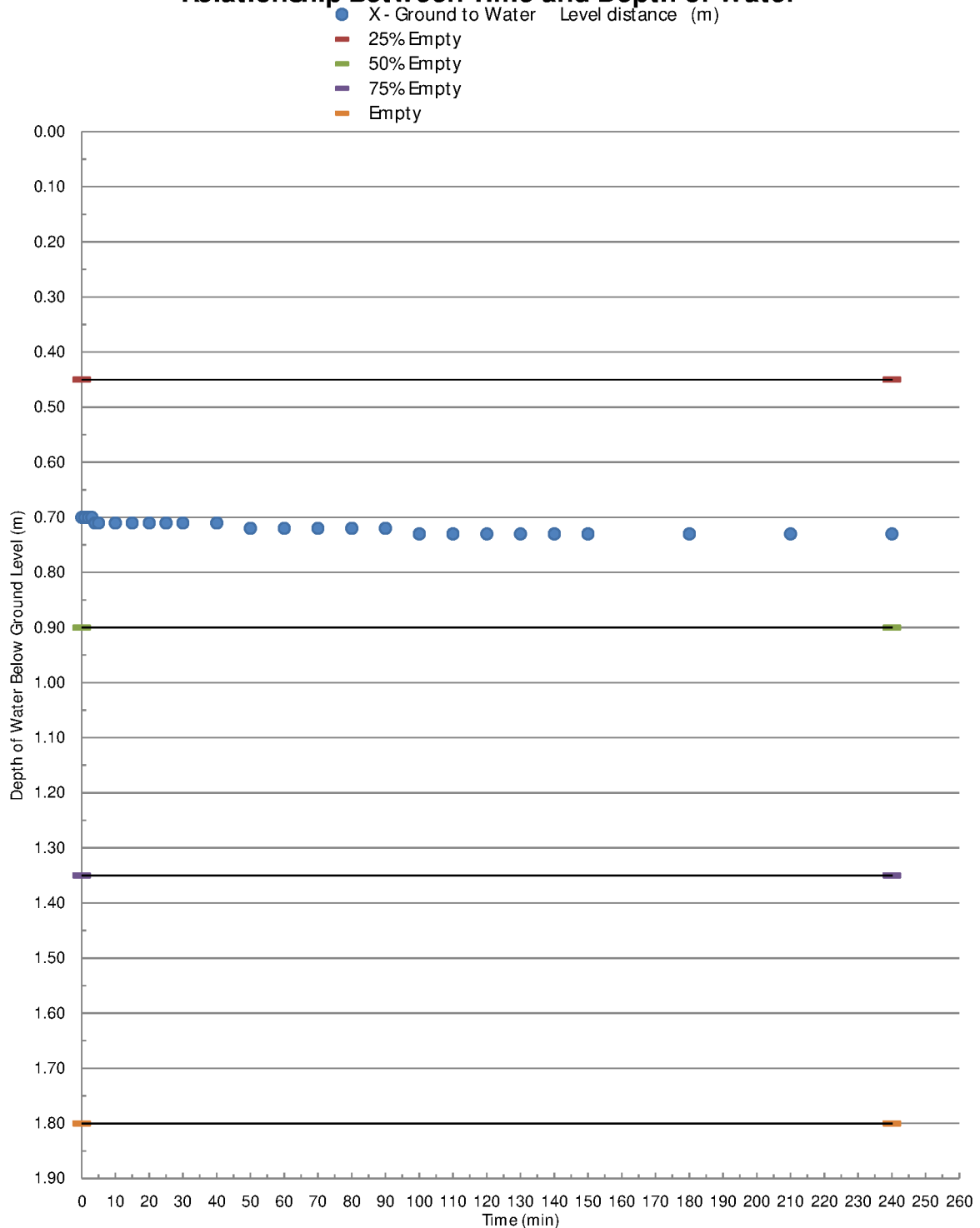
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02

Permeability Test SA2

Relationship Between Time and Depth of Water





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SOIL INFILTRATION REPORT

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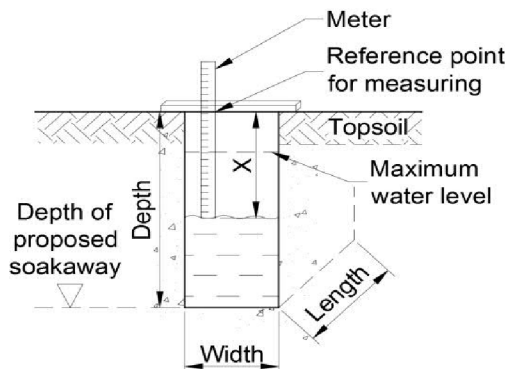
Sheet:

01

Permeability Test SA3

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

Borehole Size		
Length (m)	Width (m)	Depth (m)
3.15	0.72	2.00



		Site Readings		
No	Time (mins)	Time (hh:mm)	X - Ground to Water distance (m)	Level
1	0		0.97	
2	1		0.97	
3	2		0.97	
4	3		0.97	
5	4		0.97	
6	5		0.98	
7	10		0.98	
8	15		0.98	
9	20		0.99	
10	25		0.99	
11	30		0.99	
12	40		0.99	
13	50		0.99	
14	60		0.99	
15	70		0.99	
16	80		0.99	
17	90		0.99	
18	100		0.99	
19	110		0.99	
20	120		0.99	
21	130		0.99	
22	140		0.99	
23	150		0.99	
24	180		0.99	
25	210		1.00	
26	240		1.00	
27				

Negligible fall in water. Strata classified as practically impermeable



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SOIL INFILTRATION REPORT

Project No:

82659

Project:

Kyngs Golf Course

Prepared by:

DL

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Checked by:

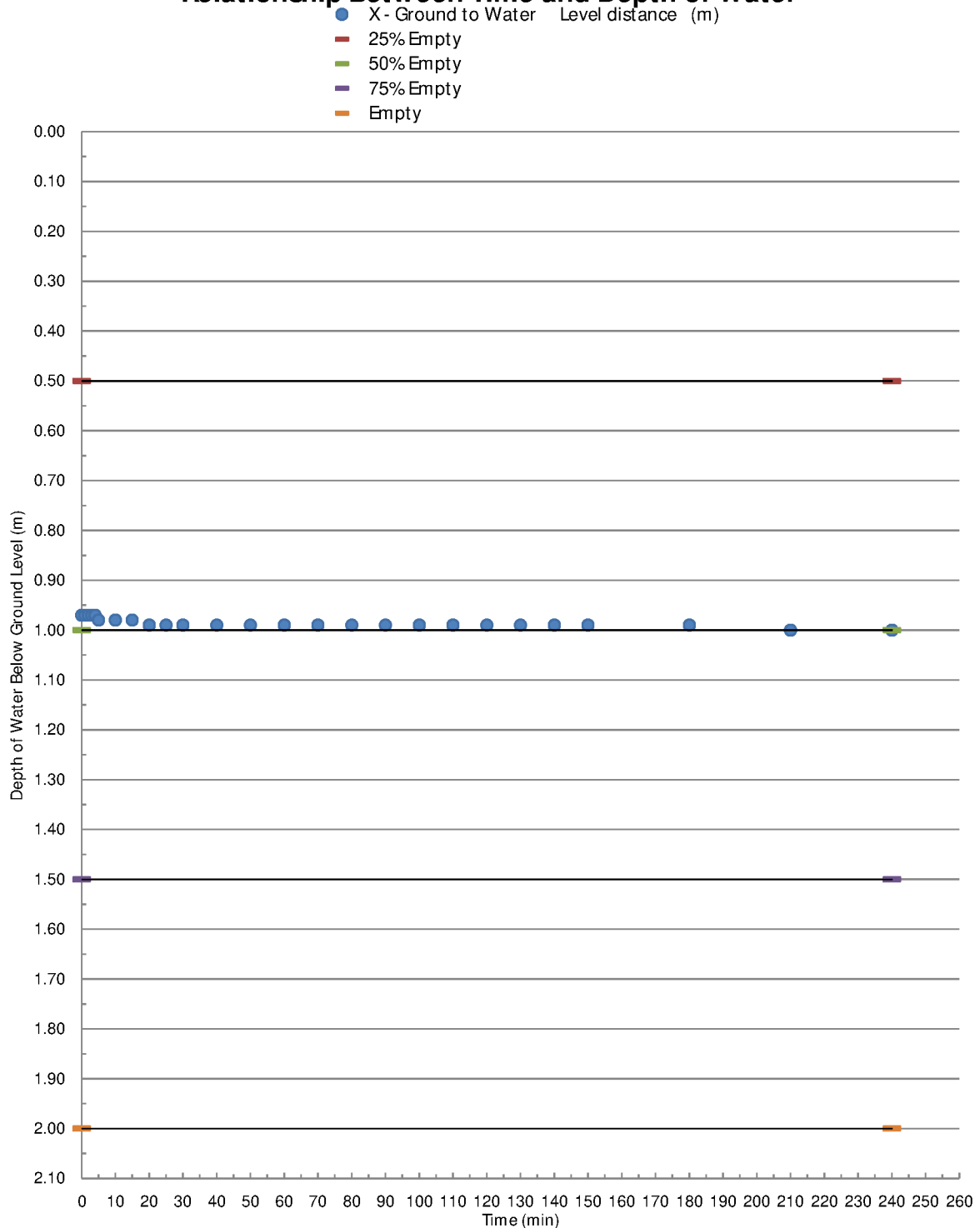
DE

Sheet:

02

Permeability Test SA3

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.
12. The copyright in this report and other related plans and documents prepared by PRP is owned by them and no such report, plan or document may be reproduced, published or adapted without their written consent. Complete copies of the report may however be made and distributed by the client as an expedient in dealing with matters related to its commission.
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.

APPENDIX VI

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