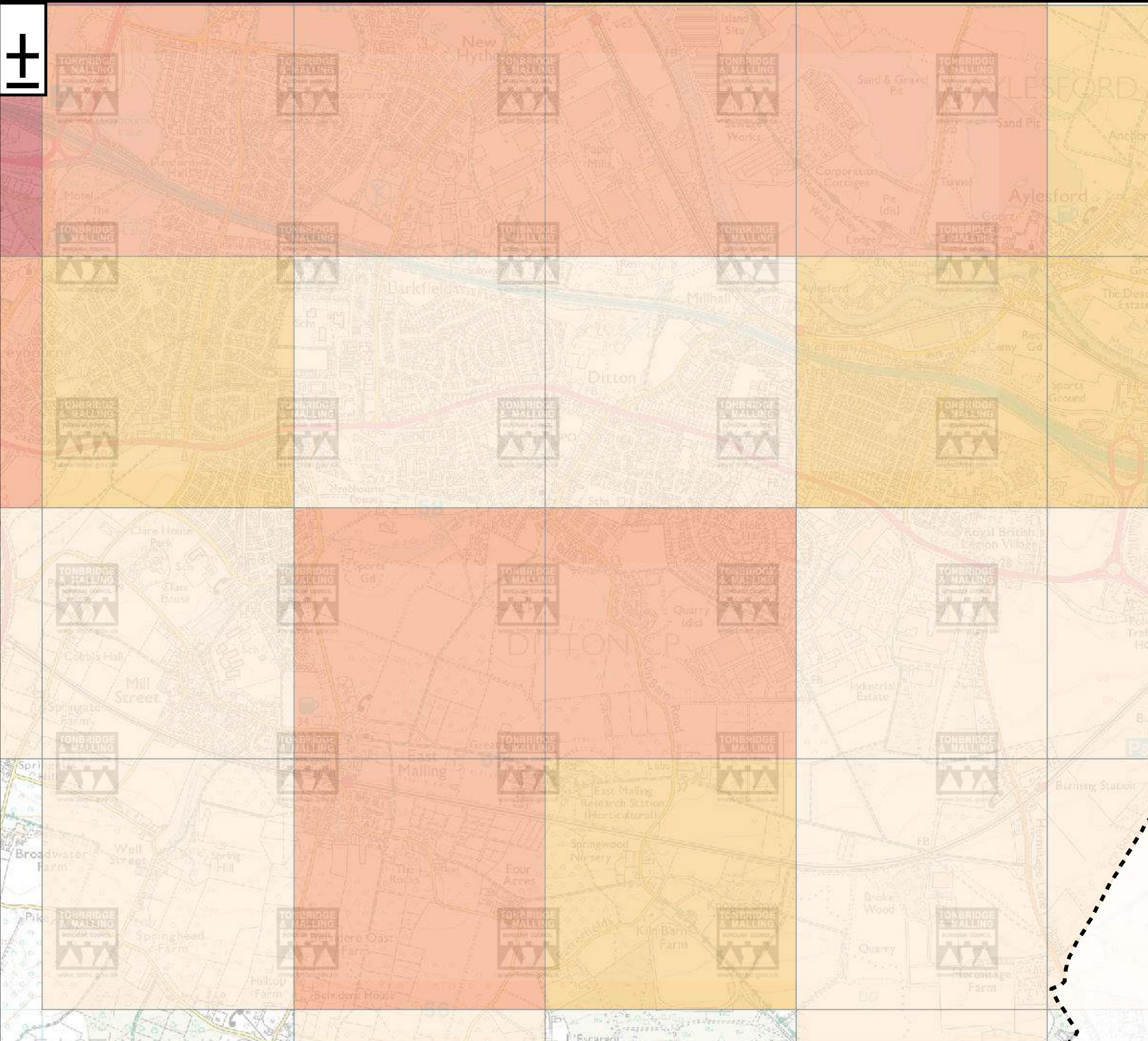


Appendix E
Strategic Flood Risk Assessment Mapping



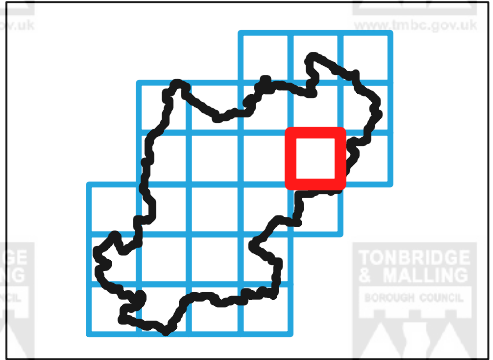
Notes

The Areas Susceptible to Groundwater Flooding (ASGW) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The ASGW data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

Key Plan



Legend

Tonbridge & Malling Borough boundary

Areas Susceptible to Groundwater Flooding

- No risk
- < 25%
- >= 25% < 50%
- >= 50% < 75%
- >= 75%

0 0.25 0.5 1
km

REF	Date	Comments
A	June 2016	-
B		
C		

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TONBRIDGE & MALLING BOROUGH COUNCIL LEVEL 1 SFRA: APPENDIX F GROUNDWATER FLOOD MAPS

Sheet No: 12 of 26 Index Number: TMBC_12

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Appendix F
Borehole Logs

A.G. WEEKS & PARTNERS

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

MELBOURNE HOUSE PEEL STREET
MAIDSTONE KENT ME14 2SD
TEL MAIDSTONE (0822) 872445

Project

EAST MALLING

RESEARCH STATION

Job No

1189.78/467

Sheet of

Made By

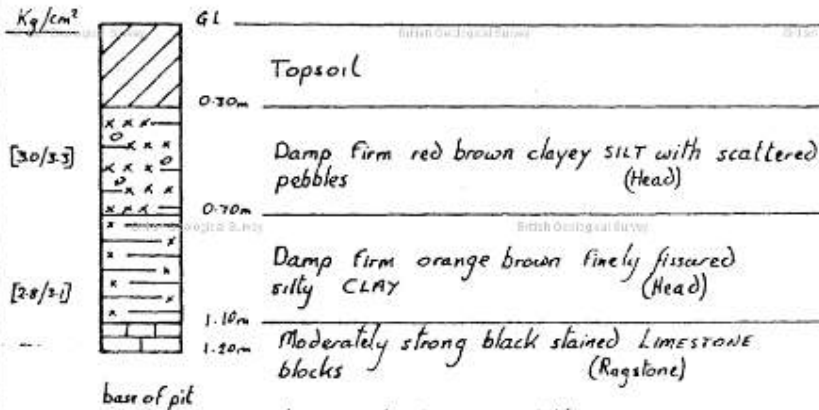
Checked By

TRIAL PIT LOGS

Date

8/11/78

TP 9



pit remained dry and stable
Machine refusal at ragstone band
Maximum depth to ragstone 1.1m.
Minimum " " " 0.8m.

Fig. 2

Appendix G
Southern Water Plans

Ms Naomi Thamba
Ardent Consulting Engineers
Suite Office 3
Garage Studios
41-43 St Marys Gate
The Lace Market
Nottingham
NG1 1PU

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: **0330 303 0119**

Email: developerservices@southernwater.co.uk

Your Ref:

Our Ref:

DS_CC_PDE-105355

Date:

05 November 2018

Site: Land rear of 17 to 23, Cherry Orchard, Ditton, Aylesford, Kent, ME20 6QS

Dear Ms Thamba,

We have completed the capacity check for the above development site and the results are as follows:-

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow for the above development at manhole reference TQ71572700. The proposed development would increase flows to the public sewerage system, and existing properties and land may be subject to a greater risk of flooding as a result. Additional off-site sewers, or improvements to existing sewers, will be required to provide sufficient capacity to service the development.

The nearest point where capacity is currently available is at **Ditton WTW** which is located approximately 1 km to the North of the proposed development site. Rights are not issued for a direct connection to Wastewater Treatment Works. Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

Please note, as from 1st April 2018 we have moved to the "New Connections Services Charging Arrangements". We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a

set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link:

<https://beta.southernwater.co.uk/infrastructure-charges>

Alternatively, new appointees and variations (NAVs), also known as 'inset' companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal S106 connection application is required to be completed and approved by Southern Water Services. Please see the following link:

<https://developerservices.southernwater.co.uk/ConnectiontoPublicSewer/ApplicationForm>

Should you require any further information, please contact us at the above mentioned phone number or address.

Yours sincerely,



Geoff Hall

Developer Services

Please note: -

The information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

From: [AdminTeam_DeveloperServices](#)
To: [Peter Sparham](#)
Subject: RE: 182600 southern water - pre-development enquiry results - site b
Date: 19 November 2018 12:11:18

Dear Mr Sparham,

Thank you for your enquiry. There is insufficient capacity within the vicinity of the site to accommodate the proposed foul flows. Under the new charging arrangements, it is Southern Water's responsibility to provide capacity within the network. This would usually get picked up during the planning consultation process. Southern Water aim to complete upgrades within 2 years when there is a clear commitment from the developer to go ahead with the development.

Kind regards,

Geoff Hall
Administration Team



From: Peter Sparham [mailto:psparham@ardent-ce.co.uk]
Sent: 15 November 2018 12:23
To: Developer Services <Developer.Services@southernwater.co.uk>
Cc: Naomi Thamba <nthamba@ardent-ce.co.uk>; Andrew Braun <abraun@ardent-ce.co.uk>
Subject: FW: 182600 southern water - pre-development enquiry results - site b

Geoff,

Following your response on the above site the proposed discharge location is not considered reasonable, therefore, please can you advise if any capacity is available in the sewer in Kiln Barn Road to the east of the site.

Alternatively please can you provide us with timescales to upgrade your infrastructure to serve the proposed development.

Should you require any additional information regarding the development of the site please do not hesitate to contact me.

Your earliest response is appreciated.

Regards,

Peter Sparham
Associate



Office 3, The Garage Studios, 41-43 St Mary 's Gate, The Lace Market, Nottingham NG1 1PU

T 0115 697 0940
M 07432 714216



Ardent
Office 3, The Garage Studios, 41-43
St Mary s Gate
Nottingham
NG1 1PU

Your ref 182600
Our ref 311327
Date 04 October 2018
Contact searches@southernwater.co.uk
Tel 0845 272 0845
0330 303 0276
Fax 01634 844514

Attention: Naomi Thamba

Dear Customer

Re: Provision of public sewer record extract

**Location: Land below Cherry Orchard, Ditton, Aylesford, Kent,
ME20 6QS**

Thank you for your order regarding the provision of extracts of our sewer and/or water main records. Please find enclosed the extracts from Southern Water's records for the above location.

We confirm payment of your fee in the sum of £49.92 and enclose a VAT receipt for your records.

Customers should be aware that there are areas within our region in which there are neither sewers nor water mains. Similarly, whilst the enclosed extract may indicate the approximate location of our apparatus in the area of interest, it should not be relied upon as showing that further infrastructure does not exist and may subsequently be found following site investigation. Actual positions of the disclosed (and any undisclosed) infrastructure should therefore be determined on site, because Southern Water does not accept any responsibility for inaccuracy or omission regarding the enclosed plan. Accordingly it should not be considered to be a definitive document.

Should you require any further assistance regarding this matter, please contact the LandSearch team.

Yours faithfully

LandSearch

VAT receipt

Ordered by:

Ardent
St Mary s Gate
Nottingham
NG1 1PU

VAT registration number: 813 0378 56
Order reference: 311327
Your reference: 182600

Receipt for provision of an extract from the public sewer and/or water main records.

Location	Costs
Land below Cherry Orchard Ditton Aylesford Kent ME20 6QS	£41.60
Net total	£41.60
VAT	£8.32
Total	£49.92
Paid	Paid in full

Thank you for your payment:

Received on: 2 October 2018

For enquiries regarding the information provided in this receipt, please contact the LandSearch team:

Tel: 0845 270 0212
0330 303 0276 (individual consumers)

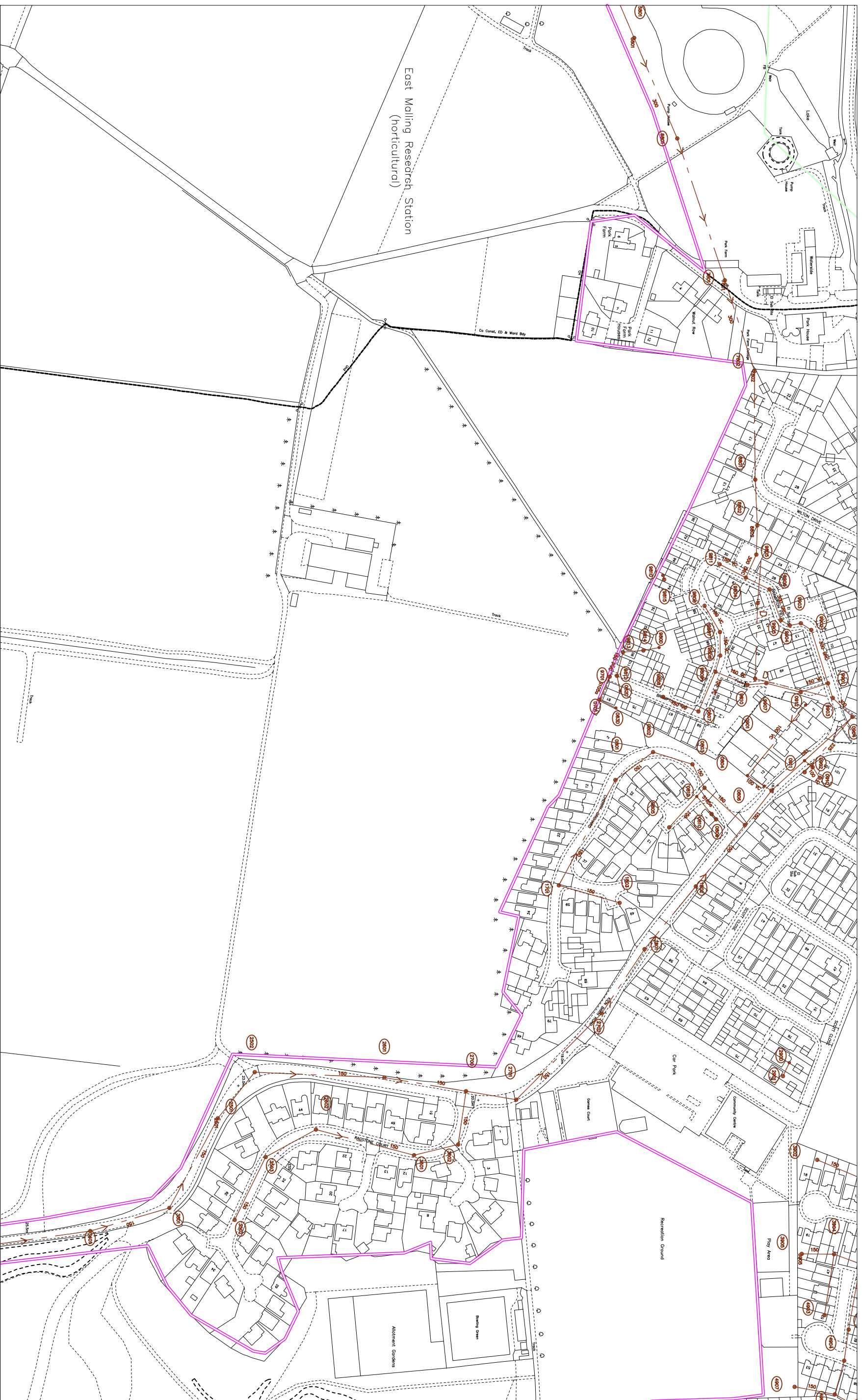
Email: searches@southernwater.co.uk

Web: www.southernwater.co.uk

LandSearch
Southern Water Services
Southern House
Capstone Road
Chatham
Kent
ME5 7QA



157965



157387

O.S. REF.
TQ7157NW

Title: 311327_Land below Cherry Orcha

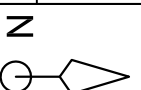
Drawn by: okuneyf

Scale: 1:2500

Date: 04/10/2018


The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy.
The actual positions should be determined on site.
WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UK) materials may include Bonded Asbestos Cement

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571481

Appendix H
Drainage Calculations

Ardent Consulting Engineers		Page 1
Office 3, Garage Studios, St The Lace Market, Nottingham NG1 1PU	Site B East Malling Greenfield Runoff	
Date 15/11/2018 File	Designed by NT Checked by PS	
XP Solutions	Source Control 2017.1.2	

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 655 Urban 0.000
Area (ha) 8.830 Soil 0.400 Region Number Region 7

Results 1/s

QBAR Rural 27.8
QBAR Urban 27.8

Q1 year 23.6

Q1 year 23.6
Q30 years 63.0
Q100 years 88.7

182600 – East Malling Trust – Site B

Restricted Discharge Rate Estimated Attenuation Storage

The screenshot shows the 'Quick Storage Estimate' window with the 'Variables' tab selected. The left sidebar contains a 'Micro Drainage' logo and a vertical menu with options: Variables, Results, Design, Overview 2D, Overview 3D, and Vt. The main area is titled 'Variables' and contains the following settings:

FSR Rainfall	Cv (Summer)	0.750
Return Period (years)	Cv (Winter)	0.840
Region	Impervious Area (ha)	5.830
Map	Maximum Allowable Discharge (l/s)	88.7
M5-60 (mm)	Infiltration Coefficient (m/hr)	0.00000
Ratio R	Safety Factor	2.0
	Climate Change (%)	40

At the bottom of the window, there are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'. A status bar at the very bottom reads: 'Enter Maximum Allowable Discharge between 0.0 and 999999.0'.

The screenshot shows the 'Quick Storage Estimate' window with the 'Results' tab selected. The left sidebar is the same as in the previous screenshot. The main area is titled 'Results' and contains the following text:

Global Variables require approximate storage of between 2754 m³ and 3821 m³.

These values are estimates only and should not be used for design purposes.

At the bottom of the window, there are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'. A status bar at the very bottom reads: 'Enter Maximum Allowable Discharge between 0.0 and 999999.0'.

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/14
 File 182600 - SITE B - Borehole

Designed by DWJP
 Checked by BC

Micro Drainage Source Control 2016.1

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 319 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	17.571	4.921	1.1	42.4	O K
30 min Summer	17.626	4.976	1.1	47.9	O K
60 min Summer	17.680	5.030	1.4	53.3	O K
120 min Summer	17.719	5.069	1.8	57.2	O K
180 min Summer	17.726	5.076	1.8	57.9	O K
240 min Summer	17.721	5.071	1.8	57.4	O K
360 min Summer	17.708	5.058	1.7	56.2	O K
480 min Summer	17.694	5.044	1.5	54.7	O K
600 min Summer	17.681	5.031	1.4	53.4	O K
720 min Summer	17.669	5.019	1.3	52.3	O K
960 min Summer	17.652	5.002	1.1	50.5	O K
1440 min Summer	17.608	4.958	1.1	46.1	O K
2160 min Summer	17.545	4.895	1.1	39.8	O K
2880 min Summer	17.485	4.835	1.1	33.8	O K
4320 min Summer	17.369	4.719	1.1	22.2	O K
5760 min Summer	17.281	4.631	1.0	13.4	O K
7200 min Summer	17.218	4.568	1.0	7.1	O K
8640 min Summer	17.176	4.526	1.0	2.9	O K
10080 min Summer	17.155	4.505	1.0	0.8	O K
15 min Winter	17.623	4.973	1.1	47.6	O K
30 min Winter	17.686	5.036	1.5	53.9	O K
60 min Winter	17.744	5.094	2.0	59.7	O K
120 min Winter	17.785	5.135	2.4	63.9	O K
180 min Winter	17.793	5.143	2.5	64.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	232.173	0.0	19
30 min Summer	133.367	0.0	34
60 min Summer	76.609	0.0	62
120 min Summer	44.007	0.0	122
180 min Summer	31.818	0.0	180
240 min Summer	25.279	0.0	232
360 min Summer	18.277	0.0	296
480 min Summer	14.521	0.0	368
600 min Summer	12.147	0.0	444
720 min Summer	10.499	0.0	520
960 min Summer	8.401	0.0	674
1440 min Summer	6.136	0.0	952
2160 min Summer	4.482	0.0	1360
2880 min Summer	3.587	0.0	1756
4320 min Summer	2.577	0.0	2508
5760 min Summer	2.039	0.0	3224
7200 min Summer	1.700	0.0	3888
8640 min Summer	1.465	0.0	4504
10080 min Summer	1.292	0.0	5144
15 min Winter	232.173	0.0	19
30 min Winter	133.367	0.0	33
60 min Winter	76.609	0.0	62
120 min Winter	44.007	0.0	118
180 min Winter	31.818	0.0	174

4th Floor, Diamond House
36-38 Hatton Garden
London EC1N 8EB

East Malling Trust (Site B)
Surface Water
Drainage Strategy



Date 18/12/14

Designed by DWJP

File 182600 - SITE B - Borehole

Checked by BC

Micro Drainage

Source Control 2016.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	17.789	5.139	2.4	64.2	O K
360 min Winter	17.778	5.128	2.3	63.1	O K
480 min Winter	17.764	5.114	2.2	61.7	O K
600 min Winter	17.749	5.099	2.1	60.2	O K
720 min Winter	17.732	5.082	1.9	58.6	O K
960 min Winter	17.709	5.059	1.7	56.3	O K
1440 min Winter	17.668	5.018	1.3	52.1	O K
2160 min Winter	17.576	4.926	1.1	42.9	O K
2880 min Winter	17.484	4.834	1.1	33.7	O K
4320 min Winter	17.317	4.667	1.1	17.0	O K
5760 min Winter	17.201	4.551	1.0	5.4	O K
7200 min Winter	17.094	4.444	1.0	0.3	O K
8640 min Winter	16.470	3.820	0.9	0.3	O K
10080 min Winter	16.010	3.360	0.8	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	25.279	0.0	224
360 min Winter	18.277	0.0	280
480 min Winter	14.521	0.0	360
600 min Winter	12.147	0.0	440
720 min Winter	10.499	0.0	520
960 min Winter	8.401	0.0	682
1440 min Winter	6.136	0.0	1010
2160 min Winter	4.482	0.0	1472
2880 min Winter	3.587	0.0	1876
4320 min Winter	2.577	0.0	2636
5760 min Winter	2.039	0.0	3240
7200 min Winter	1.700	0.0	3672
8640 min Winter	1.465	0.0	4384
10080 min Winter	1.292	0.0	4976

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/14
 File 182600 - SITE B - Borehole

Designed by DWJP
 Checked by BC

Micro Drainage Source Control 2016.1

Rainfall Details

Rainfall Model	FEH	F (1km)	2.544
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 571200 157650 TQ 71200 57650	Winter Storms	Yes
C (1km)	-0.023	Cv (Summer)	0.750
D1 (1km)	0.306	Cv (Winter)	0.840
D2 (1km)	0.331	Shortest Storm (mins)	15
D3 (1km)	0.291	Longest Storm (mins)	10080
E (1km)	0.317	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.100

Time (mins) Area
From: To: (ha)

0 4 0.100

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/14

Designed by DWJP

File 182600 - SITE B - Borehole

Checked by BC

Micro Drainage Source Control 2016.1

Model Details

Storage is Online Cover Level (m) 18.150

Deep Bore Soakaway Structure

Chamber Invert Level (m)	17.150	Borehole Depth (m)	4.500
Chamber Diameter/Width (m)	10.000	Infiltration Coefficient Base (m/hr)	1.69600
Chamber Length (m)	10.000	Safety Factor	2.0
Borehole Diameter (m)	0.300		

Side		Side	
Depth	Infil.	Depth	Infil.
(m)	Coef.	(m)	Coef.
	(m/hr)		(m/hr)
0.000	1.69600	5.000	1.69600

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/17
 File 182600 - SITE B - BULK CRATE

Designed by DWJP
 Checked by BC

Micro Drainage Source Control 2016.1

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 87 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	15.531	2.381	314.1	2262.2	O K
30 min Summer	15.684	2.534	319.1	2406.9	O K
60 min Summer	15.649	2.499	318.0	2374.3	O K
120 min Summer	15.411	2.261	310.1	2147.9	O K
180 min Summer	15.230	2.080	304.1	1975.8	O K
240 min Summer	15.069	1.919	298.8	1823.1	O K
360 min Summer	14.776	1.626	289.2	1544.3	O K
480 min Summer	14.514	1.364	280.5	1296.0	O K
600 min Summer	14.281	1.131	272.9	1074.6	O K
720 min Summer	14.075	0.925	266.1	879.1	O K
960 min Summer	13.757	0.607	255.6	576.3	O K
1440 min Summer	13.351	0.201	242.2	190.8	O K
2160 min Summer	13.195	0.045	214.7	42.9	O K
2880 min Summer	13.186	0.036	172.0	34.1	O K
4320 min Summer	13.176	0.026	124.5	24.8	O K
5760 min Summer	13.171	0.021	98.4	19.7	O K
7200 min Summer	13.167	0.017	81.8	16.5	O K
8640 min Summer	13.165	0.015	70.0	14.5	O K
10080 min Summer	13.163	0.013	62.9	12.6	O K
15 min Winter	15.848	2.698	324.5	2563.5	O K
30 min Winter	16.052	2.902	331.3	2757.3	O K
60 min Winter	16.074	2.924	332.0	2777.5	O K
120 min Winter	15.800	2.650	323.0	2517.7	O K
180 min Winter	15.545	2.395	314.5	2275.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	232.173	0.0	18
30 min Summer	133.367	0.0	32
60 min Summer	76.609	0.0	60
120 min Summer	44.007	0.0	90
180 min Summer	31.818	0.0	124
240 min Summer	25.279	0.0	158
360 min Summer	18.277	0.0	224
480 min Summer	14.521	0.0	290
600 min Summer	12.147	0.0	354
720 min Summer	10.499	0.0	416
960 min Summer	8.401	0.0	532
1440 min Summer	6.136	0.0	764
2160 min Summer	4.482	0.0	1072
2880 min Summer	3.587	0.0	1424
4320 min Summer	2.577	0.0	2160
5760 min Summer	2.039	0.0	2864
7200 min Summer	1.700	0.0	3592
8640 min Summer	1.465	0.0	4296
10080 min Summer	1.292	0.0	5104
15 min Winter	232.173	0.0	18
30 min Winter	133.367	0.0	31
60 min Winter	76.609	0.0	58
120 min Winter	44.007	0.0	96
180 min Winter	31.818	0.0	134

4th Floor, Diamond House
36-38 Hatton Garden
London EC1N 8EB

East Malling Trust (Site B)
Surface Water
Drainage Strategy



Date 18/12/17

Designed by DWJP

File 182600 - SITE B - BULK CRATE

Checked by BC

Micro Drainage

Source Control 2016.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	15.310	2.160	306.8	2051.9	O K
360 min Winter	14.871	1.721	292.3	1635.3	O K
480 min Winter	14.485	1.335	279.6	1268.2	O K
600 min Winter	14.151	1.001	268.6	951.0	O K
720 min Winter	13.866	0.716	259.2	679.9	O K
960 min Winter	13.447	0.297	245.3	282.1	O K
1440 min Winter	13.195	0.045	212.3	42.3	O K
2160 min Winter	13.183	0.033	155.4	30.9	O K
2880 min Winter	13.176	0.026	124.5	24.7	O K
4320 min Winter	13.169	0.019	89.0	17.9	O K
5760 min Winter	13.165	0.015	72.3	14.5	O K
7200 min Winter	13.163	0.013	60.5	12.1	O K
8640 min Winter	13.161	0.011	51.0	10.3	O K
10080 min Winter	13.160	0.010	46.3	9.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	25.279	0.0	170
360 min Winter	18.277	0.0	242
480 min Winter	14.521	0.0	310
600 min Winter	12.147	0.0	374
720 min Winter	10.499	0.0	434
960 min Winter	8.401	0.0	548
1440 min Winter	6.136	0.0	734
2160 min Winter	4.482	0.0	1100
2880 min Winter	3.587	0.0	1468
4320 min Winter	2.577	0.0	2148
5760 min Winter	2.039	0.0	2832
7200 min Winter	1.700	0.0	3608
8640 min Winter	1.465	0.0	4384
10080 min Winter	1.292	0.0	5112

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/17

Designed by DWJP

File 182600 - SITE B - BULK CRATE

Checked by BC

Micro Drainage Source Control 2016.1

Rainfall Details

Rainfall Model	FEH	F (1km)	2.544
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 571200 157650 TQ 71200 57650	Winter Storms	Yes
C (1km)	-0.023	Cv (Summer)	0.750
D1 (1km)	0.306	Cv (Winter)	0.840
D2 (1km)	0.331	Shortest Storm (mins)	15
D3 (1km)	0.291	Longest Storm (mins)	10080
E (1km)	0.317	Climate Change %	+40

Time Area Diagram

Total Area (ha) 5.830

Time (mins) Area
From: To: (ha)

0 4 5.830

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/17
 File 182600 - SITE B - BULK CRATE

Designed by DWJP
 Checked by BC

Micro Drainage Source Control 2016.1

Model Details

Storage is Online Cover Level (m) 18.150

Cellular Storage Structure

Invert Level (m) 13.150 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 1.69600 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 1.69600

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1000.0	1000.0	3.200	1000.0	1448.0	3.300	0.0	1448.0

Appendix I
Drainage Strategy Plan

NOTE : ALL OFFSITE WORKS SUBJECT TO ACCESS RIGHTS REVIEW AND VERIFICATION. PROVISION OF EASEMENT PROVISIONS FOR CONSTRUCTION AND FUTURE MAINTENANCE TO BE CONSIDERED DURING DETAILED DESIGN WORKS.

OPTION 3A (NORTH) - PROPOSED RESTRICTED OFFSITE DISCHARGE TO WATERCOURSE.
 CONNECTION TO WATERCOURSE SUBJECT TO FURTHER TOPOGRAPHICAL SURVEY AND VERIFICATION OF CRITICAL DRAINAGE DESIGN. CONSULTATION WITH ENVIRONMENT AGENCY REGARDING DISCHARGE HEADWALL PROPOSALS WILL BE REQUIRED.

OPTION 2 - PROPOSED FOUL GRAVITY DISCHARGE TO EXISTING ADOPTED FOUL NETWORK
 CONNECTION SUBJECT TO APPROVAL WITH SOUTHERN WATER AND NETWORK CAPACITY UPGRADE WORKS

OPTION 3B (WEST) - PROPOSED RESTRICTED OFFSITE DISCHARGE TO WATERCOURSE/LAKE.
 CONNECTION TO WATERCOURSE/LAKE SUBJECT TO FURTHER TOPOGRAPHICAL SURVEY AND VERIFICATION OF CRITICAL DRAINAGE DESIGN. CONSULTATION WITH ENVIRONMENT AGENCY REGARDING DISCHARGE HEADWALL PROPOSALS WILL BE REQUIRED.

OPTION 3 - RESTRICTED OFFSITE DISCHARGE FLOW CONTROL DEVICE
 PROPOSED FLOW CONTROL DEVICE AND CHAMBER BASED UPON GREENFIELD RUN OFF RATES (TABLE 5-1)
 1 IN 1 = 23.6l/s
 1 IN 30 = 63.0l/s
 1 IN 100 = 88.7l/s

DISCHARGE HEADWALL TO DISCHARGE BASIN
 TO SECURE THE ADOPTABILITY OF THE ONSITE DRAINAGE NETWORK IT IS PROPOSED TO PROVIDE A DISCHARGE HEADWALL WHICH WILL BE PROVIDED ABOVE THE 1 IN 30 YEAR DESIGN STORM PEAK WATER LEVEL.

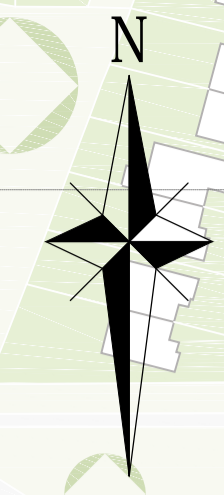
OPTION 2 - INFILTRATION (MASS SYSTEM) ATTENUATION DISCHARGE BASIN & BELOW GROUND TANK
 DISCHARGE BASIN BASE AREA 2,091 M²
 DISCHARGE BASIN 1.5M DEEP WITH 300MM FREEBOARD ALLOWANCE FOR 1 IN 100 YR DESIGN STORM, INCLUDING CLIMATE CHANGE. 1 IN 4 SIDE SLOPES
 TANK 50M x 20M = 1,000 M³
 TANK DEPTH SUBJECT TO DETAILED DESIGN AND INFILTRATION STRATA AND TESTING RESULTS
 NOTE : PROVISION OF CELLULAR STORAGE FOR INFILTRATION ONLY REQUIRES CIRCA 3.2M DEPTH OF STORAGE.
 COMBINATION OF DISCHARGE BASIN AND CRATES IS RECOMMENDED FOR ADOPTABILITY AND OPTIMISATION OF STORAGE VOLUMES.
 REFER TO FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY DOCUMENT 182600-01 FOR SURFACE WATER COMBINATIONS AND OPTIONS

OPTION 3 - RESTRICTED OFFSITE DISCHARGE ATTENUATION BASIN
 DISCHARGE BASIN BASE AREA 2,091 M²
 DISCHARGE BASIN 1.5M DEEP WITH 300MM FREEBOARD ALLOWANCE FOR 1 IN 100 YR DESIGN STORM, INCLUDING CLIMATE CHANGE. 1 IN 4 SIDE SLOPES
 REFER TO FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY DOCUMENT 182600-01 FOR SURFACE WATER COMBINATIONS AND OPTIONS

OPTION 1 - INFILTRATION (LOCALISED) SYSTEMS BOREHOLE/SOAKAWAY & ATTENUATION
 CELLULAR ATTENUATION = 100 M³
 INFILTRATION RATE 400 L/MIN (1.69m³/hr)
 15m EXCLUSION ZONE TO BOREHOLE
 NOTE : FURTHER PARKING COURTYARDS COULD PROVIDE INFILTRATION USING ALTERNATIVE SOAKAWAY METHODS WITH REDUCTION IN EXCLUSION ZONE. SUBJECT TO LOCALISED TESTING.

OPTION 1 - PROPOSED FOUL PUMPING STATION WITH 15m STAND OFF
 LOCATION TO FWPS SUBJECT TO REVIEW BASED UPON SITE LEVELS AND CRITICAL DRAINAGE FALLS

NOTES:
 SITE AREA = 11.58HA
 DEVELOPABLE AREA = 8.83HA
 IMPERMEABLE AREA (60%) = 5.3HA
 URBAN CREEP (10%) = 0.53HA
 TOTAL IMPERMEABLE AREA INCLUDING URBAN CREEP = 5.83HA



- NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS (SEE CDM NOTES) AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 - DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
 - ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
 - ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
 - NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 - ANY WORKS OUTSIDE RED SITE BOUNDARY ARE FOR INFORMATION PURPOSES ONLY. UNLESS SPECIFICALLY NOTED, ALL WORKS OUTSIDE THE SITE BOUNDARY WILL BE UNDERTAKEN BY OTHERS UNDER A SEPARATE CONTRACT.

- KEY:**
- PROPOSED BOUNDARY
 - ATTENUATION BASIN
 - EXISTING SOUTHERN WATER SEWERS
 - PROPOSED BELOW GROUND TANK
 - PROPOSED FOUL RISING MAIN
 - BOREHOLES WITH 15m OFFSET OF BUILDINGS
 - PROPOSED DISCHARGE WATER NETWORK

THE SURFACE WATER DESIGN IS SUBJECT TO DETAILED DESIGN AND LLFA & SOUTHERN WATER APPROVAL

OPTION 1 - FOUL WATER PUMPING STATION RISING MAIN DISCHARGE CONNECTION TO EX2601.
 CONNECTION SUBJECT TO APPROVAL WITH SOUTHERN WATER AND NETWORK CAPACITY UPGRADE WORKS

FOR PLANNING ONLY

B	DRAINAGE STRATEGY UPDATED	DP	DP	BC	18/01/18
A	DRAINAGE STRATEGY UPDATED	CHB	PS		05/12/18
Rev	Description	Drn	Chk	App	Date

ARDENT CONSULTING ENGINEERS

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 EC3M 5JF

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worksafe consultant
 www.smasstd.com

SSIP

Client	EAST MALLING TRUST		
Project Title	DITTON EDGE (SITE B)		
Drawing Title	PROPOSED DRAINAGE STRATEGY		
A1 Scale	Date	Designed by	NT
1:1000	21/08/2018	Checked by	PS
Drawn by	NT	Approved by	
Drawing Number	182600/001		Rev B

Appendix J
Kent County Council Pro-Forma

Drainage Strategy Summary



1. Site details	
Site/development name	SITE B, EAST MALLING
Address including post code	KILN BARN ROAD, EAST MALLING ME20 6AJ
Grid reference	E 571024 N 157671
LPA reference	
Type of application	Outline <input checked="" type="checkbox"/> Full <input type="checkbox"/> Discharge of Conditions <input type="checkbox"/> Other <input type="checkbox"/>
Has pre-application advice been sought from KCC?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
If so, KCC Reference Number:	
Pre-application Meeting Date:	
Site condition	Greenfield <input checked="" type="checkbox"/> Brownfield <input type="checkbox"/>

2. Existing drainage		Document/Plan where information is stated:
Total site area (ha)	11.26	N/A
Impermeable area (ha)	0	
Final discharge location	Infiltration <input checked="" type="checkbox"/> Watercourse <input type="checkbox"/> Sewer <input type="checkbox"/> Tidal reach/sea <input type="checkbox"/>	
Where applicable specify catchment runoff rates:	Greenfield runoff rates (l/s) Existing brownfield runoff rates (l/s)	
QBAR (l/s)		
1 in 1 year (l/s)		
1 in 30 year (l/s)		
1 in 100 year (l/s)		
3. Proposed drainage areas		Document/Plan where information is stated:
Impermeable area (ha)	Roof	
	Highway/road	
	Other paved areas	
	Total	5.83
Permeable area (ha)	Open space	2.43
	Other permeable areas	3.00
	Total	5.43
Final discharge location	Infiltration <input checked="" type="checkbox"/> Infiltration rate 6.7×10^{-3} m/s Watercourse <input type="checkbox"/> Sewer <input type="checkbox"/> Tidal reach/sea <input type="checkbox"/>	
Climate change allowance included in design	20% <input type="checkbox"/> 30% <input type="checkbox"/> 40% <input checked="" type="checkbox"/>	

4. Post-Development Discharge rates, with mitigation			Document/Plan where information is stated:
Describe development drainage strategy in general terms: DISCHARGE VIA DEEP BOREHOLE SOAKAWAYS			
(a) Soil type and discharge	Permeable <input checked="" type="checkbox"/> No off-site discharge i.e. infiltration <input type="checkbox"/>	Semi-permeable <input type="checkbox"/> Infiltration maximised, QBAR off-site <input type="checkbox"/>	Impermeable <input type="checkbox"/> Staged discharge <input type="checkbox"/>
(b) Controlled developed discharge rates (l/s)	1 in 1 year		N/A
	1 in 30 year		
	1 in 100 year		
	1 in 100 year + CC		
5. Discharge Volumes			Document/Plan where information is stated:
	Existing volume (m ³)	Proposed volume (m ³)	N/A
1 in 1 year			
1 in 30 year			
1 in 100 year			
1 in 100 year + CC			
6. Plans/Drawings			Document/Plan where information is stated:
A schematic of the drainage <u>strategy</u> has been included? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
A schematic of the drainage <u>network model</u> has been included? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

All information presented above should be contained within the attached Flood Risk Assessment, Drainage Strategy or Statement and be substantiated through plans and appropriate calculations.

Form completed by	PETER SPARHAM
Qualifications	BENG CENG MICE
Company	ARDENT
Telephone	0115 697 0940
Email	psparham@ardent-ce.co.uk
On behalf of (client's details)	EAST MALLING TRUST
Date	15/11/18.

Appendix K
Infiltration Test Results

Our Ref: JNR/TRL/AM/J13838

1st November 2018

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Dr L D Mockett BSc PhD PGDip FGS (Joint Managing Director)
Dr J Kelly BSc PhD DIC (Joint Managing Director)
S F Pratt BSc MSc CGeol FGS DIC
P J Sugden BSc MSc FGS
D Vooght BSc (Civ Eng) MSc (Non Executive)
A J Timms CEng MICE (Non Executive)
Co. Secretary J N Joseph
Consultant Dr D Petley BSc PhD DIC MHIT FGS
D Illingworth BSc FGS

For the attention of Peter Sparham
(By email: psparham@ardent-ce.co.uk)

Dear Peter,

Re: Borehole Soakaway Installation at: East Malling Site B, Ditton, Aylesford, Kent, ME20 6QA
National Grid Reference: TQ 71010 57676
Geology: Hythe Formation

1 Authority

Our authority for carrying out this work is contained in a Project Order form completed by Peter Sparham of Ardent Consulting Engineers, dated 19th October 2018. The form refers to our quotation ref. Q18-20117(a).

2 Background and Objectives

The object of the investigation was to drill boreholes to test for infiltration within the Hythe Formation. The borehole locations were specified to us by the Client. The site location is shown on the attached Figure 1.

3 Scope

This letter report presents our findings and test results. As with any site there may be differences in ground conditions between exploratory hole positions.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

Contamination issues are not considered in this report.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Limited believes are reliable. Nevertheless, Southern Testing Laboratories Limited cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Ardent Consulting Engineers and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

Recommendations contained in this report may not be appropriate to alternative development schemes.

4 Borehole Logs, Groundwater, and Soakage Test Results

Three 200mm diameter down-the-hole-hammer boreholes were drilled in the locations specified to us by the Client. The borehole locations are shown on the attached plan (Figure 2).

The materials encountered comprised a covering of sandy clays / clayey sands, overlying interbedded limestone and sandstone. The depth to the top of the limestone/sandstone was variable, and was found to be between 1.0 and 4.5m bgl. The intended depth of the boreholes was 25m bgl. However, the boreholes were terminated early at between 17.0 and 17.5m bgl due to the presence of groundwater. It is our understanding that the Environment Agency would require an unsaturated zone beneath the base of any working borehole soakaway.

Groundwater was encountered in the boreholes as follows:

BH ref	BH ground level (mAOD)	Depth of groundwater strike		Rest level of groundwater	
		mBGL	mAOD	mBGL	mAOD
BH1	19.08	15.50	+3.58	11.40	+7.68
BH2	20.54	17.00	+3.54	12.00	+8.54
BH3	18.13	17.50	+0.63	10.20	+7.93

Table 1: Groundwater observations.

The depth of the groundwater strike can be masked by the drilling methods, and so may not represent the actual level of groundwater beneath the site. However, the rest level of the groundwater before and after the soakage tests appear to be consistent between the three boreholes, and it would appear that the groundwater is at a level of about +8.00m AOD. This will need to be considered in the design of any borehole soakaways on this site.

A soakage test was undertaken in each borehole. The results of the testing are shown in the table below:

BH ref	Approximate soakage rate (litres/minute)	Water level during test (m bgl)
BH1	400	4.50
BH2	100	3.00
BH3	400	3.00

Table 2: Constant head borehole soakage results

After each test the water level receded down to the rest water levels shown in Table 1.

A suitable factor of safety should be applied for the design soakage rate.

If you have any queries or we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,



Thomas Lees MSci MSc CGeol FGS UK RoGEP Professional

For and on behalf of

Southern Testing Laboratories Limited

DDI: 01342 333 136

Email: tlees@southerntesting.co.uk

encs



Site Location

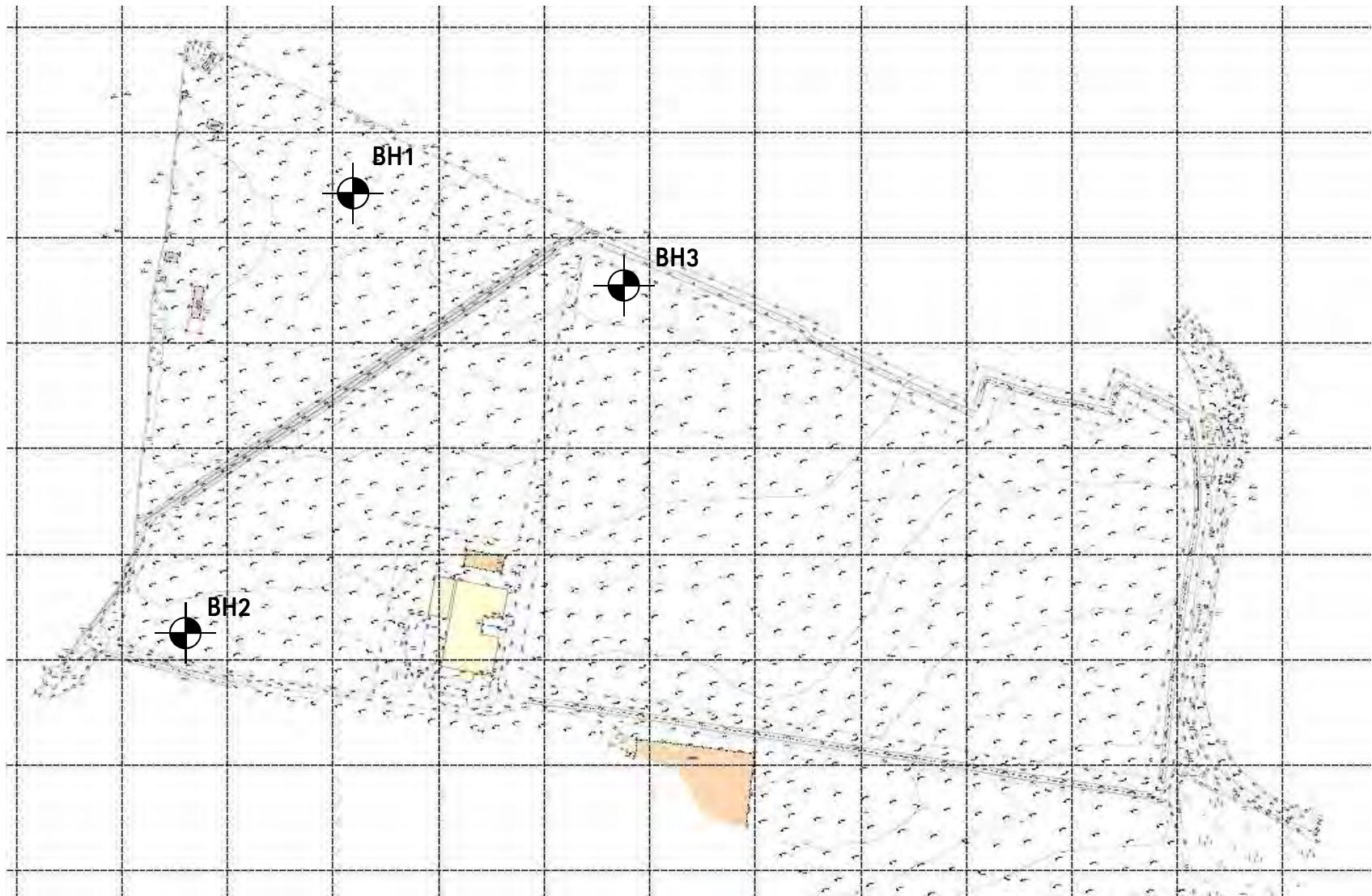
Contains Ordnance Survey Data © Crown Copyright and Database Right 2018

Site: East Malling Site B	STL: J13838	Fig No: 1
Date: 1 November 2018	Site Location Plan	



Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN





NB: Positions of Boreholes are only indicative unless dimensioned

Site: East Malling Site B

STL: J13838

Fig No: 2

Date: 1 November 2018

Borehole Location Plan



Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
 ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN



Project Name: East Malling Site B

Remarks:

Co-ordinates:

Level:

Logger:

570860E - 157820N

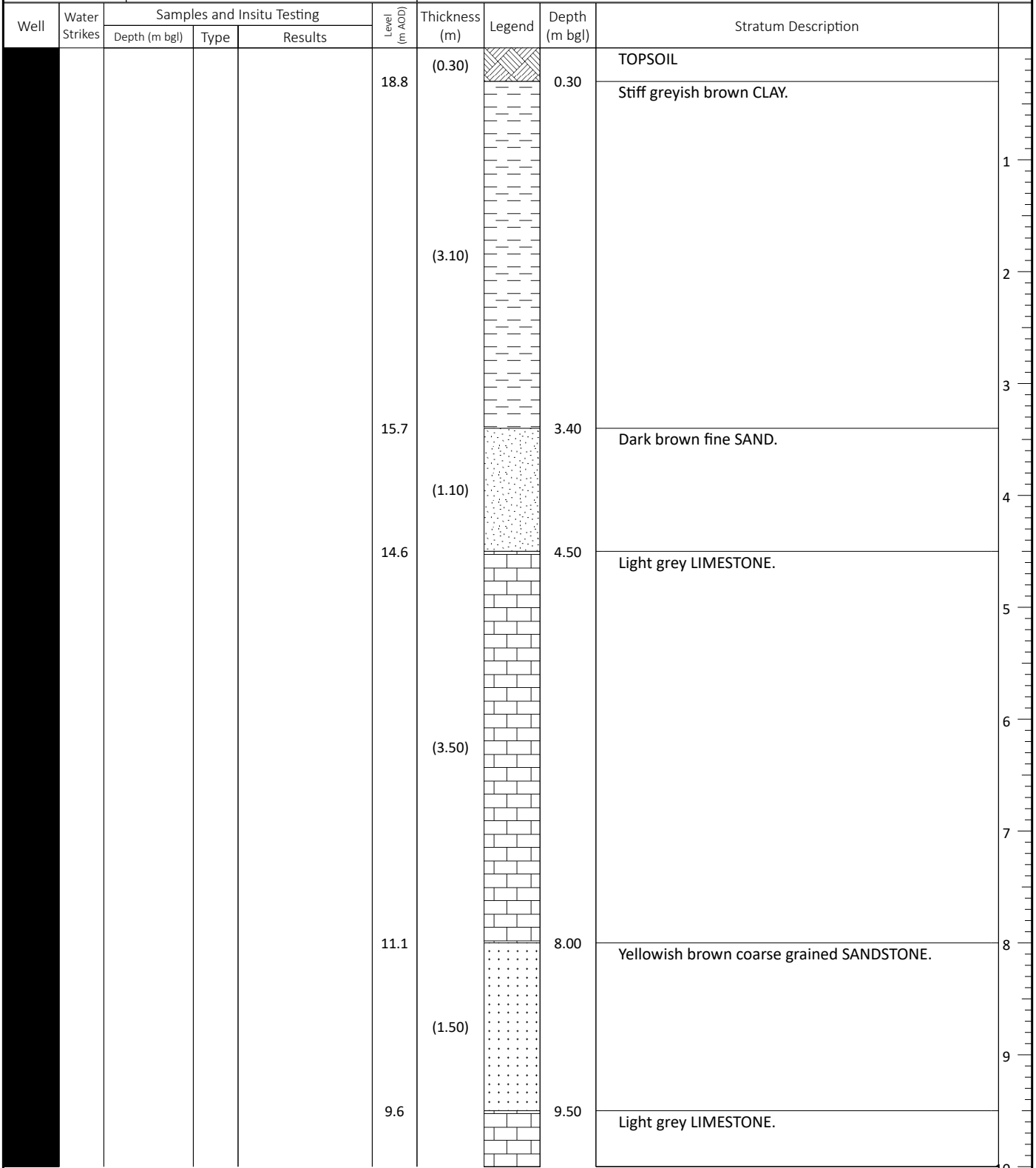
19.08

TJ

Location: Kiln Barn Road, East Malling, ME20 6QS

Down-the-hole-hammer. Rest groundwater level at 11.4m bgl. Driller's descriptions only.

Client: Ardent Consulting Engineers



Hole Details		Casing Details		Waterstrike (m bgl)					Standing/Chiselling (m bgl)				
Depth (m bgl)	Dia. (mm)	Depth (m bgl)	Dia. (mm)	Date	Depth Strike	Depth Casing	Depth Sealed	Rose to:	Time (mins)	From	To	Time	Remarks
17.00	200			25-10-2018	15.50			11.40	10				

Project Name: East Malling Site B

Remarks:

Co-ordinates:

Level:

Logger:

570860E - 157820N

19.08

TJ

Location: Kiln Barn Road, East Malling, ME20 6QS

Down-the-hole-hammer. Rest groundwater level at 11.4m bgl. Driller's descriptions only.

Client: Ardent Consulting Engineers

Well	Water Strikes	Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
		Depth (m bgl)	Type	Results					
11.4 17.00								Light grey LIMESTONE.	
				3.6	(6.00)		15.50	Yellowish brown coarse grained SANDSTONE.	
					2.1	(1.50)		17.00	End of Borehole at 17.00m

Hole Details		Casing Details		Waterstrike (m bgl)					Standing/Chiselling (m bgl)				
Depth (m bgl)	Dia. (mm)	Depth (m bgl)	Dia. (mm)	Date	Depth Strike	Depth Casing	Depth Sealed	Rose to:	Time (mins)	From	To	Time	Remarks
17.00	200			25-10-2018	15.50			11.40	10				

Project Name: East Malling Site B

Remarks:

Co-ordinates:

Level:

Logger:

570763E - 157610N

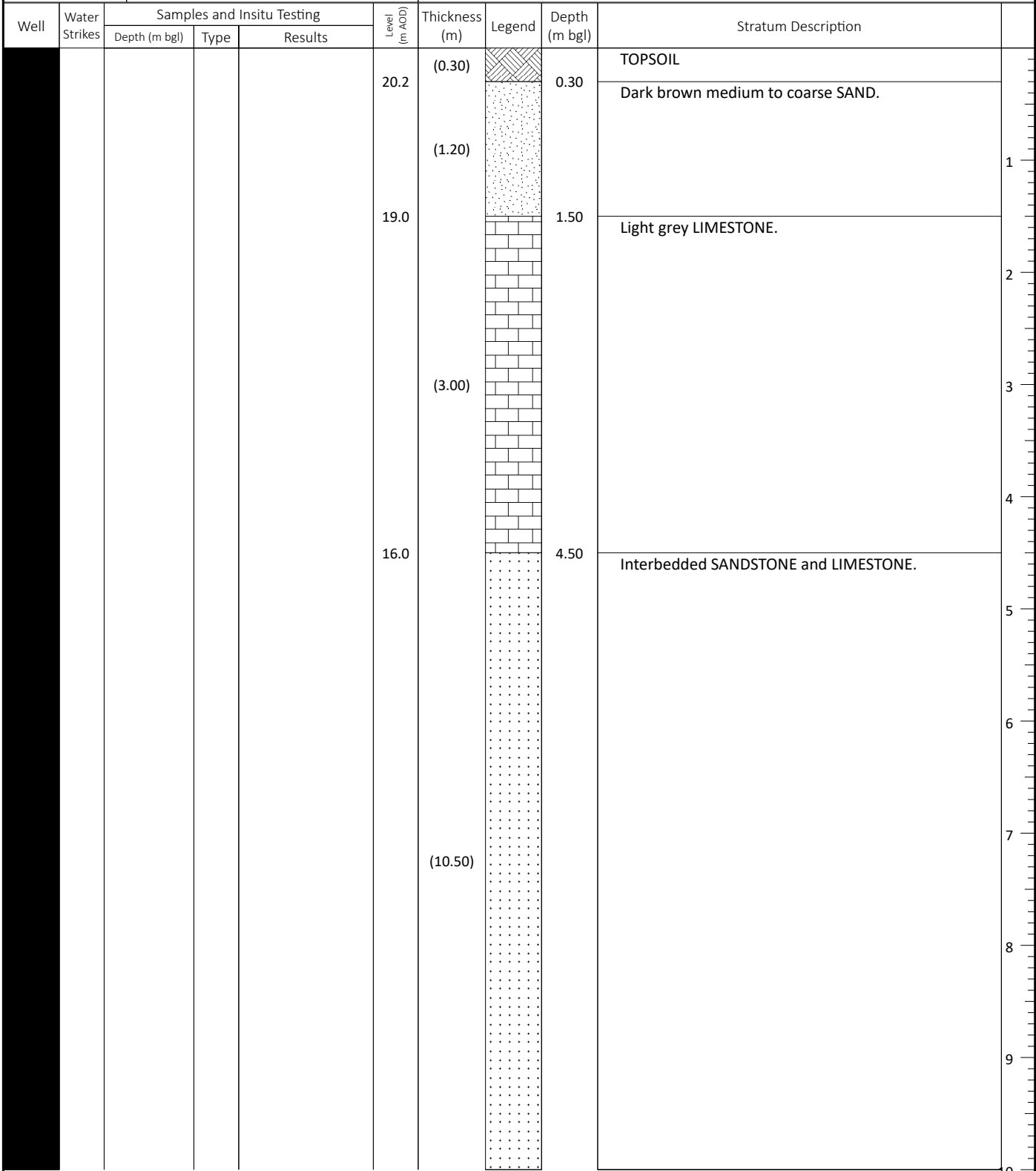
20.54

TJ

Location: Kiln Barn Road, East Malling, ME20 6QS

Down-the-hole-hammer. Rest groundwater level at 12.0m bgl. Driller's descriptions only.

Client: Ardent Consulting Engineers



Hole Details		Casing Details		Waterstrike (m bgl)					Standing/Chiselling (m bgl)				
Depth (m bgl)	Dia. (mm)	Depth (m bgl)	Dia. (mm)	Date	Depth Strike	Depth Casing	Depth Sealed	Rose to:	Time (mins)	From	To	Time	Remarks
17.00	200			26-10-2018	17.00			12.00	10				

4th Floor, Diamond House
 36-38 Hatton Garden
 London EC1N 8EB

East Malling Trust (Site B)
 Surface Water
 Drainage Strategy



Date 18/12/17
 File 182600 - SITE B - BULK CRATE

Designed by DWJP
 Checked by BC

Micro Drainage Source Control 2016.1

Model Details

Storage is Online Cover Level (m) 18.150

Cellular Storage Structure

Invert Level (m) 13.150 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 1.69600 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 1.69600

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1000.0	1000.0	3.200	1000.0	1448.0	3.300	0.0	1448.0

Appendix I
Drainage Strategy Plan

Appendix J
Kent County Council Pro-Forma

Drainage Strategy Summary



1. Site details	
Site/development name	SITE B, EAST MALLING
Address including post code	KILN BARN ROAD, EAST MALLING ME20 6AJ
Grid reference	E 571024 N 157671
LPA reference	
Type of application	Outline <input checked="" type="checkbox"/> Full <input type="checkbox"/> Discharge of Conditions <input type="checkbox"/> Other <input type="checkbox"/>
Has pre-application advice been sought from KCC?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
If so, KCC Reference Number:	
Pre-application Meeting Date:	
Site condition	Greenfield <input checked="" type="checkbox"/> Brownfield <input type="checkbox"/>

2. Existing drainage		Document/Plan where information is stated:
Total site area (ha)	11.26	N/A
Impermeable area (ha)	0	
Final discharge location	Infiltration <input checked="" type="checkbox"/> Watercourse <input type="checkbox"/> Sewer <input type="checkbox"/> Tidal reach/sea <input type="checkbox"/>	
Where applicable specify catchment runoff rates:	Greenfield runoff rates (l/s) Existing brownfield runoff rates (l/s)	
QBAR (l/s)		
1 in 1 year (l/s)		
1 in 30 year (l/s)		
1 in 100 year (l/s)		
3. Proposed drainage areas		Document/Plan where information is stated:
Impermeable area (ha)	Roof	
	Highway/road	
	Other paved areas	
	Total	5.83
Permeable area (ha)	Open space	2.43
	Other permeable areas	3.00
	Total	5.43
Final discharge location	Infiltration <input checked="" type="checkbox"/> Infiltration rate 6.7×10^{-3} m/s Watercourse <input type="checkbox"/> Sewer <input type="checkbox"/> Tidal reach/sea <input type="checkbox"/>	
Climate change allowance included in design	20% <input type="checkbox"/> 30% <input type="checkbox"/> 40% <input checked="" type="checkbox"/>	

4. Post-Development Discharge rates, with mitigation			Document/Plan where information is stated:
Describe development drainage strategy in general terms: DISCHARGE VIA DEEP BOREHOLE SOAKAWAYS			
(a) Soil type and discharge	Permeable <input checked="" type="checkbox"/> No off-site discharge i.e. infiltration <input type="checkbox"/>	Semi-permeable <input type="checkbox"/> Infiltration maximised, QBAR off-site <input type="checkbox"/>	Impermeable <input type="checkbox"/> Staged discharge <input type="checkbox"/>
(b) Controlled developed discharge rates (l/s)	1 in 1 year		N/A
	1 in 30 year		
	1 in 100 year		
	1 in 100 year + CC		
5. Discharge Volumes			Document/Plan where information is stated:
	Existing volume (m ³)	Proposed volume (m ³)	N/A
1 in 1 year			
1 in 30 year			
1 in 100 year			
1 in 100 year + CC			
6. Plans/Drawings			Document/Plan where information is stated:
A schematic of the drainage <u>strategy</u> has been included? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
A schematic of the drainage <u>network model</u> has been included? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

All information presented above should be contained within the attached Flood Risk Assessment, Drainage Strategy or Statement and be substantiated through plans and appropriate calculations.

Form completed by	PETER SPARHAM
Qualifications	BENG CENG MICE
Company	ARDENT
Telephone	0115 697 0940
Email	psparham@ardent-ce.co.uk
On behalf of (client's details)	EAST MALLING TRUST
Date	15/11/18.

Appendix K
Infiltration Test Results

Our Ref: JNR/TRL/AM/J13838

1st November 2018

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Dr L D Mockett BSc PhD PGDip FGS (Joint Managing Director)
Dr J Kelly BSc PhD DIC (Joint Managing Director)
S F Pratt BSc MSc CGeol FGS DIC
P J Sugden BSc MSc FGS
D Vooght BSc (Civ Eng) MSc (Non Executive)
A J Timms CEng MICE (Non Executive)
Co. Secretary J N Joseph
Consultant Dr D Petley BSc PhD DIC MHIT FGS
D Illingworth BSc FGS

For the attention of Peter Sparham
(By email: psparham@ardent-ce.co.uk)

Dear Peter,

Re: Borehole Soakaway Installation at: East Malling Site B, Ditton, Aylesford, Kent, ME20 6QA
National Grid Reference: TQ 71010 57676
Geology: Hythe Formation

1 Authority

Our authority for carrying out this work is contained in a Project Order form completed by Peter Sparham of Ardent Consulting Engineers, dated 19th October 2018. The form refers to our quotation ref. Q18-20117(a).

2 Background and Objectives

The object of the investigation was to drill boreholes to test for infiltration within the Hythe Formation. The borehole locations were specified to us by the Client. The site location is shown on the attached Figure 1.

3 Scope

This letter report presents our findings and test results. As with any site there may be differences in ground conditions between exploratory hole positions.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

Contamination issues are not considered in this report.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Limited believes are reliable. Nevertheless, Southern Testing Laboratories Limited cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Ardent Consulting Engineers and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

Recommendations contained in this report may not be appropriate to alternative development schemes.

4 Borehole Logs, Groundwater, and Soakage Test Results

Three 200mm diameter down-the-hole-hammer boreholes were drilled in the locations specified to us by the Client. The borehole locations are shown on the attached plan (Figure 2).

The materials encountered comprised a covering of sandy clays / clayey sands, overlying interbedded limestone and sandstone. The depth to the top of the limestone/sandstone was variable, and was found to be between 1.0 and 4.5m bgl. The intended depth of the boreholes was 25m bgl. However, the boreholes were terminated early at between 17.0 and 17.5m bgl due to the presence of groundwater. It is our understanding that the Environment Agency would require an unsaturated zone beneath the base of any working borehole soakaway.

Groundwater was encountered in the boreholes as follows:

BH ref	BH ground level (mAOD)	Depth of groundwater strike		Rest level of groundwater	
		mBGL	mAOD	mBGL	mAOD
BH1	19.08	15.50	+3.58	11.40	+7.68
BH2	20.54	17.00	+3.54	12.00	+8.54
BH3	18.13	17.50	+0.63	10.20	+7.93

Table 1: Groundwater observations.

The depth of the groundwater strike can be masked by the drilling methods, and so may not represent the actual level of groundwater beneath the site. However, the rest level of the groundwater before and after the soakage tests appear to be consistent between the three boreholes, and it would appear that the groundwater is at a level of about +8.00m AOD. This will need to be considered in the design of any borehole soakaways on this site.

A soakage test was undertaken in each borehole. The results of the testing are shown in the table below:

BH ref	Approximate soakage rate (litres/minute)	Water level during test (m bgl)
BH1	400	4.50
BH2	100	3.00
BH3	400	3.00

Table 2: Constant head borehole soakage results

After each test the water level receded down to the rest water levels shown in Table 1.

A suitable factor of safety should be applied for the design soakage rate.

If you have any queries or we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,



Thomas Lees MSci MSc CGeol FGS UK RoGEP Professional

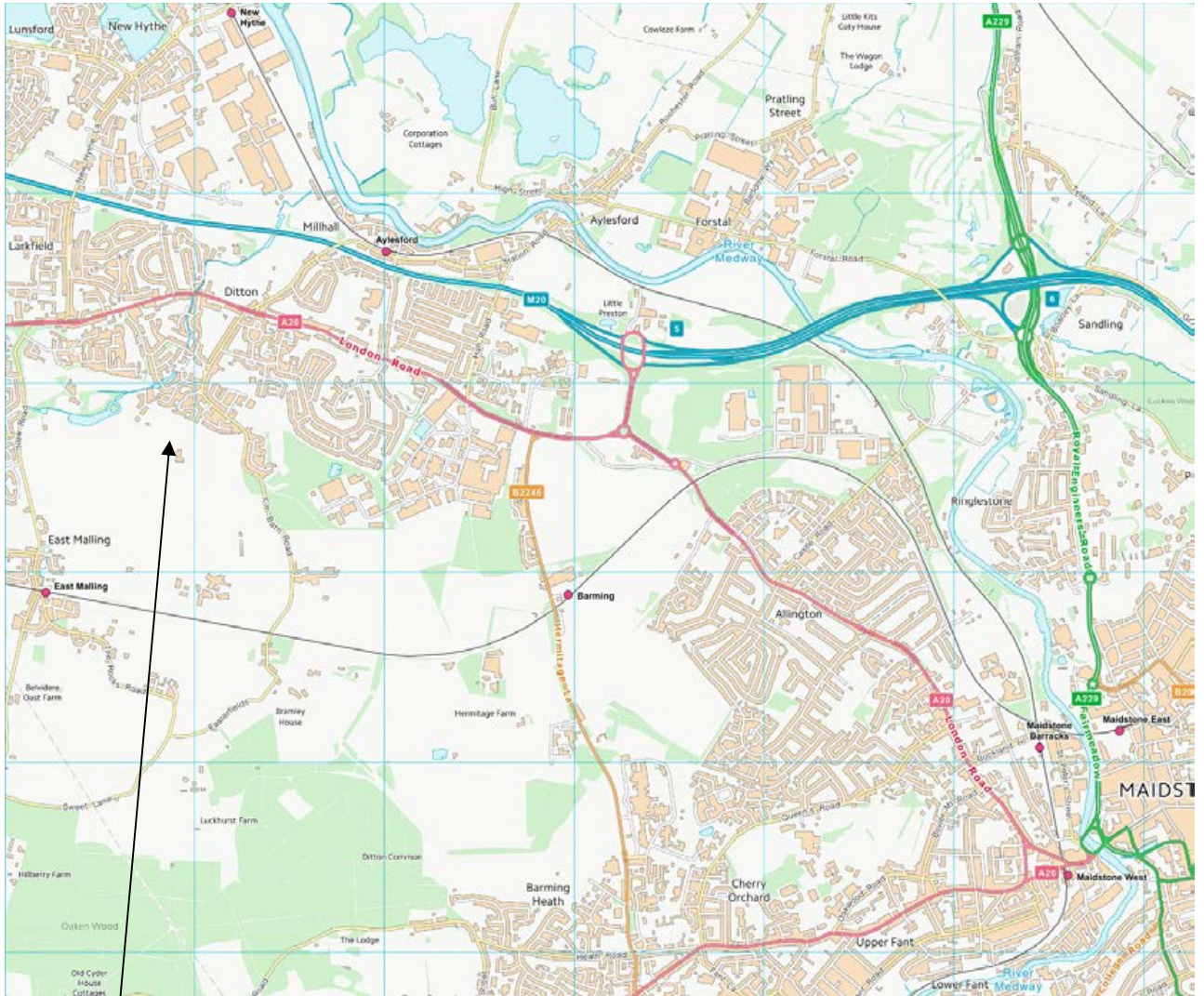
For and on behalf of

Southern Testing Laboratories Limited

DDI: 01342 333 136

Email: tlees@southerntesting.co.uk

encs



Site Location

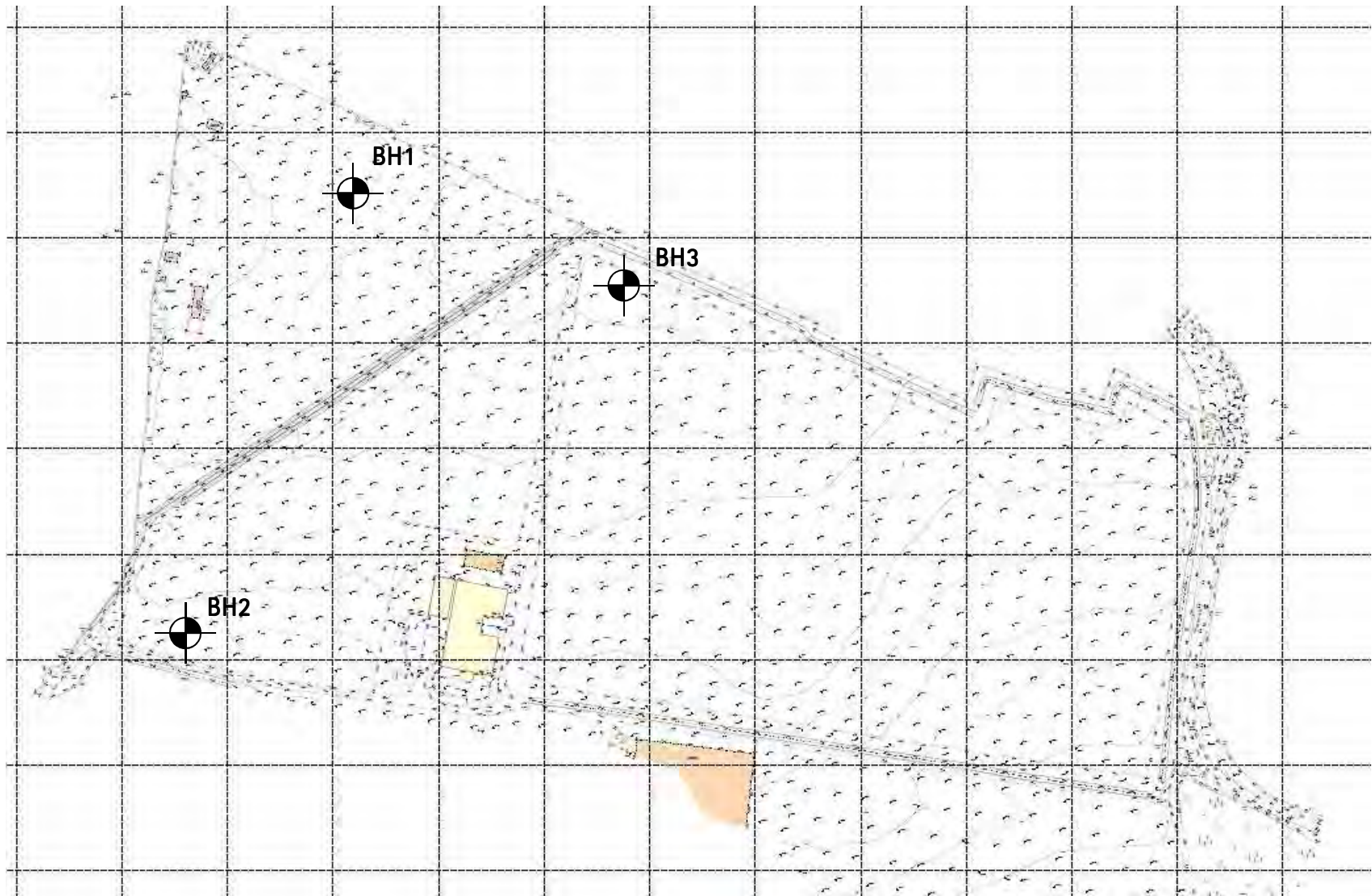
Contains Ordnance Survey Data © Crown Copyright and Database Right 2018

Site: East Malling Site B	STL: J13838	Fig No: 1
Date: 1 November 2018	Site Location Plan	



Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN





NB: Positions of Boreholes are only indicative unless dimensioned

Site: East Malling Site B

STL: J13838

Fig No: 2

Date: 1 November 2018

Borehole Location Plan

Project Name: East Malling Site B

Remarks:

Co-ordinates:

570860E - 157820N

Level:

19.08

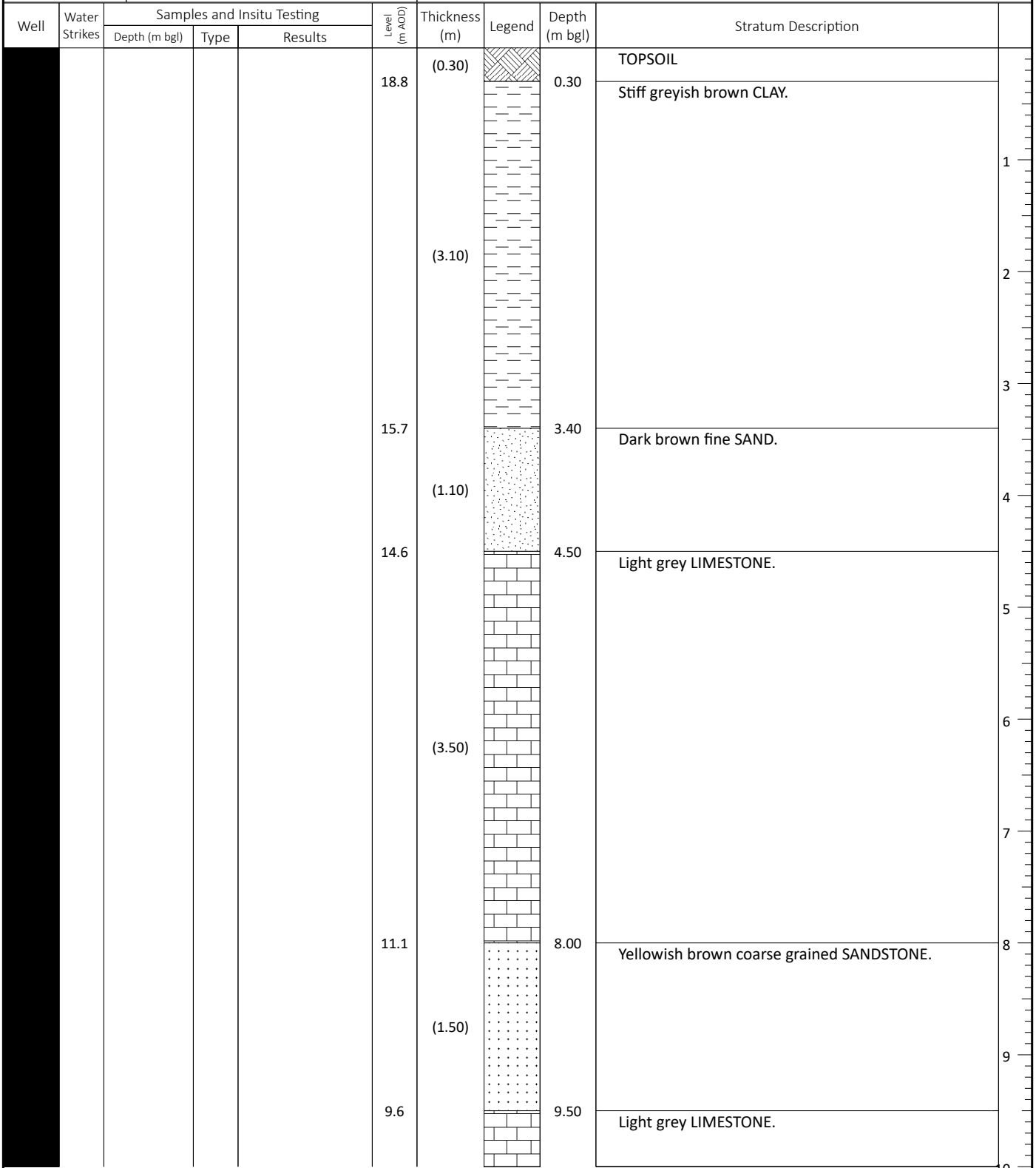
Logger:

TJ

Location: Kiln Barn Road, East Malling, ME20 6QS

Down-the-hole-hammer. Rest groundwater level at 11.4m bgl. Driller's descriptions only.

Client: Ardent Consulting Engineers



Hole Details		Casing Details		Waterstrike (m bgl)					Standing/Chiselling (m bgl)				
Depth (m bgl)	Dia. (mm)	Depth (m bgl)	Dia. (mm)	Date	Depth Strike	Depth Casing	Depth Sealed	Rose to:	Time (mins)	From	To	Time	Remarks
17.00	200			25-10-2018	15.50			11.40	10				