A REPORT ON A GROUND INVESTIGATION AT MELDRETH STATION, MELDRETH, SG8 6JR (FACTUAL)

CLIENT: Station Yard Meldreth Limited

ENGINEER: MTC Engineering (Cambridge) Limited

Date: 25 July 2017

Reference: ADB/17.265

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CONTENTS

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1. INTRODUCTION

It is proposed to carry out residential development at a site off Station Road, Meldreth, SG8 6JR (drawing 17.265/1).

At the instruction of the Client, an investigation has been undertaken to provide an assessment of the ground conditions and the infiltration characteristics of the shallow soil to aid the drainage design for the proposed development.

This report provides the factual details of the fieldwork undertaken during the investigation.

2. FIELDWORK

The fieldwork was carried out on 19 and 20 July 2017, and comprised three machine excavated trial pits with subsequent soakage testing referenced TP01 to TP03.

The locations of the positions were set out in general accordance with the requirements of the Client, as indicated on drawing 17.265/2.

A cable avoidance tool (CAT) was used to sweep the location of each position and the immediate surrounding area to locate any potential services, and the positions adjusted as necessary.

Soils were described in general accordance with BS EN 1997-2:2007 Eurocode 7 and its UK National Annex supported by BS 5930:2015.

The trial pits were excavated by a wheeled JCB 3CX excavator and taken to a depth of 2.00 m using a 0.45 m wide bucket. The initial hardstanding was broken out using a hydraulic breaker attachment to the excavator. No groundwater was encountered during excavation of the trial pits.

To facilitate soakage testing and maintain the test section, the trial pits were filled with 20 mm diameter gravel between 1.00 and 2.00 m depth with temporary monitoring pipes also installed. The tests were carried out in accordance with Building Research Establishment report 365 (BRE, 2016) by filling the test section with water and recording the time taken for it to drain away. In addition to manual dipping, data loggers were installed to record the level of the water outside normal working hours.

The trial pit records and infiltration test results are appended to this report.

Details of the strata encountered, the sampling and *in situ* testing are shown on records appended to this report.

[redacted]
BSc (Hons) FGS

[redacted]
MSc PhD DIC CEng FIMMM CGeol FGS

A F HOWLAND ASSOCIATES
25 July 2017

APPENDIX A: REFERENCES

BUILDING RESEARCH ESTABLISHMENT. 2016. BRE Digest 365: Soakaway design. Building Research Establishment, London.

BRITISH STANDARDS INSTITUTION. 2015. BS 5930:2015 Code of practice for ground investigations. British Standards Institution. London.

BRITISH STANDARDS INSTITUTION. 2007. Eurocode 7 – Geotechnical Design. Part 2: Ground investigation and testing. British Standards Institution. London.

APPENDIX B: TRIAL PIT AND SOAKAGE TEST RECORDS

D Small disturbed sample

All depths and measurements are given in metres, except as noted

Strata descriptions compiled by visual examination of samples obtained after BS 5930:2015 and modified in accordance with laboratory test results where applicable

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Site Meldreth Station, Station Rd, Meldreth, SG8 6JR			**Trial Pit Number** TP01
Excavation Method JCB 3CX Wheeled Excavator	**Dimensions** 1.80 m L x 0.45 m W x 2.00 m D	**Ground Level (mOD)**	**Client** Station Yard Meldreth Limited	**Job Number** 17.265
	Location	**Dates** 19/07/2017-20/07/2017	**Engineer** MTC Engineering (Cambridge) Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1				(0.50)	Tarmac/Concrete over Made Ground (dark grey gravelly sand with many fragments of tarmac and concrete)		
0.50-0.75	D2				0.50 (0.25)	Made Ground (soft to firm grey sandy chalky slightly gravelly clay. Gravel is fine to medium chalk)		
0.75-1.10	D3				0.75 (0.35)	Soft to firm dark greyish brown sandy slightly gravelly CLAY. Gravel is subangular fine to medium chalk		
1.10-2.00	D4				1.10 (0.90)	Structureless CHALK, recovered as silt size matrix with gravel size fragments of very weak chalk		
					2.00	Complete at 2.00m		

No Image available

Remarks

1. Location CAT scanned prior to excavation.
2. Plastic 150 mm diameter pipe broken at 0.60 m depth. Client informed and confirmed it was redundant.
3. No groundwater encountered
4. Trial Pit remained open and sidewalls stable during excavation
5. Pit backfilled with gravel to 1.0 m and then arisings to surface
6. Soakage test performed between 1.0 m and 2.0 m

Scale (approx)	Logged By	Figure No.
1:25	ADB	17.265.TP01

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Soakage Test (BRE Digest 365)

Site : Meldreth Station, Station Rd, Meldreth, SG8 6JR

Client : Station Yard Meldreth Limited

Engineer: MTC Engineering (Cambridge) Limited

Job Number 17.265

Sheet 1 / 1

Location	Date	Level	Location
TP01	19/07/2017		

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	1.80

Soil type at test level	Dark greyish brown sandy slightly gravelly CLAY over structureless CHALK
Groundwater	Not encountered
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone Filled

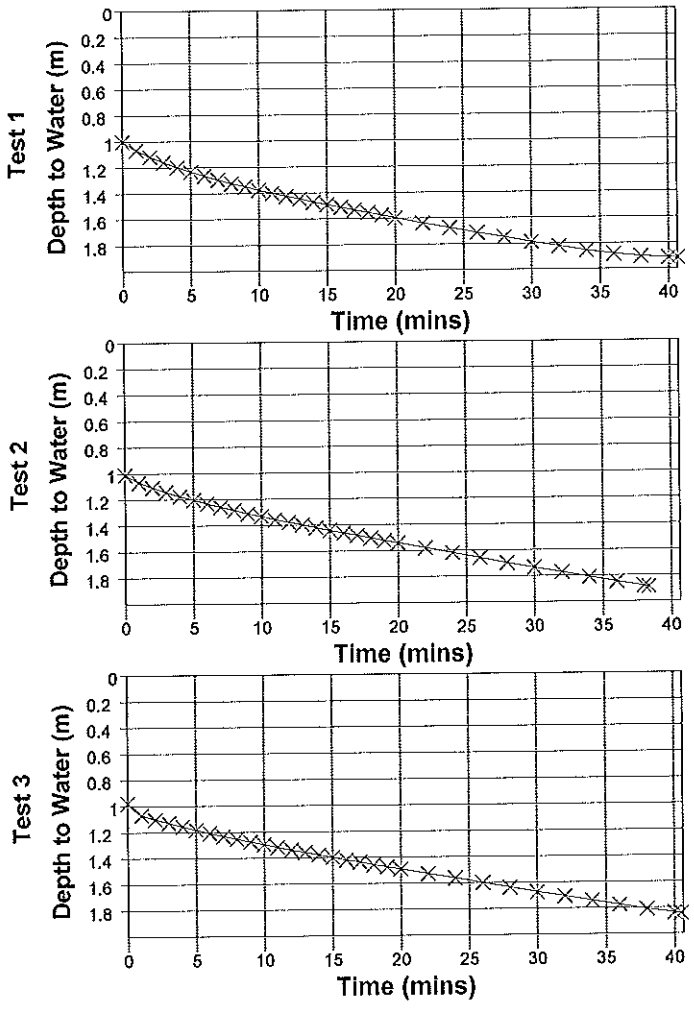
	1	2	3
Effective depth (m)	1.00	0.99	1.02
Volume outflowing between 75% & 25% (m3)*	0.12	0.12	0.12
Mean surface area through which outflow occurs (m2)	3.06	3.04	3.11
Time for outflow between 75% & 25% (min)	22.48	23.87	27.09
SOIL INFILTRATION RATE (ms-1), f	2.94E-5	2.76E-5	2.45E-5

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 10226020
4. Test 1 and 2 undertaken on 19/07/17 whilst test 3 undertaken on 20/07/17

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1	Depth to Water Test 2	Depth to Water Test 3
0	1.003	1.013	0.979
1	1.068	1.07	1.072
2	1.119	1.11	1.104
3	1.161	1.144	1.131
4	1.20	1.177	1.159
5	1.235	1.206	1.184
6	1.266	1.234	1.21
7	1.297	1.261	1.234
8	1.326	1.286	1.255
9	1.351	1.312	1.277
10	1.378	1.335	1.299
11	1.402	1.358	1.32
12	1.426	1.379	1.342
13	1.447	1.40	1.36
14	1.473	1.422	1.38
15	1.492	1.444	1.40
16	1.513	1.464	1.421
17	1.535	1.484	1.437
18	1.555	1.504	1.459
19	1.576	1.525	1.476
20	1.598	1.544	1.493
22	1.639	1.583	1.53
24	1.675	1.621	1.564
26	1.715	1.66	1.601
28	1.75	1.701	1.638
30	1.788	1.738	1.675
32	1.823	1.775	1.709
34	1.856	1.812	1.743
36	1.885	1.849	1.777
38	1.905	1.883	1.811
38.333		1.889	
40	1.915		1.84
40.5			1.845
40.667	1.918		



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Excavation Method JCB 3CX Wheeled Excavator	**Dimensions** 1.80 m L x 0.45 m W x 2.00 m D	**Ground Level (mOD)**	**Site** Meldreth Station, Station Rd, Meldreth, SG8 6JR	**Trial Pit Number** TP02
			Client Station Yard Meldreth Limited	**Job Number** 17.265
	Location	**Dates** 19/07/2017- 20/07/2017	**Engineer** MTC Engineering (Cambridge) Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1				(0.50)	Tarmac/Concrete over Made Ground (dark grey gravelly sand with many fragments of tarmac and concrete)		
0.50-0.75	D2				0.50 (0.25)	Dark grey slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded flint		
0.75-2.00	D3				0.75 (1.25)	Grey mottled brown structureless CHALK, recovered as very weak gravel size fragments of chalk in a silt size matrix		
					2.00	Complete at 2.00m		

No image available

Remarks

1. Location CAT scanned prior to excavation.
2. No groundwater encountered
3. Trial Pit remained open and sidewalls stable during excavation
4. Pit backfilled with gravel to 1.0 m and then arisings to surface
5. Soakage test performed between 1.0 m and 2.0 m

Scale (approx)	Logged By	Figure No.
1:25	ADB	17.265.TP02

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Soakage Test (BRE Digest 365)

Site : Meldreth Station, Station Rd, Meldreth, SG8 6JR

Client : Station Yard Meldreth Limited

Engineer: MTC Engineering (Cambridge) Limited

Job Number 17.265

Sheet 1 / 1

Location	Date	Level	Location
TP02	19/07/2017		

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	1.80

Soil type at test level	Structureless CHALK
Groundwater	Not encountered
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone Filled

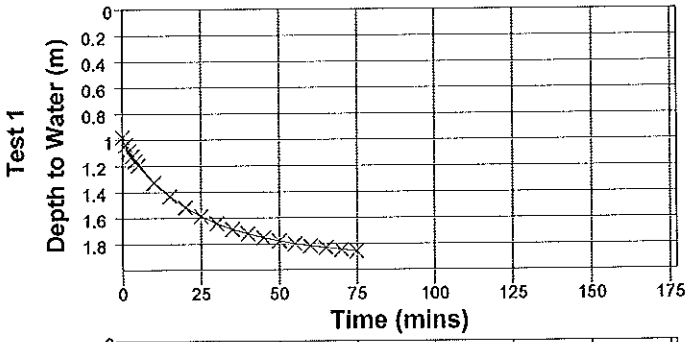
	1	2	3
Effective depth (m)	1.02	1.04	1.03
Volume outflowing between 75% & 25% (m3)*	0.12	0.13	0.13
Mean surface area through which outflow occurs (m2)	3.11	3.15	3.13
Time for outflow between 75% & 25% (min)	37.22	44.46	46.48
SOIL INFILTRATION RATE (ms-1), f	1.78E-5	1.50E-5	1.43E-5

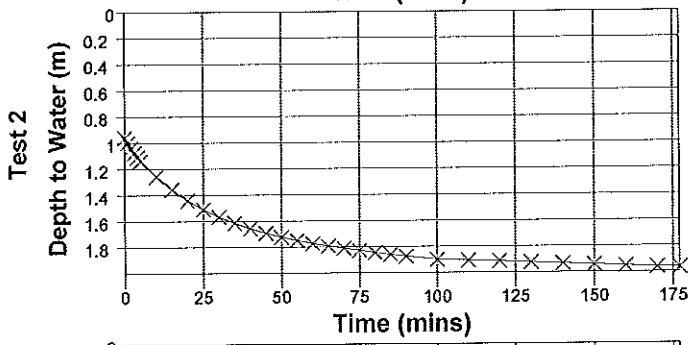
Remarks

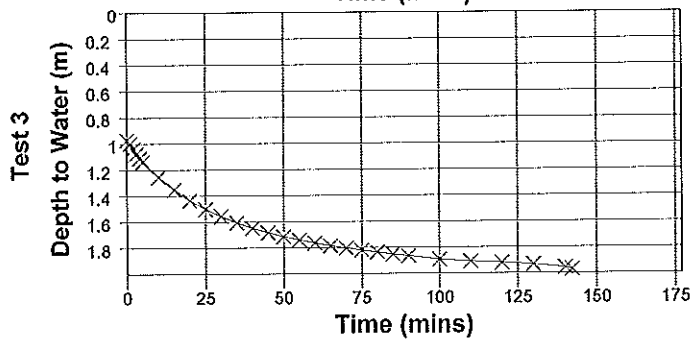
1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 11186010
4. Tests 1 and 2 undertaken on 19/07/17 whilst test 3 undertaken on 20/07/17

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1	Depth to Water Test 2	Depth to Water Test 3
0	0.98	0.961	0.973
1	1.037	1.001	1.00
2	1.085	1.041	1.041
3	1.126	1.078	1.078
4	1.163	1.11	1.113
5	1.195	1.14	1.141
10	1.329	1.259	1.258
15	1.434	1.359	1.354
20	1.519	1.443	1.436
25	1.587	1.511	1.503
30	1.643	1.57	1.558
35	1.688	1.618	1.608
40	1.722	1.66	1.65
45	1.753	1.695	1.685
50	1.778	1.726	1.716
55	1.80	1.751	1.742
60	1.817	1.775	1.765
65	1.831	1.795	1.787
70	1.846	1.813	1.805
74.833	1.858		
75		1.829	1.821
80		1.845	1.836
85		1.86	1.852
90		1.875	1.866
100		1.901	1.894
110		1.909	1.91
120		1.914	1.92
130		1.925	1.933
140		1.934	1.958
142.167			1.97
150		1.943	
160		1.954	
170		1.962	
177.167		1.968	







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Excavation Method JCB 3CX Wheeled Excavator	**Dimensions** 1.80 m L x 0.45 m W x 2.00 m D	**Ground Level (mOD)**	**Site** Meldreth Station, Station Rd, Meldreth, SG8 6JR
	Location	**Dates** 19/07/2017- 20/07/2017	**Client** Station Yard Meldreth Limited
			Engineer MTC Engineering (Cambridge) Limited

Trial Pit Number: TP03
Job Number: 17.265
Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1				(0.50)	Tarmac/Concrete over Made Ground (dark grey gravelly sand with many fragments of tarmac and concrete)		
0.50-1.10	D2				0.50 (0.60)	Made Ground (soft to firm dark grey mottled brown slightly sandy chalky clay)		
1.10-2.00	D3				1.10 (0.90)	Soft to firm grey chalky gravelly CLAY. Gravel is subangular to subrounded fine to medium chalk		
					2.00	Complete at 2.00m		

No Image available

Remarks

1. Location CAT scanned prior to excavation.
2. No groundwater encountered
3. Trial Pit remained open and sidewalls stable during excavation
4. Pit backfilled with gravel to 1.0 m and then arisings to surface
5. Soakage test performed between 1.0 m and 2.0 m

Scale (approx)	Logged By	Figure No.
1:25	ADB	17.265.TP03

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Soakage Test (BRE Digest 365)

Site : Meldreth Station, Station Rd, Meldreth, SG8 6JR

Client : Station Yard Meldreth Limited

Engineer: MTC Engineering (Cambridge) Limited

Job Number: 17.265

Sheet: 1 / 1

Location	Date	Level	Location
TP03	19/07/2017		

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	1.80

Soil type at test level	MADE GROUND over chalky gravelly CLAY
Groundwater	Not encountered
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone Filled

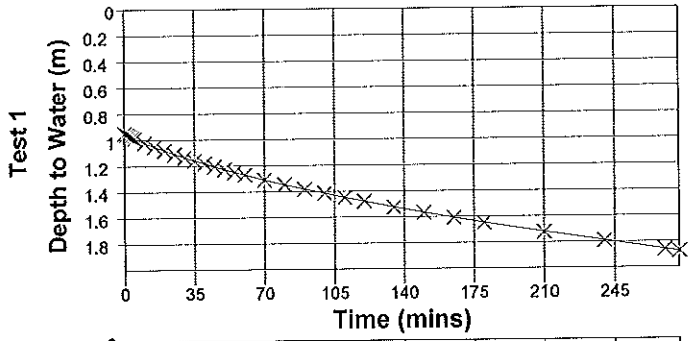
	1	2
Effective depth (m)	1.05	1.01
Volume outflowing between 75% & 25% (m3)*	0.13	0.12
Mean surface area through which outflow occurs (m2)	3.17	3.08
Time for outflow between 75% & 25% (min)	170.05	165.50
SOIL INFILTRATION RATE (ms-1), f	3.94E-6	4.01E-6

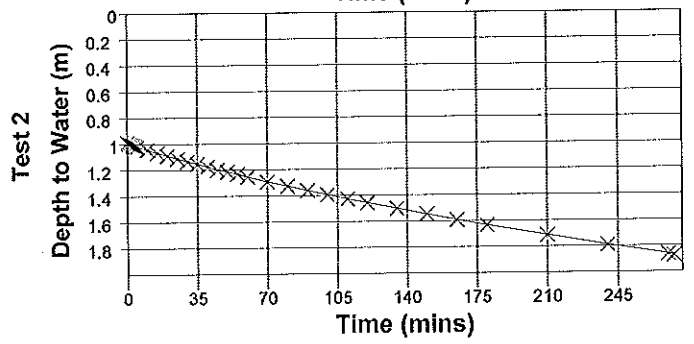
Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 12816060
4. Test 1 undertaken on 19/07/17 whilst test 2 undertaken on 20/07/17
5. Test 3 not undertaken due to time constraints in agreement with the Client

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

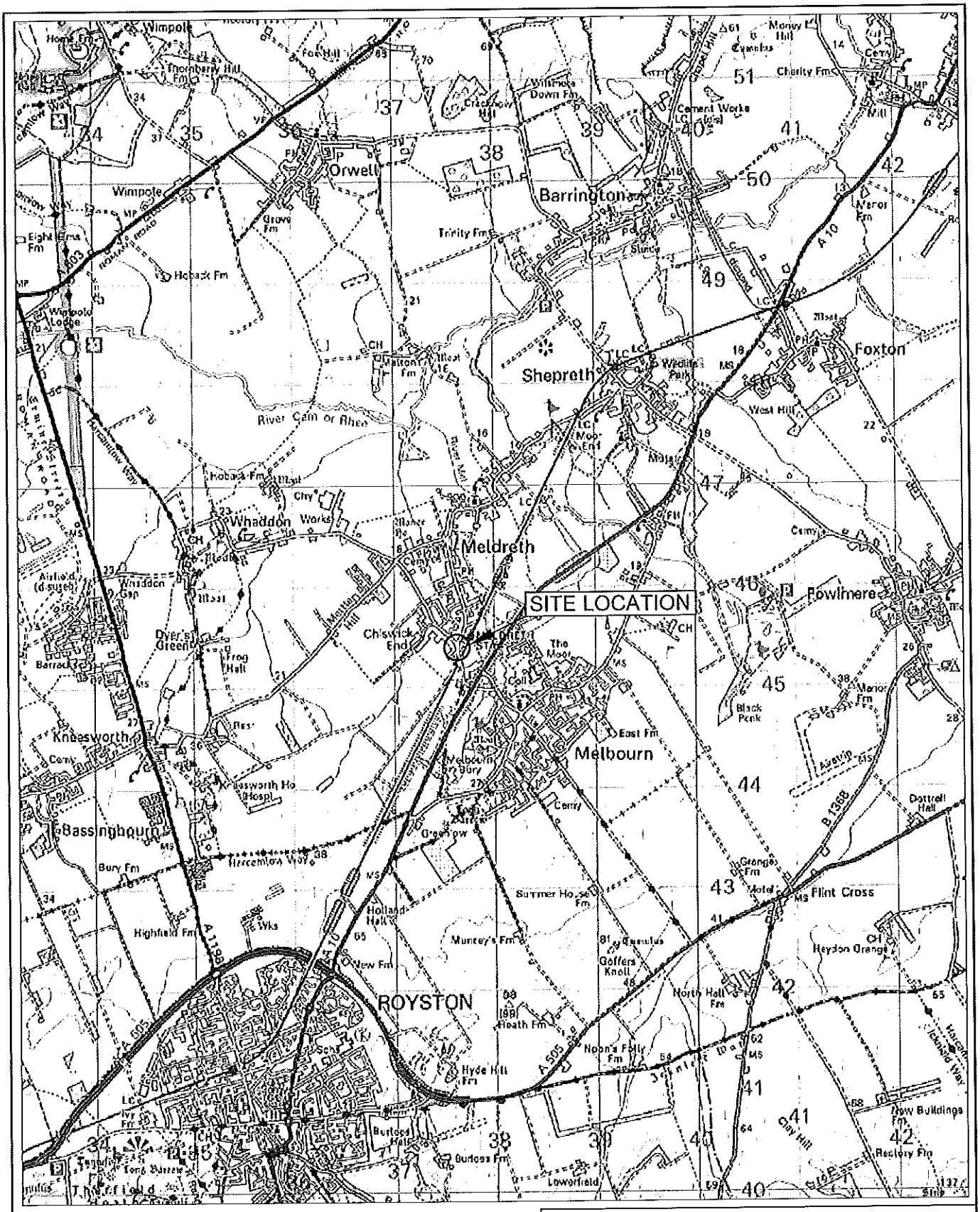
Elapsed time (mins)	Depth to Water Test 1	Depth to Water Test 2
0	0.95	0.991
1	0.961	0.998
2	0.969	1.004
3	0.974	1.009
4	0.982	1.015
5	0.989	1.02
10	1.024	1.045
15	1.054	1.069
20	1.082	1.092
25	1.11	1.113
30	1.136	1.135
35	1.16	1.155
40	1.183	1.177
45	1.207	1.20
50	1.229	1.217
55	1.251	1.234
60	1.271	1.256
70	1.312	1.295
80	1.349	1.328
90	1.384	1.363
100	1.415	1.395
110	1.451	1.43
120	1.48	1.46
135	1.526	1.505
150	1.568	1.549
165	1.609	1.594
180	1.649	1.636
210	1.723	1.715
240	1.792	1.793
270	1.861	1.865
272.833		1.876
277.167	1.876	





APPENDIX C: DRAWINGS

Drawing 17.265/1	Site Location Plan
Drawing 17.265/2	Exploratory Hole Location Plan



North

Circle indicates approximate location of site

Scale 1: 50,000 @ A4

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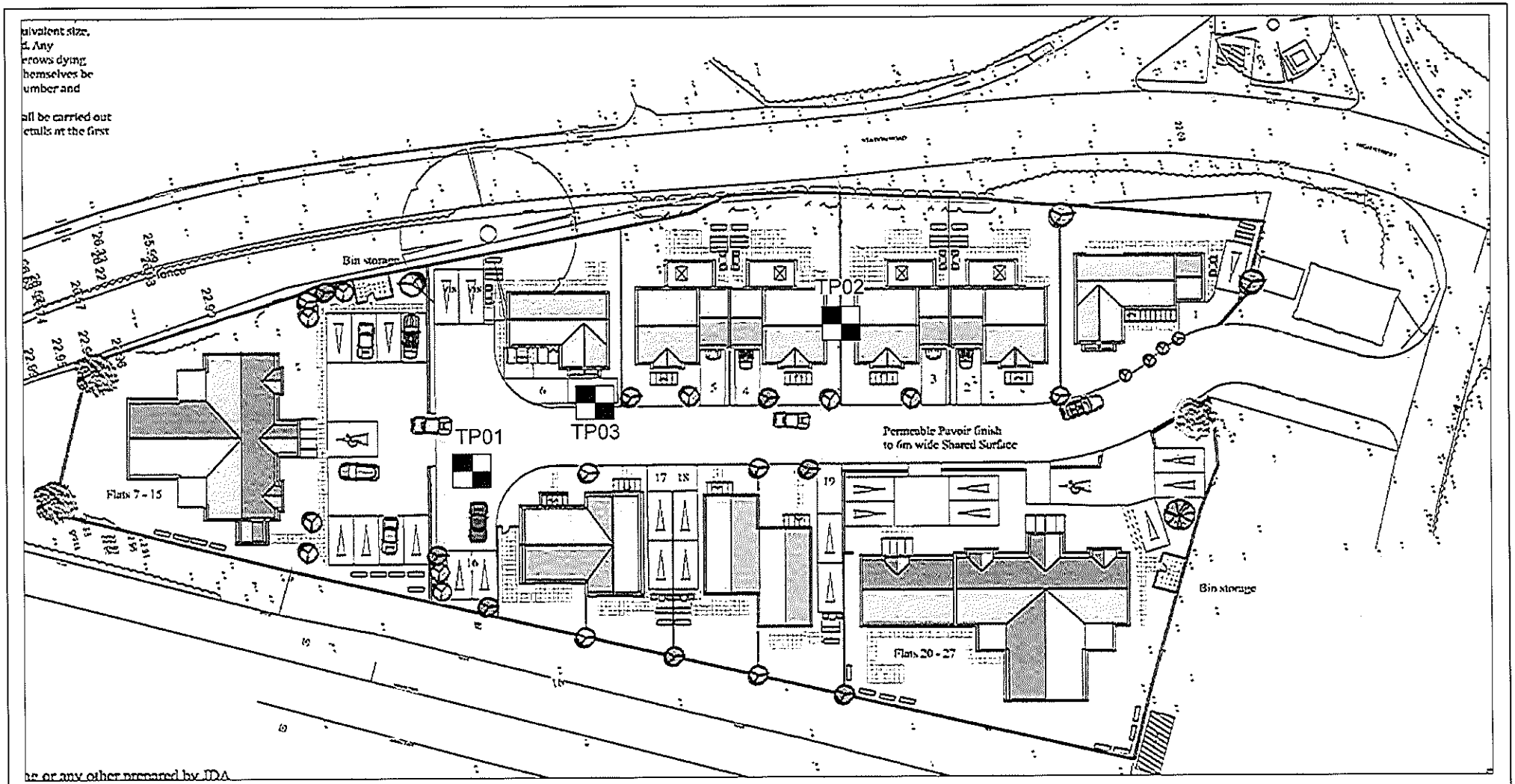
Site: Meldreth Station, Meldreth, SG8 6JR

SITE LOCATION PLAN

Client : Station Yard Meldreth Limited

Date : July 2017 **Dwg :** 17.265/1



North

Approximate trial pit location and reference

Scale Not to Scale at A4

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Site: Meldreth Station, Meldreth, SG8 6JR

EXPLORATORY HOLE LOCATION PLAN

Client : Station Yard Meldreth Limited

Date : July 2017 **Dwg :** 17.265/2

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