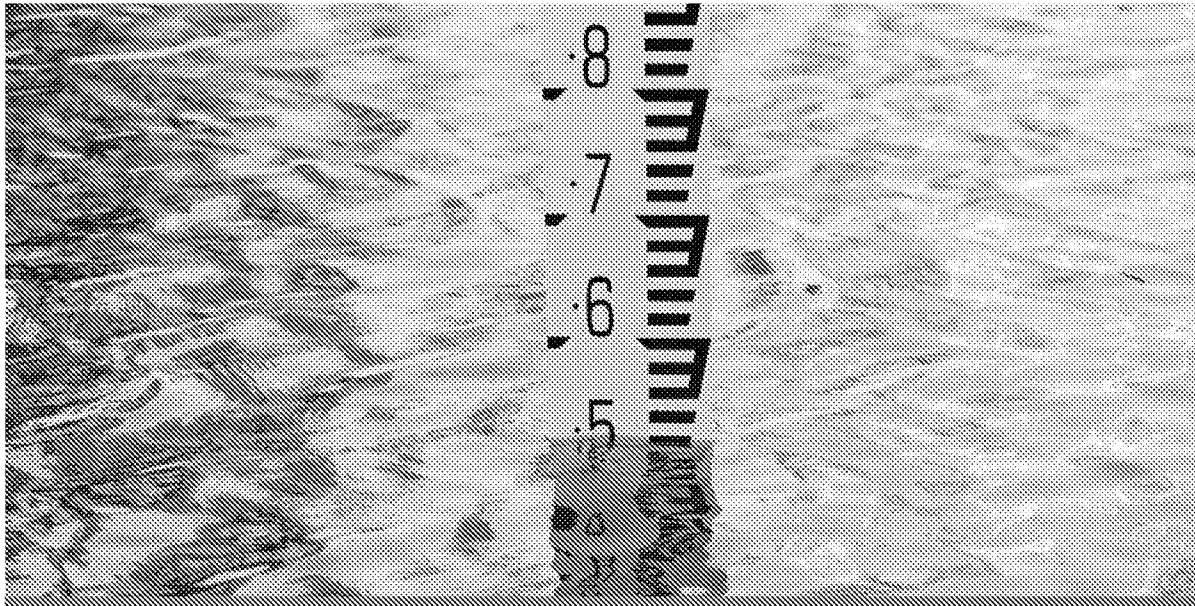




Flood Risk Assessment

47 The Ridings, East Preston, BN16 2TW

Client

Quinta Estates

129 Finchley Rd,
London
NW3 6HY

Ref: 10619

Date: May 2020

Consulting Engineers

GTA Civils Ltd

Gloucester House
66a Church Walk
Burgess Hill

West Sussex, RH15 9AS

Index

1	Introduction	2
2	Existing Site and Current Flood Conditions	3
3	Current Flood Conditions	4
4	Proposed Development & SuDS Strategy	6

Schedule of Appendices

A	Site Location Map & Aerial Photo
B	Environment Agency & SFRA Flood and Groundwater Maps
C	BRE 365 Soakage Testing and Groundwater Monitoring
D	Proposed Scheme Drawings Including Drainage Strategy
E	Micro Drainage Calculation Sheets
F	Drainage Management and Maintenance Plan

Issue	Issue date	Compiled	Checked
Preliminary Issue	07 May 2020	JP	MR
First Issue	15 May 2020	JP	MR

1 Introduction

- 1.1 This report has been prepared for Quinta Estates in relation to land at 47 The Ridings, East Preston, BN16 2TW and no responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.2 GTA Civils and Transport was appointed by its Client to provide a Flood Risk Assessment (FRA) to support the planning application as required by the Environment Agency and Arun District Council.
- 1.3 This report will take the form of a formal Flood Risk Assessment in accordance with the 2019 National Planning Policy Framework (NPPF) and current Planning Practice Guidance (PPG).

2 Existing Site and Current Flood Conditions

- 2.1 The application site lies within the village of East Preston, which is a residential area administered by Arun District Council (ADC). See the site location map and aerial view in Appendix A.
- 2.2 The site comprises a vacant plot to the south of a private residence occupying a double fronted plot.
- 2.3 A topographical survey of the existing site has been conducted, to a site datum, it is assumed. The site is all but flat with levels ranging between 19.6m at the northwest corner and 19.31m in the southeast corner. This is shown in Appendix D.
- 2.4 A small network of drains are located approximately 325m to the north and east of the site. These are partially culverted. There are no ponds or Main Rivers within this vicinity, according to the OS Explorer map. The drains flow broadly southwards into the English Channel, approximately 370m away.
- 2.5 Geology: the BGS online map shows that the site's solid geology is 'Lewes Nodular Chalk' River Terrace Deposits (sand, silt and clay) drift deposits overlying this. The site also overlies a 'Minor Aquifer - Intermediate' as shown on the EA's groundwater vulnerability map in Appendix C. (The site is removed from the nearest Groundwater Source Protection Zone).
- 2.6 A Site Investigation was carried out in November 2015. This confirms the drift (but refers to them as Raised Beach Deposits) but also mentions Brickearth (Aeolian Deposits), which extend above the Raised Beach Deposits. As the latter are predominantly cohesive, ie Clay with other particle sizes, this would indicate a low infiltration rate at shallow depth.
- 2.7 A soakage test (nominally to BRE 365) were carried out to a depth of 0.6m. The rate was calculated as 1.42×10^{-6} m/s. The result had to be extrapolated as the water level did not fall sufficiently within the test timescale.
- 2.8 A winter ground water monitoring exercise was undertaken between 13/11/15 and 08/01/16. The shallowest depth (at the end of the study) was 1.11m below ground level.
- 2.9 Public sewers: Southern Water's sewer records for this area (see Appendix B) show a foul main network under The Ridings. No surface water sewers serve this area. As there are no watercourses within the site it is apparent that infiltration (such as soakaways) is the only option for discharging surface water.

3 Current Flood Conditions

- 3.1 Tidal flooding: the site is removed from the coastal flood zone pattern – see Rivers and Seas Flood Map in Appendix C. This places the site in Flood Zone 1 (FZ1). Sites within Flood Zone 1 are susceptible to less than a 1 in 1000 chance of river or tidal flooding each year (or 0.1% AEP).
- 3.2 Fluvial flooding: the Environment Agency's (EA) Flood Map in Appendix C shows no fluvial flood patterns in this vicinity.
- 3.3 Sewer flooding: occurs due to limited capacity or blockage in the sewer system causing backing up of storm water and effluent. The Strategic Flood Risk Assessment (SFRA) commissioned by ADC shows a historical sewer flooding incident near to the site – refer to Map H in Appendix D.
- 3.4 Groundwater flooding: occurs when water levels in the ground rise above the surface. The SFRA does not show any registered historical groundwater flooding incidents at or near to the site. The SFRA's Map G1 shows that the site is outside the Groundwater Emergence Zone but is in the High Risk zone. As there is no proposed subterranean features such as basements or swimming pools it is contended that this risk is not significantly high on this site.
- 3.5 Surface water flooding: occurs when excess rainwater does not infiltrate into the ground, or is not intercepted by urban drainage systems, and instead flows across the surface.
- 3.6 The EA's 'medium chance' surface water flood map (see Appendix C) indicates that the site is clear of flooding in this scenario (1 in 100 years).
- 3.7 The EA's surface water depth flood map for a 'low chance' scenario ('1 in 1000 years' storm event) shows a wide overland flow route passing along the south of the site – refer to Appendix C. This joins with the deeper flow route in Sea Lane, which is at a lower elevation to the site. The next map shows the velocity (depth and direction) of flow. This shows that there is little definition to the flow's direction in this vicinity – and the speed is <0.25m/s within the site. This will be covered in the next section.
- 3.8 The SFRA does not register any historical flood incidents on this site.
- 3.9 Artificial sources: flooding from reservoirs, canals and docks. The EA's reservoir flooding map shows the site as being outside of areas designated as being at risk of flooding if a reservoir were to fail. There are no docks or canals in this area.

- 3.10 Based on the evidence presented in this section, it is clear that the site is at low risk of flooding from all sources in the 1 in 100 years storm. Only in the most extreme event (1 in 1000 years event) will there be an overland flow route affecting the southern edge part of the site. This will be dealt with via sustainable drainage design.

4 Proposed Development & SuDS Strategy

- 4.1 The planning application is for a building an infill dwelling house.
- 4.2 The site is in FZ1 and so does not need to pass the Sequential or Exception Tests.
- 4.3 The proposed ground floor's FFL shall be set at least 0.2m above ambient ground levels. The unit will be at low risk of flooding, and no flood mitigation measures are required.
- 4.4 The overland flow route identified on the EA's surface water flood map will be unimpeded by dwellings or other features – see the last image in Appendix E, which shows the EA's Surface Water Flood Map superimposed on to the proposed layout. As the unit will be raised well above ambient ground levels, it is clear that it will not flood in this extreme event.
- 4.5 As infiltration methods are the only option for discharging surface water off site (see section 2.9 above), it is proposed to discharge to ground via a gravel drive and a soakaway in the rear garden. This is shown on the Drainage Strategy Layout in Appendix E. The drive is are designed for the 1 in 10 years storm: in more intense events an overflow leads to the soakaway.
- 4.6 The combination of a 150mm deep gravel infiltration blanket and a 320mm deep cellular soakaway will hold the volume of the critical '1 in 100 years plus 40% climate change' storm. These structures have been sized using the lower of the 2 soakage rates, namely $1.42 \times 10^{-6} \text{m/s}$ (equal to 0.00511m/hr).
- 4.7 It is therefore proposed to use gravel and a modular soakaway for surface water to discharge to ground. The gravel will filter water. This treatment stage complies with CIRIA's guidance. Refer to Appendix D for the drainage strategy layout and Appendix E for the Micro Drainage calculation sheets.
- 4.8 Various sustainable drainage systems were considered to store the excess storm water:
- Green roofs: Not practical for this development due to the proposed steep roof pitches.
 - Ponds: These are not considered feasible in medium-high permeability soils.
 - Rainwater harvesting tanks: The use of rainwater harvesting tanks on a residential development where each householder would be required to maintain their own tank is not considered to be commercially viable.

- 4.9 Exceedance flows: Exceedance flows: by spreading the infiltration structures wide across the site it is hard to imagine how these are going to get blocked up; any resulting exceedance flow would flow much as per the EA's Low Chance surface water flood map, ie to the east into Sea Lane.
- 4.10 Foul drainage: it is proposed to discharge the foul water from the dwelling into the existing foul sewer in The Ridings. This will be subject to applications to Southern Water under Section 106 of the Water Industry Act 1991.

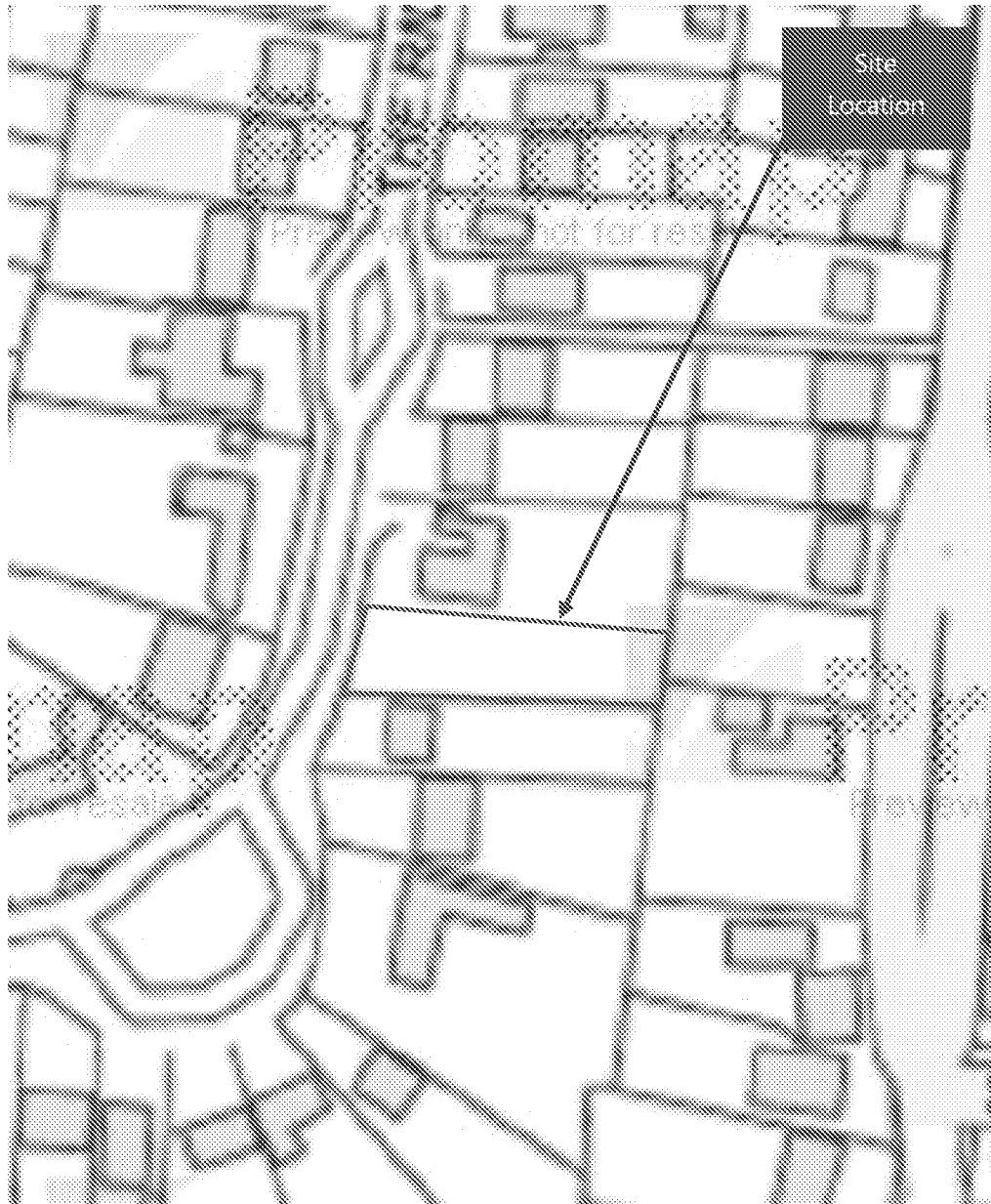
Conclusion:

This development will not increase the flood risk either on this site or to neighbouring properties - and so complies with the 2019 NPPF and current PPG.

- End of Report -

Appendix A

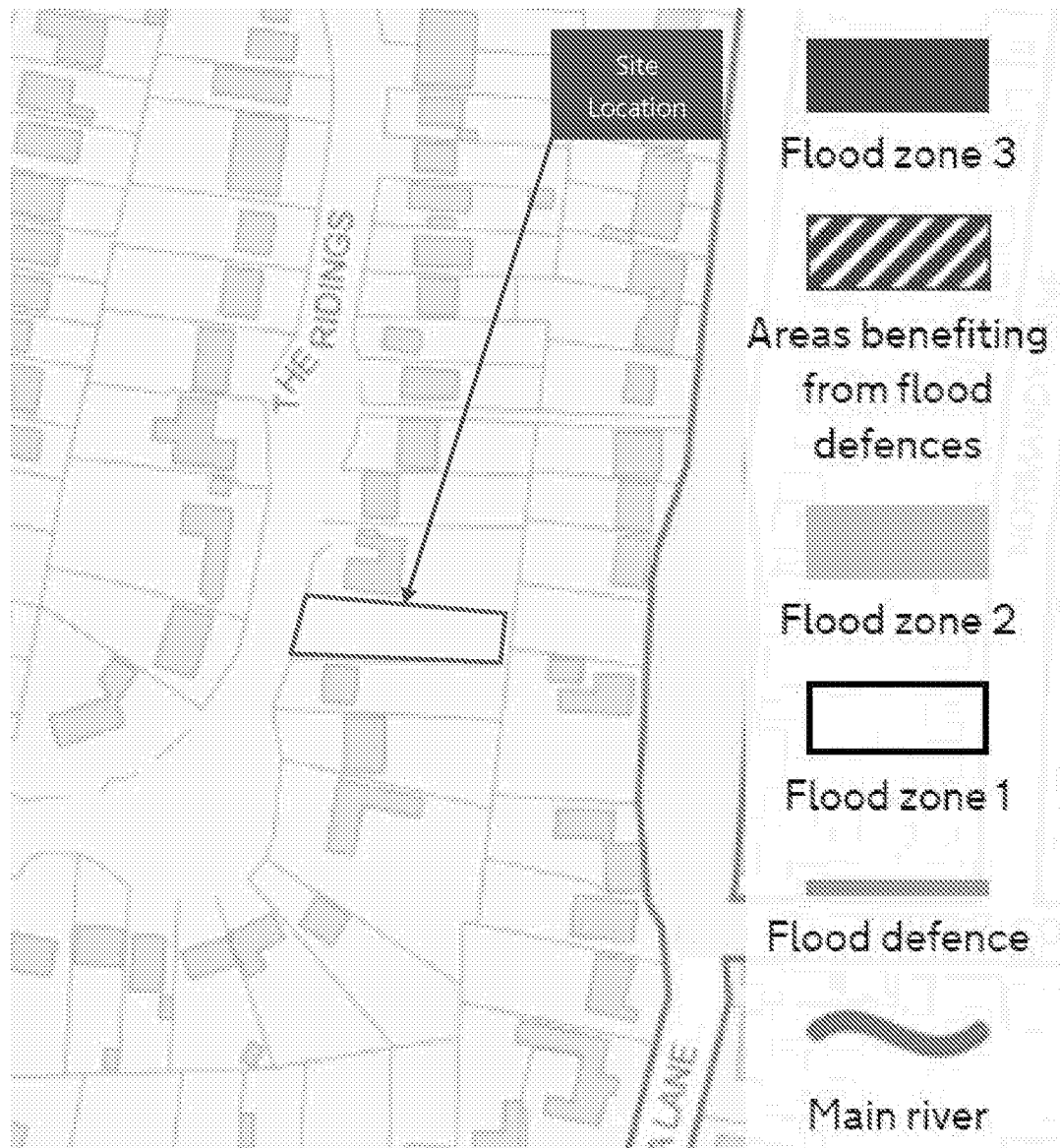
Site Location Map & Aerial Photo





Appendix B

Environment Agency and SFRA Flood & Groundwater Maps



EA's Online Flood Map for Planning (Rivers and Seas)

The site is situated within Flood Zone 1



Surface water flood risk: water depth in a low risk scenario
Flood depth (millimetres)

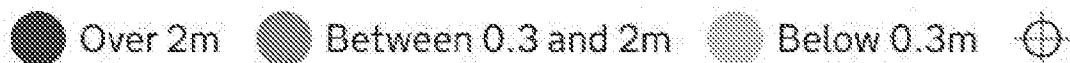


EA's Online Surface Water Flood Depth Map in the 'Low Risk Scenario'
(1 in 1000 years storm event)

The site is largely clear of this source of flooding, although the south of the site is susceptible to flooding up to a depth of 300mm



Reservoir flood risk: flood water depth



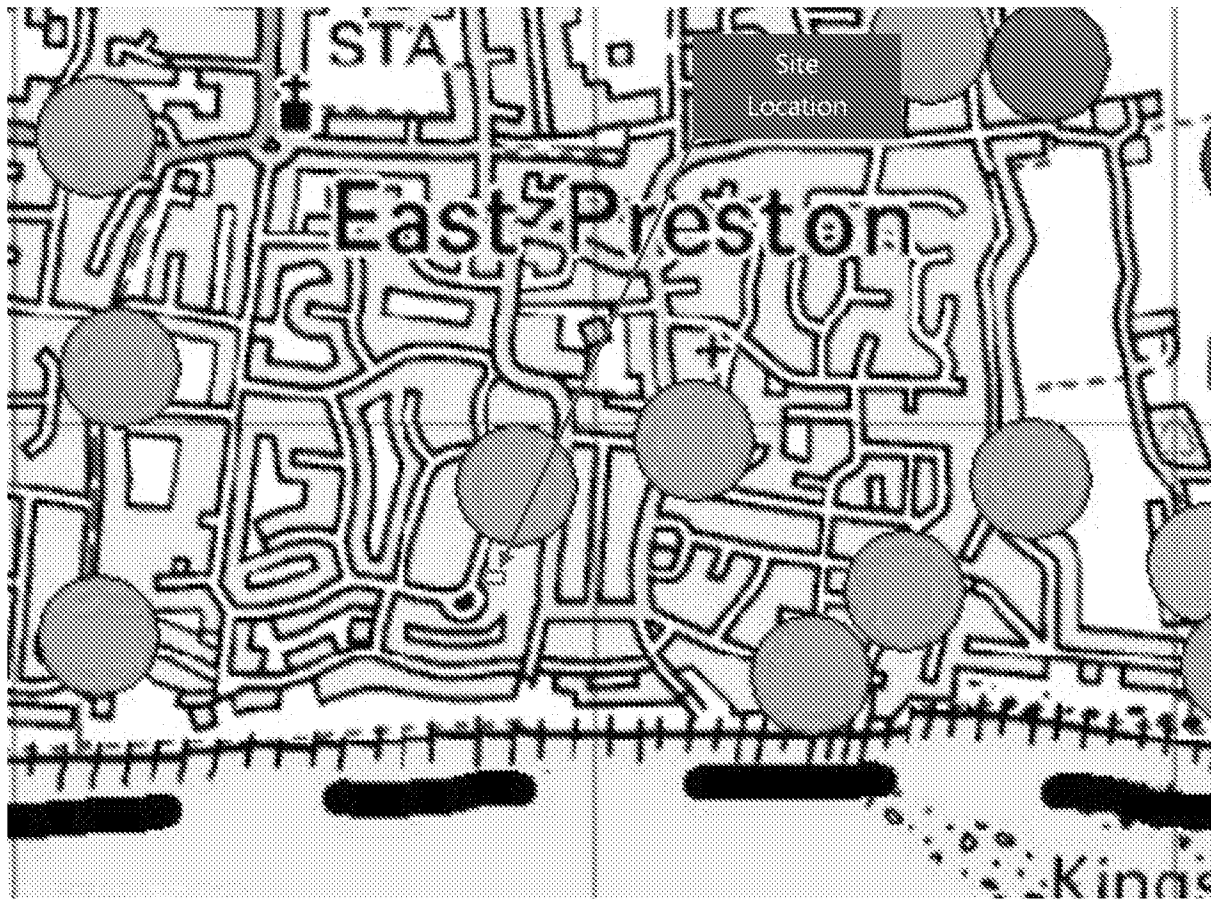
EA's Online 'Risk of Flooding from Reservoirs' Map

The site is removed from this source of flooding



EA's Historic Flood Map

This site is removed from the nearest affected area



Historic Flood Events - Points

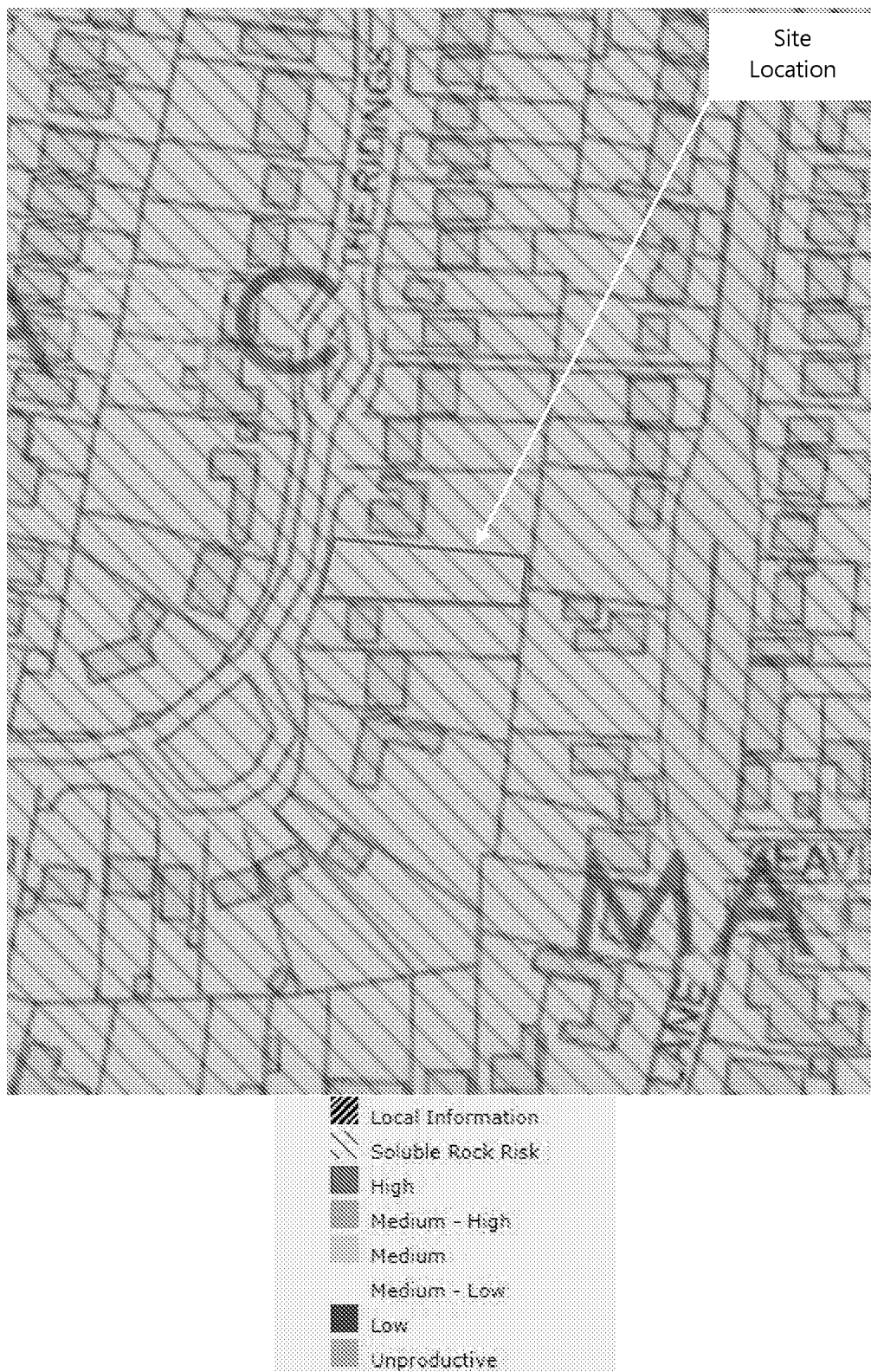
- Coastal
- Tidal
- Fluvial
- Surface Water
- Sewer
- Failure
- Unknown

Historic Flood Events - Areas

- Coastal
- Tidal
- Fluvial
- Surface Water
- Unknown

Enlarged Excerpt from SFRA's Map H: Historical Flood Events

The site is close to a nearby sewer failure point 'flood event' - but is not in or near to any areas of flood events



EA's Groundwater Vulnerability Map

This site overlies a 'Medium – High' Aquifer



EA's Source Protection Zone Map

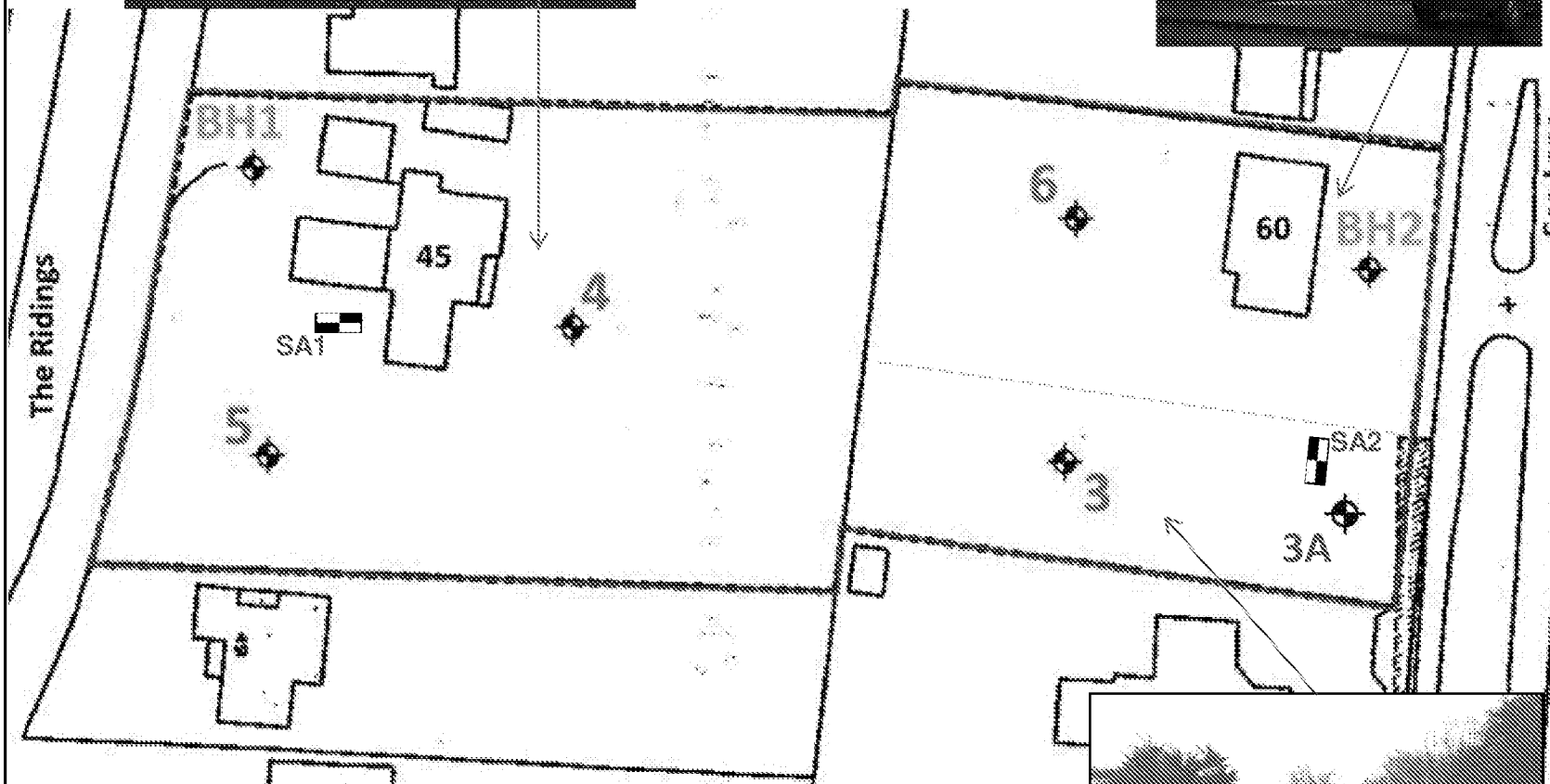
The site is removed from all Source Protection Zones

Appendix C

BRE 365 Soakage Testing and Groundwater Monitoring

Two soakage tests were performed in general accordance with BRE Digest 365 at depths of 0.6m to assess the infiltration characteristics. Using the data obtained soil infiltration rates of between $1.42\text{--}2.82 \times 10^{-6} \text{ m/s}$ have been determined. The results are included in Appendix 2 and summarised in Table 2 below.

Table 2 - Soil Infiltration Rates f , m/s	
Location	Soil Infiltration Rates f , m/s
SA1	1.42×10^{-6}
SA2	2.82×10^{-6}



Legend:

-  Borehole Location
-  Trial Pit Location
-  Site Boundary



Title: Site Layout Plan

Dwg No: 15/10581/1

Drawn by: GO

Client: Jennifer Shulman

Site: 45 The Ridings/60 Sea Lane, East Preston

Job Ref: 15/10581/GO

Scale: NTS

Revision: 2

Issue Date: 08/01/2016



ALBURY S.I. LTD

Miltons Yard, Petworth Road,
Witley, Surrey GU8 5LH
www.alburysi.co.uk





ALBURY S.I. LTD

**Geotechnical and
Environmental Consultants**

Miltons Yard, Petworth Road,
Witley, Surrey GU8 5LH

T: 01428 684 836

F: 01428 685 261

info@alburysl.co.uk

www.alburysl.co.uk

Our Ref: 15/10581/GO/atk

8th January 2016

Mrs Jennifer Shulman
GH Canfields LLP
129 Finchley Road
London
NW3 6HY

Dear Mrs Shulman

45 The Ridings & 60 Sea Lane, East Preston

We refer to your instruction to undertake long-term groundwater level monitoring at the above site and shallow depth permeability testing. Please find below the results of the additional monitoring undertaken on the 14th December 2015, 7th and 8th January 2016.

Table 1 - Groundwater Monitoring of Standpipes		
Date of Visit	Monitoring Position	
	BH1	BH3A
13/11/2015	2.18	-
20/11/2015	1.56	1.53
14/12/2015	1.61	1.34
07/01/2016	1.13	0.71
08/01/2016	1.11	0.80

A visit to site was made on the 6th January, 2016, where two test pits were constructed, in accordance with the instructions of your drainage engineer, to depths of 0.6m in order to carry out testing in accordance with BRE Digest 365. At each location two cycles were completed between the 6th and 8th January, 2016. The results of this work are included with this letter together with the trial pit logs and a plan indicating their positions. Using the data obtained soil infiltration rates of between $1.42\text{--}2.82 \times 10^{-6}$ m/s have been determined and these are summarised below.

Cont...

Directors

K J Clark BSc Hons

G C D Owens BSc MSc FGS MEnvSc

Registered Office

Beechey House, 87 Church Street, Crowthorne RG45 7AW

Registered in England No. 2702786





Table 2 – Soil infiltration rates <i>f</i> , m/s	
SA1	1.42×10^{-6}
SA2	2.82×10^{-6}

We trust the information provided in the above paragraphs is of use to you. Should you require any further assistance please do not hesitate to contact the undersigned. Our invoice for these works is enclosed. An additional return monitoring visit will be undertaken in February as per your request.

Yours faithfully

A handwritten signature in black ink, appearing to read 'G. Owens'.

George Owens BSc MSc FGS MEnvSc
Director
george.owens@alburysl.co.uk

cc. Ian Finlay

Enc.
Limitations
Soakaway Results
Trial Pit Logs
Site Plan

ALBURY S.I. LTD
Geotechnical & Environmental

Contract	Sea Lane, East Preston
Report Ref	15/10581/GO
Test Location	SA1 - Cycle 1

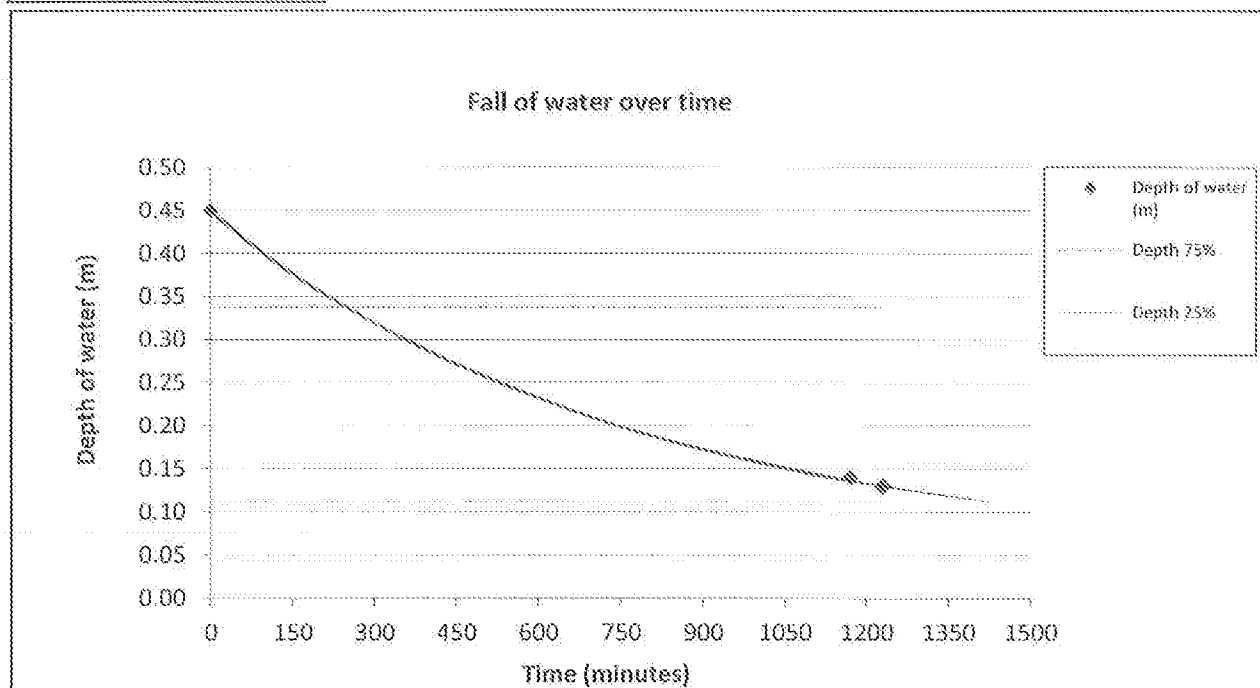
[illegible]

Fit Dimensions (m)

Length	1.00
Width	0.30
Depth	0.60

Remarks:

1. Test undertaken in general accordance with BRE Digest 365.
2. Trial pit was not filled with aggregate for test
3. Test did not complete within the time - infiltration rate extrapolated



V_{p75-25}	Effective depth storage volume of water in trial pit between 75% and 25% effective depth	0.0675
α_{p50}	Internal surface area of trial pit up to 50% effective depth and including base	0.885
t_{p75-25}	Time for water level to fall from 75% to 25% effective depth	1000

Soil Infiltration Rate (m/sec) <i>f</i>	1.27E-06	(Extrapolated Value)
---	----------	----------------------

ALBURY S.L. LTD
Geotechnical & Environmental

Contract	Sea Lane, East Preston
Report Ref	15/10581/GO
Test Location	SA2 - Cycle 1

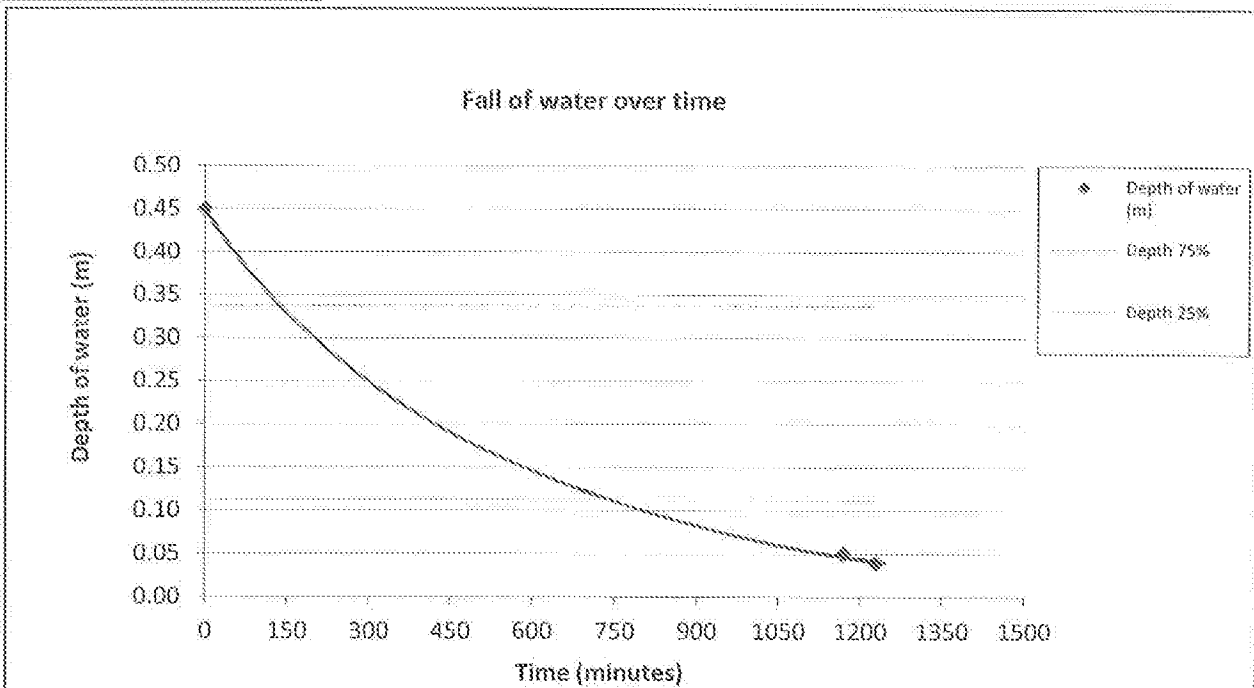
[illegible]

Fit Dimensions (m)

Length	1.00
Width	0.30
Depth	0.60

Remarks:

1. Test undertaken in general accordance with BRE Digest 365
2. Trial pit was not filled with aggregate for test



V_{p75-25}	Effective depth storage volume of water in trial pit between 75% and 25% effective depth	0.0675
α_{p50}	Internal surface area of trial pit up to 50% effective depth and including base	0.885
t_{p75-25}	Time for water level to fall from 75% to 25% effective depth	600

Soil Infiltration Rate (m/sec) f	2.12E-06
----------------------------------	----------

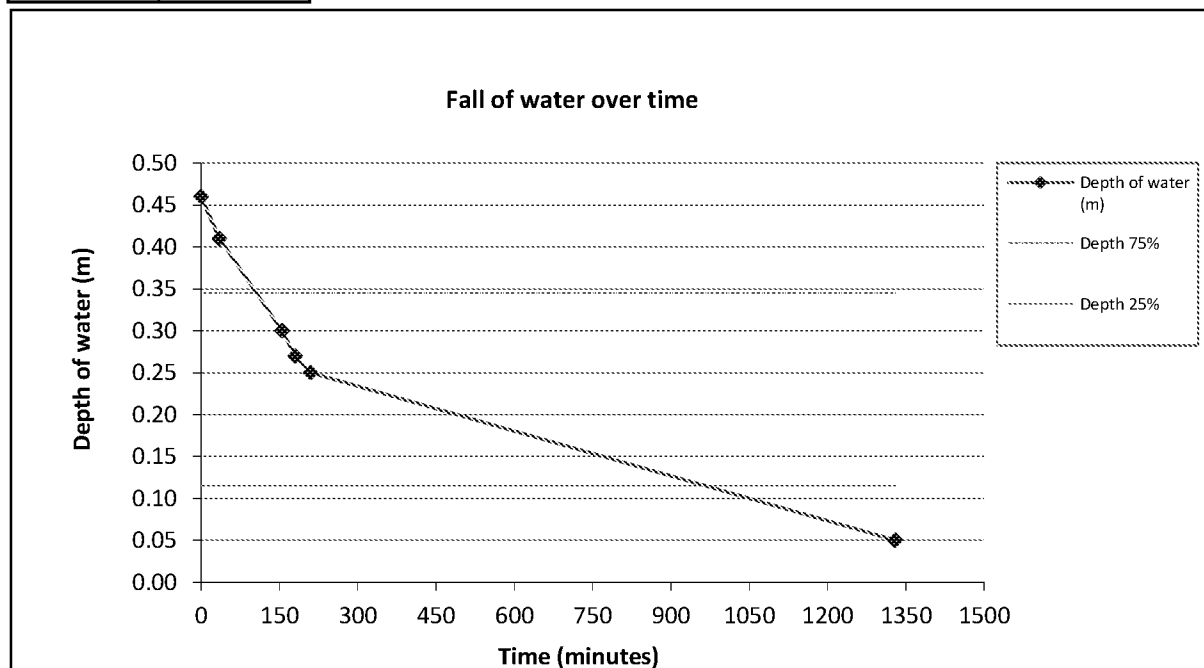
ALBURY S.I. LTD
Geotechnical & Environmental

Contract	The Ridings, East Preston
Report Ref	15/10581/GO
Test Location	SA1 - Cycle 2

[illegible]

Length	1.00
Width	0.30
Depth	0.60

1. Test undertaken in general accordance with BRE Digest 365
2. Trial pit was not filled with aggregate for test



V_{p75-25}	Effective depth storage volume of water in trial pit between 75% and 25% effective depth	0.069
α_{p50}	Internal surface area of trial pit up to 50% effective depth and including base	0.898
t_{p75-25}	Time for water level to fall from 75% to 25% effective depth	900

Soil Infiltration Rate (m/sec) <i>f</i>	1.42E-06
---	----------

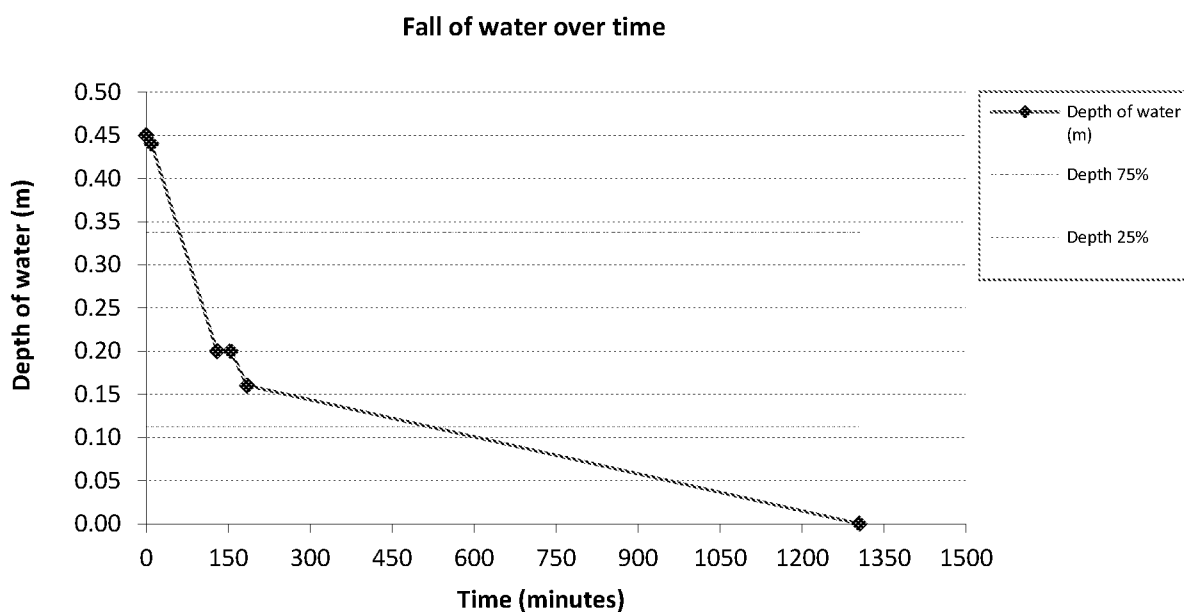
ALBURY S.I. LTD
Geotechnical & Environmental

Contract	Sea Lane, East Preston
Report Ref	15/10581/GO
Test Location	SA2 - Cycle 2

[illegible]

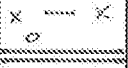
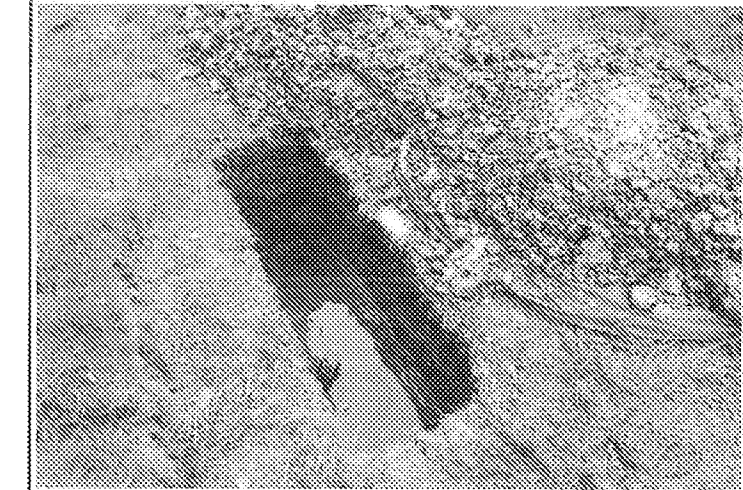
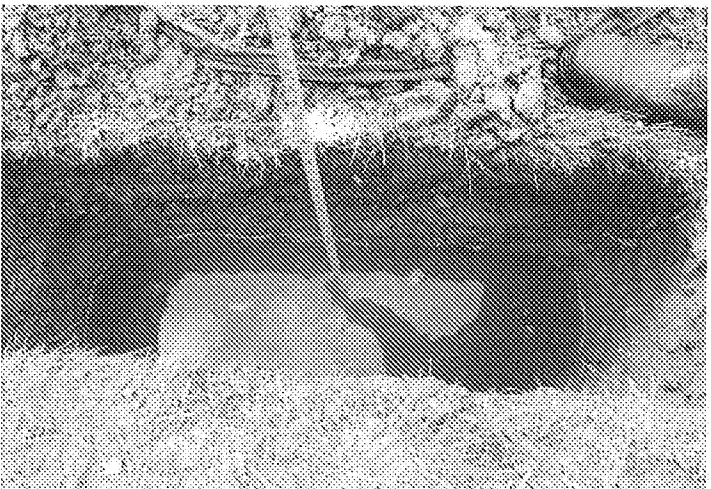
Length	1.00
Width	0.30
Depth	0.60

1. Test undertaken in general accordance with BRE Digest 365
2. Trial pit was not filled with aggregate for test

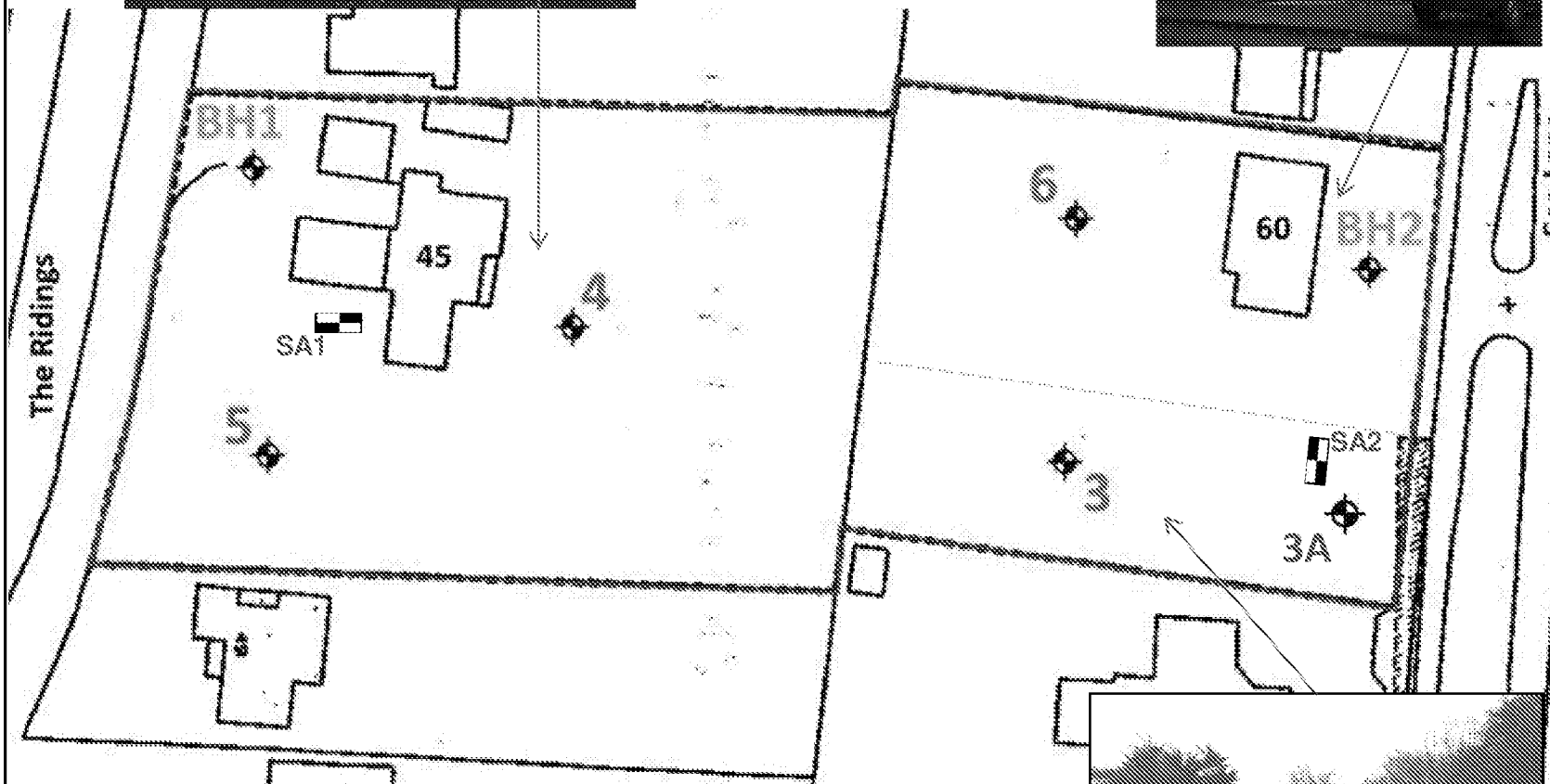


V_{p75-25}	Effective depth storage volume of water in trial pit between 75% and 25% effective depth	0.0675
α_{p50}	Internal surface area of trial pit up to 50% effective depth and including base	0.885
t_{p75-25}	Time for water level to fall from 75% to 25% effective depth	450

Soil Infiltration Rate (m/sec) <i>f</i>	2.82E-06
---	----------

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				Trial Pit		SA1			
Contract		The Ridings/Sea Lane, East Preston				Report Ref		15/10581/GO	
Client		Mrs Jennifer Shulman				Date		06/01/2016	
Site Address		45 The Ridings, East Preston, West Sussex BN16 2TW				Ground Level			
Type of excavator		Manual		Water level after completion, m					
Water strikes, m		Pit Dimensions, m		Ease of excavation, m					
1 0.60 (seep)		Length 1.00		Very easy		Difficult			
2		Breadth 0.30		Moderate		GL-0.60		Very hard	
Remarks Soakaway testing carried out in general accordance with BRE Digest 365									
Samples or tests		Shear Strength kPa	Depth	Legend	Strata Description				
Type	Depth, m								
D	0.10		0.25		MADE GROUND (brown sandy CLAY with roots and occasional brick) Brown very silty CLAY with occasional flint gravel				
D	0.50		0.60						
					 				

Sample Code: U - 100mm diameter B - Large Disturbed D - Small Disturbed W - Water Sample T - Tube Liner



Legend:

-  Borehole Location
-  Trial Pit Location
-  Site Boundary



Title: Site Layout Plan

Dwg No: 15/10581/1

Drawn by: GO

Client: Jennifer Shulman

Site: 45 The Ridings/60 Sea Lane, East Preston

Job Ref: 15/10581/GO

Scale: NTS

Revision: 2

Issue Date: 08/01/2016



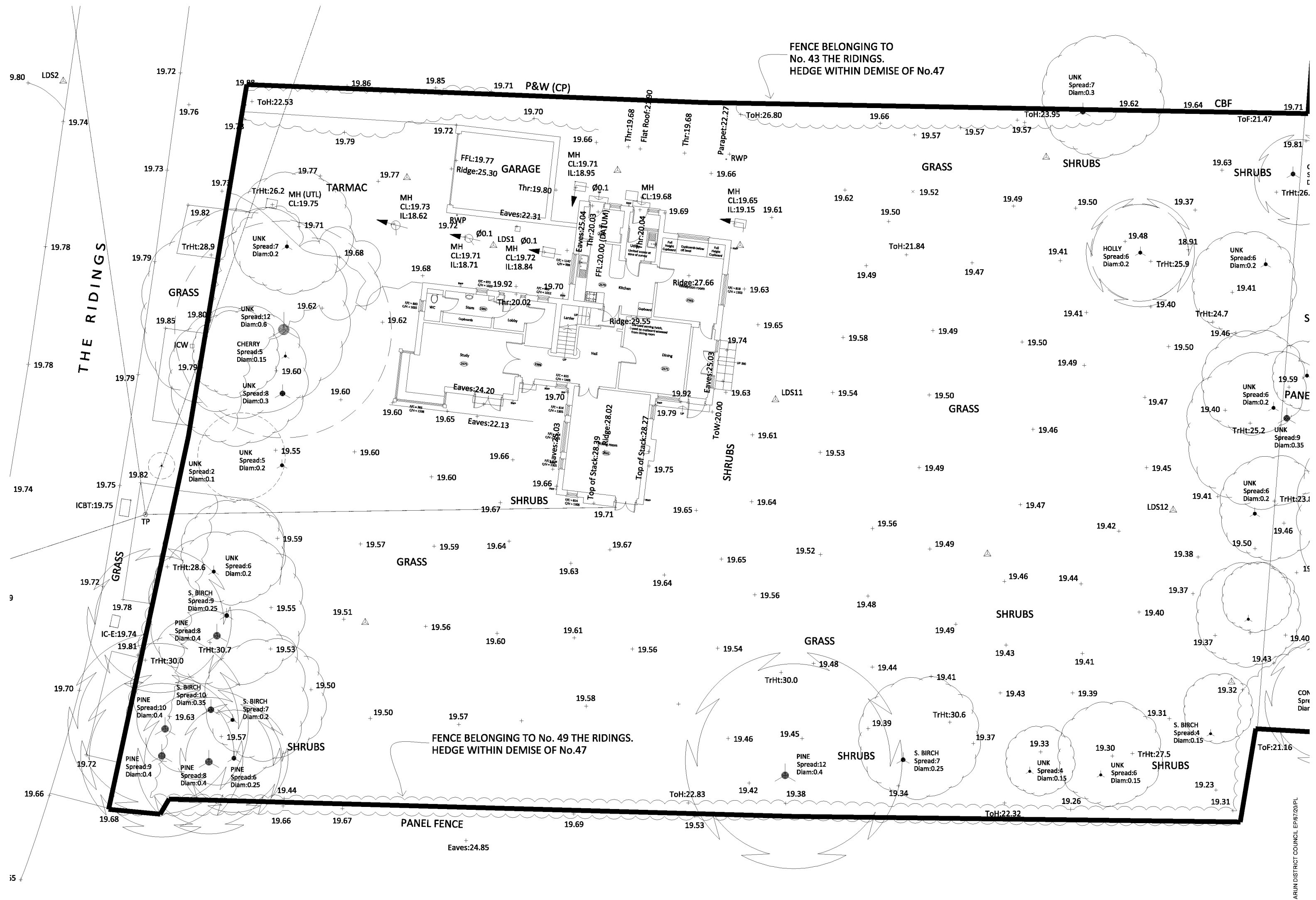
ALBURY S.I. LTD

Miltons Yard, Petworth Road,
Witley, Surrey GU8 5LH
www.alburysi.co.uk



Appendix D

Proposed Scheme Drawings Including Drainage Strategy



NOTES
WRITTEN DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALE, AND
ARE TO BE CHECKED ON SITE PRIOR TO COMMENCING WORK.
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER
DOCUMENTS RELATING TO THIS PROJECT.
ANY DISCREPANCIES ARE TO BE REFERRED IMMEDIATELY TO THE
PROJECT DESIGNER.
THIS DRAWING IS COPYRIGHT, AND SHOULD NOT BE USED OR
REPRODUCED WITHOUT PERMISSION.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE
WITH THE BUILDING REGULATIONS.

THE RIDINGS

DRIVEWAY

HEDGE

EXISTING SHRUBS
AND BUSHES
REMOVED TO FORM
NEW ACCESS

PROPOSALS FOR 45 THE
RIDINGS AS SHOWN ON
SEPARATE PLANNING
APPLICATION

NEW 1.8m HIGH CLOSE
BOARDED FENCE

NEW ENTRANCE DRIVE
& TURNING AREA

EXISTING MATURE
TREES, SHRUBS AND
BUSHES RETAINED

EXISTING FENCE LINE PARTLY
ASSUMED (CONCEALED BY
DENSE VEGETATION)

REV.	DESCRIPTION	DATE
------	-------------	------

PROJECT	PLOT ADJACENT TO 45 THE RIDINGS EAST PRESTON WEST SUSSEX BN16 2TW	
---------	--	--

DRAWING TITLE	PROPOSED SITE LAYOUT
---------------	----------------------

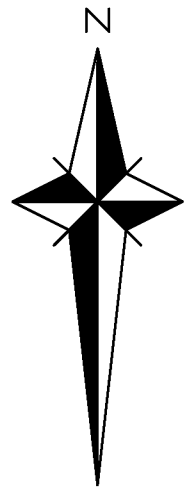
CLIENT	MRS J B SHULMAN
--------	-----------------

SCALE	DRAWN BY	DATE
1:200 @A3	PLB	APR 20

DWG NO	935/PO3	REV.
--------	---------	------

Unit 3b Woodhorn Business Centre
Woodhorn Lane
Oving Chichester
West Sussex PO20 2BX
10173 Tel 01243 774764
www.sloaneandbrown.co.uk

CHARTERED BUILDING SURVEYORS
**SLOANE
&
BROWN**
ARCHITECTURAL SERVICES



New connection into existing
FW sewer via swept 45 degree
branch. Contractor to
determine depth on site

Connection subject to
Southern Water Approval

Porous Driveway

Driveway make up

Reinforced / Retained Gravel
(Netpave or Similar) - 50mm
Terram 1000 Geotextile
Stone sub-base within geo-cellular
confinement (Root Protection) system to allow
for attenuation and soakage - 200mm
Depth - 0.15m
Area - 88m²

Cellular Soakaway
9m x 5m x 0.4m DEEP
Min Ground Level 19.48
Top of Tank Level 18.90
Base of Tank Level 18.50

Any excavations within RPA to be carried
out by hand and under the supervision
of the Arboricultural Consultant

DESIGN NOTES

1. SOAKAWAY DESIGN BASED ON 1 IN 100 YR STORM + 40% AND INFILTRATION RATE OF 1.42 X 10⁻⁶m/s. CONTRACTOR TO VERIFY RATES AT LOCATION OF SOAKWAYS USING BRE 365 SOAKAWAY TEST METHOD
2. DRAIN POINTS AND LOCATIONS TO BE CONFIRMED BY ARCHITECT.
3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.
4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.
2. Tender or billing drawings shall not be used for construction or the ordering of materials.
3. Do not scale. All dimensions and levels to be site confirmed.
4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements
5. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.
6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.

LEGEND

	Existing Foul Drainage
	Private Foul Drainage
	Private Storm Drainage
	Soil and Vent Pipe
	FAC
	FIC
	SAC
	SIC
	SIC CP
	Permeable Driveway Construction using cellular confinement system to protect tree roots
	Cellular Soakaway

P2	Layout amended	15/05/20	JP	MR
P1	Initial Issue	05/05/20	LT	MR
Rev	Amendments	Date	Dsn	Chk

Status	PRELIMINARY			
Client	JENNIFER SHULMAN			
Architect				
Project	45-47 THE RIDINGS EAST PRESTON			
Title	PROPOSED DRAINAGE STRATEGY			
Date	MAY 2020	Scale @ A2	1:200	
Clients Ref.		Project Ref.	10619	



Gloucester House, 66a Church Walk,
Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number	10619/1060	Rev.	P2
----------------	------------	------	----

Appendix E

Micro Drainage Calculation Sheets

GTA Civils Ltd				Page 1	
Gloucester House		47 The Ridings			
66a Church Walk		30% Vods Inf Blanket			
Burgess Hill, EN43 6LE		1 in 10 years			
Date 05/05/2020		Designed by LT			
File Drivewa Stone Soakaway		Checked by MR			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period</u>					
Half Drain Time : 464 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	19.539	0.039	0.0	1.0	O K
30 min Summer	19.557	0.057	0.1	1.5	O K
60 min Summer	19.576	0.076	0.1	2.0	O K
120 min Summer	19.594	0.094	0.1	2.5	O K
180 min Summer	19.603	0.103	0.1	2.7	O K
240 min Summer	19.608	0.108	0.1	2.8	O K
360 min Summer	19.612	0.112	0.1	3.0	O K
480 min Summer	19.613	0.113	0.1	3.0	O K
600 min Summer	19.614	0.114	0.1	3.0	O K
720 min Summer	19.614	0.114	0.1	3.0	O K
960 min Summer	19.613	0.113	0.1	3.0	O K
1440 min Summer	19.607	0.107	0.1	2.8	O K
2160 min Summer	19.597	0.097	0.1	2.6	O K
2880 min Summer	19.586	0.086	0.1	2.3	O K
4320 min Summer	19.566	0.066	0.1	1.7	O K
5760 min Summer	19.553	0.053	0.1	1.4	O K
7200 min Summer	19.546	0.046	0.1	1.2	O K
8640 min Summer	19.541	0.041	0.1	1.1	O K
10080 min Summer	19.537	0.037	0.0	1.0	O K
15 min Winter	19.546	0.046	0.1	1.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	89.024	0.0	19		
30 min Summer	59.849	0.0	33		
60 min Summer	39.413	0.0	62		
120 min Summer	23.812	0.0	122		
180 min Summer	17.737	0.0	182		
240 min Summer	14.290	0.0	240		
360 min Summer	10.505	0.0	352		
480 min Summer	8.441	0.0	406		
600 min Summer	7.318	0.0	466		
720 min Summer	6.190	0.0	528		
960 min Summer	4.959	0.0	664		
1440 min Summer	3.522	0.0	938		
2160 min Summer	2.640	0.0	1340		
2880 min Summer	2.107	0.0	1728		
4320 min Summer	1.530	0.0	2424		
5760 min Summer	1.218	0.0	3112		
7200 min Summer	1.019	0.0	3816		
8640 min Summer	0.882	0.0	4576		
10080 min Summer	0.781	0.0	5248		
15 min Winter	89.024	0.0	18		
©1982-2019 Innovyze					

GTA Civils Ltd				Page 2	
Gloucester House		47 The Ridings			
66a Church Walk		30% Vods Inf Blanket			
Burgess Hill, EN43 6LE		1 in 10 years			
Date 05/05/2020		Designed by LT			
File Drivewa Stone Soakaway		Checked by MR			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	19.566	0.066	0.1	1.8	O K
60 min Winter	19.588	0.088	0.1	2.3	O K
120 min Winter	19.609	0.109	0.1	2.9	O K
180 min Winter	19.619	0.119	0.1	3.1	O K
240 min Winter	19.624	0.124	0.1	3.3	O K
360 min Winter	19.630	0.130	0.1	3.4	O K
480 min Winter	19.631	0.131	0.1	3.5	O K
600 min Winter	19.631	0.131	0.1	3.5	O K
720 min Winter	19.630	0.130	0.1	3.4	O K
960 min Winter	19.628	0.128	0.1	3.4	O K
1440 min Winter	19.618	0.118	0.1	3.1	O K
2160 min Winter	19.600	0.100	0.1	2.7	O K
2880 min Winter	19.583	0.083	0.1	2.2	O K
4320 min Winter	19.556	0.056	0.1	1.5	O K
5760 min Winter	19.544	0.044	0.1	1.2	O K
7200 min Winter	19.538	0.038	0.0	1.0	O K
8640 min Winter	19.533	0.033	0.0	0.9	O K
10080 min Winter	19.529	0.029	0.0	0.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	59.849	0.0	33		
60 min Winter	39.413	0.0	62		
120 min Winter	23.812	0.0	120		
180 min Winter	17.737	0.0	178		
240 min Winter	14.290	0.0	236		
360 min Winter	10.505	0.0	348		
480 min Winter	8.461	0.0	454		
600 min Winter	7.118	0.0	544		
720 min Winter	6.190	0.0	576		
960 min Winter	4.959	0.0	722		
1440 min Winter	3.622	0.0	1024		
2160 min Winter	2.640	0.0	1448		
2880 min Winter	2.107	0.0	1820		
4320 min Winter	1.530	0.0	2504		
5760 min Winter	1.218	0.0	3168		
7200 min Winter	1.019	0.0	3696		
8640 min Winter	0.882	0.0	4584		
10080 min Winter	0.781	0.0	5344		
©1982-2019 Innovyze					

GTA Civils Ltd		Page 4
Gloucester House	47 The Ridings	
66a Church Walk	30% Vods Inf Blanket	
Burgess Hill, EN43 6LE	1 in 10 years	
Date 05/05/2020	Designed by LT	
File Drivewa Stone Soakaway	Checked by MR	
XP Solutions	Source Control 2019.1	
<u>Model Details</u>		
Storage is Online Cover Level (m) 20.000		
<u>Porous Car Park Structure</u>		
Infiltration Coefficient Base (m/hr)	0.00511	Width (m) 3.0
Membrane Percolation (mm/hr)	1000	Length (m) 29.4
Max Percolation (l/s)	24.5	Slope (1:X) 0.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.36	Evaporation (mm/day) 3
Invert Level (m)	19.500	Membrane Depth (m) 0
©1982-2019 Innovyze		

GTA Civils Ltd				Page 1																																																																																																																																																																																																																			
Gloucester House		47 The Ridings																																																																																																																																																																																																																					
66a Church Walk		Modular Soakaway																																																																																																																																																																																																																					
Burgess Hill, BN43 6LE		1 in 10 Years																																																																																																																																																																																																																					
Date 05/05/2020		Designed by LT																																																																																																																																																																																																																					
File Plot 47 1 in 10.srcz		Checked by MR																																																																																																																																																																																																																					
XP Solutions		Source Control 2019.1																																																																																																																																																																																																																					
<u>Summary of Results for 10 year Return Period</u> Half Drain Time : 1393 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>18.539</td><td>0.039</td><td>0.0</td><td>1.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>18.551</td><td>0.051</td><td>0.0</td><td>2.4</td><td>O K</td></tr><tr><td>60 min Summer</td><td>18.564</td><td>0.064</td><td>0.0</td><td>3.0</td><td>O K</td></tr><tr><td>120 min Summer</td><td>18.578</td><td>0.078</td><td>0.0</td><td>3.6</td><td>O K</td></tr><tr><td>180 min Summer</td><td>18.586</td><td>0.086</td><td>0.0</td><td>4.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>18.591</td><td>0.091</td><td>0.0</td><td>4.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>18.599</td><td>0.099</td><td>0.0</td><td>4.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>18.604</td><td>0.104</td><td>0.0</td><td>4.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>18.608</td><td>0.108</td><td>0.0</td><td>5.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>18.610</td><td>0.110</td><td>0.0</td><td>5.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>18.613</td><td>0.113</td><td>0.0</td><td>5.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>18.615</td><td>0.115</td><td>0.0</td><td>5.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>18.616</td><td>0.116</td><td>0.0</td><td>5.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>18.614</td><td>0.114</td><td>0.0</td><td>5.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>18.609</td><td>0.109</td><td>0.0</td><td>5.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>18.603</td><td>0.103</td><td>0.0</td><td>4.8</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>18.596</td><td>0.096</td><td>0.0</td><td>4.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>18.590</td><td>0.090</td><td>0.0</td><td>4.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>18.584</td><td>0.084</td><td>0.0</td><td>3.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>18.543</td><td>0.043</td><td>0.0</td><td>2.0</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>54.438</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>35.921</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>22.792</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>14.111</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>10.575</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>8.591</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>6.398</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>5.187</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>4.406</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>3.855</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>3.120</td><td>0.0</td><td>956</td></tr><tr><td>1440 min Summer</td><td>2.315</td><td>0.0</td><td>1184</td></tr><tr><td>2160 min Summer</td><td>1.716</td><td>0.0</td><td>1560</td></tr><tr><td>2880 min Summer</td><td>1.387</td><td>0.0</td><td>1964</td></tr><tr><td>4320 min Summer</td><td>1.027</td><td>0.0</td><td>2808</td></tr><tr><td>5760 min Summer</td><td>0.829</td><td>0.0</td><td>3632</td></tr><tr><td>7200 min Summer</td><td>0.702</td><td>0.0</td><td>4400</td></tr><tr><td>8640 min Summer</td><td>0.614</td><td>0.0</td><td>5192</td></tr><tr><td>10080 min Summer</td><td>0.547</td><td>0.0</td><td>5952</td></tr><tr><td>15 min Winter</td><td>54.438</td><td>0.0</td><td>19</td></tr></tbody></table> ©1982-2019 Innovyze						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status	15 min Summer	18.539	0.039	0.0	1.8	O K	30 min Summer	18.551	0.051	0.0	2.4	O K	60 min Summer	18.564	0.064	0.0	3.0	O K	120 min Summer	18.578	0.078	0.0	3.6	O K	180 min Summer	18.586	0.086	0.0	4.0	O K	240 min Summer	18.591	0.091	0.0	4.3	O K	360 min Summer	18.599	0.099	0.0	4.7	O K	480 min Summer	18.604	0.104	0.0	4.9	O K	600 min Summer	18.608	0.108	0.0	5.1	O K	720 min Summer	18.610	0.110	0.0	5.2	O K	960 min Summer	18.613	0.113	0.0	5.3	O K	1440 min Summer	18.615	0.115	0.0	5.4	O K	2160 min Summer	18.616	0.116	0.0	5.4	O K	2880 min Summer	18.614	0.114	0.0	5.4	O K	4320 min Summer	18.609	0.109	0.0	5.1	O K	5760 min Summer	18.603	0.103	0.0	4.8	O K	7200 min Summer	18.596	0.096	0.0	4.5	O K	8640 min Summer	18.590	0.090	0.0	4.2	O K	10080 min Summer	18.584	0.084	0.0	3.9	O K	15 min Winter	18.543	0.043	0.0	2.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)	15 min Summer	54.438	0.0	19	30 min Summer	35.921	0.0	34	60 min Summer	22.792	0.0	64	120 min Summer	14.111	0.0	124	180 min Summer	10.575	0.0	182	240 min Summer	8.591	0.0	242	360 min Summer	6.398	0.0	362	480 min Summer	5.187	0.0	482	600 min Summer	4.406	0.0	602	720 min Summer	3.855	0.0	720	960 min Summer	3.120	0.0	956	1440 min Summer	2.315	0.0	1184	2160 min Summer	1.716	0.0	1560	2880 min Summer	1.387	0.0	1964	4320 min Summer	1.027	0.0	2808	5760 min Summer	0.829	0.0	3632	7200 min Summer	0.702	0.0	4400	8640 min Summer	0.614	0.0	5192	10080 min Summer	0.547	0.0	5952	15 min Winter	54.438	0.0	19
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status																																																																																																																																																																																																																		
15 min Summer	18.539	0.039	0.0	1.8	O K																																																																																																																																																																																																																		
30 min Summer	18.551	0.051	0.0	2.4	O K																																																																																																																																																																																																																		
60 min Summer	18.564	0.064	0.0	3.0	O K																																																																																																																																																																																																																		
120 min Summer	18.578	0.078	0.0	3.6	O K																																																																																																																																																																																																																		
180 min Summer	18.586	0.086	0.0	4.0	O K																																																																																																																																																																																																																		
240 min Summer	18.591	0.091	0.0	4.3	O K																																																																																																																																																																																																																		
360 min Summer	18.599	0.099	0.0	4.7	O K																																																																																																																																																																																																																		
480 min Summer	18.604	0.104	0.0	4.9	O K																																																																																																																																																																																																																		
600 min Summer	18.608	0.108	0.0	5.1	O K																																																																																																																																																																																																																		
720 min Summer	18.610	0.110	0.0	5.2	O K																																																																																																																																																																																																																		
960 min Summer	18.613	0.113	0.0	5.3	O K																																																																																																																																																																																																																		
1440 min Summer	18.615	0.115	0.0	5.4	O K																																																																																																																																																																																																																		
2160 min Summer	18.616	0.116	0.0	5.4	O K																																																																																																																																																																																																																		
2880 min Summer	18.614	0.114	0.0	5.4	O K																																																																																																																																																																																																																		
4320 min Summer	18.609	0.109	0.0	5.1	O K																																																																																																																																																																																																																		
5760 min Summer	18.603	0.103	0.0	4.8	O K																																																																																																																																																																																																																		
7200 min Summer	18.596	0.096	0.0	4.5	O K																																																																																																																																																																																																																		
8640 min Summer	18.590	0.090	0.0	4.2	O K																																																																																																																																																																																																																		
10080 min Summer	18.584	0.084	0.0	3.9	O K																																																																																																																																																																																																																		
15 min Winter	18.543	0.043	0.0	2.0	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	54.438	0.0	19																																																																																																																																																																																																																				
30 min Summer	35.921	0.0	34																																																																																																																																																																																																																				
60 min Summer	22.792	0.0	64																																																																																																																																																																																																																				
120 min Summer	14.111	0.0	124																																																																																																																																																																																																																				
180 min Summer	10.575	0.0	182																																																																																																																																																																																																																				
240 min Summer	8.591	0.0	242																																																																																																																																																																																																																				
360 min Summer	6.398	0.0	362																																																																																																																																																																																																																				
480 min Summer	5.187	0.0	482																																																																																																																																																																																																																				
600 min Summer	4.406	0.0	602																																																																																																																																																																																																																				
720 min Summer	3.855	0.0	720																																																																																																																																																																																																																				
960 min Summer	3.120	0.0	956																																																																																																																																																																																																																				
1440 min Summer	2.315	0.0	1184																																																																																																																																																																																																																				
2160 min Summer	1.716	0.0	1560																																																																																																																																																																																																																				
2880 min Summer	1.387	0.0	1964																																																																																																																																																																																																																				
4320 min Summer	1.027	0.0	2808																																																																																																																																																																																																																				
5760 min Summer	0.829	0.0	3632																																																																																																																																																																																																																				
7200 min Summer	0.702	0.0	4400																																																																																																																																																																																																																				
8640 min Summer	0.614	0.0	5192																																																																																																																																																																																																																				
10080 min Summer	0.547	0.0	5952																																																																																																																																																																																																																				
15 min Winter	54.438	0.0	19																																																																																																																																																																																																																				

GTA Civils Ltd				Page 2	
Gloucester House		47 The Ridings			
66a Church Walk		Modular Soakaway			
Burgess Hill, BN43 6LE		1 in 10 Years			
Date 05/05/2020		Designed by LT			
File Plot 47 1 in 10.srcz		Checked by MR			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 10 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	18.557	0.057	0.0	2.7	O K
60 min Winter	18.572	0.072	0.0	3.4	O K
120 min Winter	18.587	0.087	0.0	4.1	O K
180 min Winter	18.597	0.097	0.0	4.5	O K
240 min Winter	18.603	0.103	0.0	4.8	O K
360 min Winter	18.612	0.112	0.0	5.3	O K
480 min Winter	18.618	0.118	0.0	5.6	O K
600 min Winter	18.622	0.122	0.0	5.8	O K
720 min Winter	18.626	0.126	0.0	5.9	O K
960 min Winter	18.629	0.129	0.0	6.1	O K
1440 min Winter	18.632	0.132	0.0	6.2	O K
2160 min Winter	18.631	0.131	0.0	6.2	O K
2880 min Winter	18.629	0.129	0.0	6.0	O K
4320 min Winter	18.620	0.120	0.0	5.6	O K
5760 min Winter	18.610	0.110	0.0	5.2	O K
7200 min Winter	18.599	0.099	0.0	4.7	O K
8640 min Winter	18.589	0.089	0.0	4.2	O K
10080 min Winter	18.579	0.079	0.0	3.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	35.921	0.0	33		
60 min Winter	22.792	0.0	62		
120 min Winter	14.111	0.0	122		
180 min Winter	10.575	0.0	180		
240 min Winter	8.591	0.0	240		
360 min Winter	6.398	0.0	356		
480 min Winter	5.187	0.0	472		
600 min Winter	4.406	0.0	588		
720 min Winter	3.855	0.0	700		
960 min Winter	3.120	0.0	924		
1440 min Winter	2.315	0.0	1354		
2160 min Winter	1.716	0.0	1688		
2880 min Winter	1.387	0.0	2136		
4320 min Winter	1.027	0.0	3068		
5760 min Winter	0.829	0.0	3920		
7200 min Winter	0.702	0.0	4752		
8640 min Winter	0.614	0.0	5536		
10080 min Winter	0.547	0.0	6256		
©1982-2019 Innovyze					

Gloucester House
66a Church Walk
Burgess Hill, EN43 6LE

47 The Ridings
Modular Soakaway
1 in 10 Years

Date 05/05/2020

Designed by LR

File Plot 47 1 in 10.srcx

Checked by MR

XP Solutions

Source Control 2019.1



Model Details

Storage is Online Cover Level (m) 19.480

Cellular Storage Structure

Invert Level (m)	18.590	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00511	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00511		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	49.5	49.5	0.500	0.0	61.1
0.400	49.5	61.1			

GTA Civils Ltd			Page 1		
Gloucester House		47 The Ridings			
66a Church Walk		Modular Soakaway			
Burgess Hill, BN43 6LE		100 Years + 40% CC			
Date 05/05/2020		Designed by LT			
File Plot 47 1 in 100 +		Checked by MR			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Half Drain Time : 3310 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	18.589	0.089	0.0	4.2	O K
30 min Summer	18.619	0.119	0.0	5.6	O K
60 min Summer	18.652	0.152	0.0	7.2	O K
120 min Summer	18.687	0.187	0.0	8.6	O K
180 min Summer	18.707	0.207	0.0	9.7	O K
240 min Summer	18.721	0.221	0.0	10.4	O K
360 min Summer	18.740	0.240	0.0	11.3	O K
480 min Summer	18.753	0.253	0.0	11.9	O K
600 min Summer	18.763	0.263	0.0	12.4	O K
720 min Summer	18.770	0.270	0.0	12.7	O K
960 min Summer	18.781	0.281	0.0	13.2	O K
1440 min Summer	18.792	0.292	0.0	13.7	O K
2160 min Summer	18.795	0.295	0.0	13.9	O K
2880 min Summer	18.792	0.292	0.0	13.7	O K
4320 min Summer	18.793	0.293	0.0	13.3	O K
5760 min Summer	18.773	0.273	0.0	12.8	O K
7200 min Summer	18.762	0.262	0.0	12.3	O K
8640 min Summer	18.751	0.251	0.0	11.8	O K
10080 min Summer	18.741	0.241	0.0	11.3	O K
15 min Winter	18.600	0.100	0.0	4.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	124.633	0.0	19		
30 min Summer	83.789	0.0	34		
60 min Summer	53.779	0.0	64		
120 min Summer	33.337	0.0	124		
180 min Summer	24.832	0.0	184		
240 min Summer	20.006	0.0	244		
360 min Summer	14.706	0.0	364		
480 min Summer	11.818	0.0	482		
600 min Summer	9.966	0.0	602		
720 min Summer	8.665	0.0	722		
960 min Summer	6.943	0.0	962		
1440 min Summer	5.071	0.0	1442		
2160 min Summer	3.696	0.0	2160		
2880 min Summer	2.949	0.0	2868		
4320 min Summer	2.142	0.0	3288		
5760 min Summer	1.705	0.0	4088		
7200 min Summer	1.427	0.0	4896		
8640 min Summer	1.235	0.0	5704		
10080 min Summer	1.093	0.0	6552		
15 min Winter	124.633	0.0	19		
©1982-2019 Innovyze					

GTA Civils Ltd				Page 2	
Gloucester House		47 The Ridings			
66a Church Walk		Modular Soakaway			
Burgess Hill, EN43 6LE		100 Years + 40% CC			
Date 05/05/2020		Designed by LT			
File Plot 47 1 in 100 +		Checked by MR			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	18.634	0.134	0.0	6.3	O K
60 min Winter	18.671	0.171	0.0	8.6	O K
120 min Winter	18.710	0.210	0.0	9.9	O K
180 min Winter	18.733	0.233	0.0	10.9	O K
240 min Winter	18.748	0.248	0.0	11.7	O K
360 min Winter	18.770	0.270	0.0	12.7	O K
480 min Winter	18.785	0.285	0.0	13.4	O K
600 min Winter	18.797	0.297	0.0	14.0	O K
720 min Winter	18.806	0.306	0.0	14.4	O K
960 min Winter	18.819	0.319	0.0	15.0	O K
1440 min Winter	18.833	0.333	0.0	15.7	O K
2160 min Winter	18.849	0.349	0.0	16.6	O K
2880 min Winter	18.859	0.359	0.0	15.9	O K
4320 min Winter	18.826	0.326	0.0	15.3	O K
5760 min Winter	18.813	0.313	0.0	14.7	O K
7200 min Winter	18.798	0.298	0.0	14.0	O K
8640 min Winter	18.782	0.282	0.0	13.3	O K
10080 min Winter	18.767	0.267	0.0	12.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.789	0.0	34		
60 min Winter	53.779	0.0	64		
120 min Winter	33.337	0.0	122		
180 min Winter	24.832	0.0	182		
240 min Winter	20.006	0.0	240		
360 min Winter	14.706	0.0	360		
480 min Winter	11.818	0.0	478		
600 min Winter	9.966	0.0	596		
720 min Winter	8.665	0.0	714		
960 min Winter	6.943	0.0	944		
1440 min Winter	5.071	0.0	1412		
2160 min Winter	3.696	0.0	2092		
2880 min Winter	2.949	0.0	2740		
4320 min Winter	2.142	0.0	3500		
5760 min Winter	1.705	0.0	4384		
7200 min Winter	1.427	0.0	5328		
8640 min Winter	1.235	0.0	6224		
10080 min Winter	1.093	0.0	7064		
©1982-2019 Innovyze					

GTA Civils Ltd		Page 4
Gloucester House	47 The Ridings	
66a Church Walk	Modular Soakaway	
Burgess Hill, EN43 6LE	100 Years + 40% CC	
Date 05/05/2020	Designed by LT	
File Plot 47 1 in 100 +	Checked by MR	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.480

Cellular Storage Structure

Invert Level (m) 18.500 Safety Factor 2.0

Infiltration Coefficient Base (m/hr) 0.00511 Porosity 0.95

Infiltration Coefficient Side (m/hr) 0.00511

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	49.5	49.5	0.500	0.0	61.1
0.400	49.5	61.1			

©1982-2019 Innovyze

Appendix F

Drainage Management and Maintenance Plan

Maintenance Responsibilities

Ongoing maintenance of the drainage system will be the responsibility of the owner. Regular inspections of the different elements of the surface water and foul drainage systems shall be made in line with industry standards. Details of maintenance of the different parts of the system are provided within this report under the headings which follow.

Contamination or Dilution of Spillage

The Environment Agency would prefer all spillages to be contained to prevent any downstream contamination. However, this cannot always be achieved, depending on the nature of the spillage. In all circumstances involving the spillage of substances it is important that the Environment Agency are notified as soon as possible so that they can provide advice and take appropriate action.

Prompt action following a spillage can prevent or reduce its effects, whilst inappropriate action may cause or worsen the pollution effects.

In the event of a spillage on site it is the responsibility of the owner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be to use sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

Gravel Drives

The surfaces should be kept clear of debris and cleaned as necessary.

Areas subject to snow, ice and frost can be treated using Rock Salt; however, this can damage surrounding metal/concrete surfaces and may be harmful to plants/turf. Excessive snow should be shovelled away using a plastic snow shovel, taking care not to remove the surface.

Catchpits and Gullies

Regular inspection and maintenance is required to ensure the effective long-term operation of catchpits and gullies.

Operation and maintenance requirements for all catchpits and gullies are listed in the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly intervals.
	Common car park & other hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems.	Weekly.
	Debris removal from gullies & silt pits, channel drains (where may cause risks to performance).	6 Monthly intervals, after autumn leaf fall, or as required based on specific observations.
	Lift and inspect receiving manholes from new dwellings within public areas to check for any blockages.	Monthly.
Remedial Actions	Repair any damaged gully gratings or silt pit covers.	As required.
	Replace / fix any loose channel drain covers.	As required.

Cellular Soakaway

The catchpit chambers at the inlet and outlet ends of the cellular tank should be checked periodically in conjunction with general maintenance of the underground pipe network. It is not possible to access the cellular soakaway directly.

Pipes, Chambers and Outfalls - Surface Water Drainage

Inspection frequency: annually.

Maintenance Requirements: Carry out visual check of all inspection chambers, manholes and the outfall to ensure all pipes are clear and free flowing. If not, clean out by rodding or jetting.

A CCTV Drainage Survey should be completed every 10 Years and any of blockage/waste build up should be jet washed or removed by a Licensed Effluent Disposal Contractor.

Pipes Chamber and Outfalls - Foul Drainage

Maintenance Requirements: Visual inspection of chambers & manholes should be completed on a 5-yearly basis and any signs of blockage / waste build up should be jet washed or removed by a Licensed Effluent Disposal Contractor.

A CCTV Drainage Survey should be completed every 10 Years and any of blockage/waste build up should be jet washed or removed by a Licensed Effluent Disposal Contractor.

