North Street, Alfriston

East Sussex

BN26 5SX

Flood Risk Assessment and Drainage Strategy

.

Prepared by:

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Tel: 01794 223146

Prepared for:

Domusea Developments

Ref: KNC2404/FRA

Prepared by Kazys Narbutas Signed K.M.N.Ltd
BSc (Hons) CEng
MICE MCIHT AAPS Date: 22nd May 2024

Revision	Description	Date	Initials
O	Initial issue	May 24	KN

CONTENTS

Appendices

1.0 INTRODUCTION

1.1 Appointment

1.1.1 Kazys Narbutas Consulting was commissioned by Domusea Developments to produce an initial flood risk and drainage assessment in support of the outline planning application for the proposed development of a block of five residential flats on the site of North Street, Alfriston, East Sussex, to be submitted to East Sussex County Council.

1.2 Objective of Assessment

1.2.1 The assessment is focused on the flood risk associated with the site and the potential constraints to any proposed redevelopment.

1.2.2 The assessment consists of a desk study, data research and a topographical survey of the site.

1.2.3 The assessment considers all potential sources of flooding, including fluvial, pluvial, tidal, surface water runoff, overland flows, groundwater, sewers and artificial ponds and reservoirs.

1.2.4 The assessment will also establish what the most appropriate surface water drainage techniques are to ensure the development complies with the requirements of the '*National Planning Policy Framework'* guidance and associated Technical Guidance.

1.2.5 The NPPF guidance and Technical Guidance are published by the Department for Communities and Local Government and sets out the Government's planning policies for England and how these are to be applied for meeting the challenge of climate change, flooding and coastal change.

1.3 Sources of Information and Limitations

1.3.1 In preparing this report, the following information and documents have been referenced:

- 'National Planning Policy Framework (NPPF) guidance and associated Technical Guidance;
- Environment Agency (EA) Flood Maps for Planning;

- East Sussex County Council Local Flood Risk Management Strategy 2016-2026;
- South Down National Park Authority Level 2 Strategic Flood Risk Assessment – SDNPFRA . (Identified as development site SD58)
- Southern Water Sewer Records and;
- Site investigation information undertaken by Ground & Water consulting.
- Site survey undertaken by J. Brotherton & Partners

1.3.2 Kazys Narbutas Consulting Ltd is not liable for any errors resulting from third party information.

2.0 EXISTING SITE

2.1 Site Location

2.1.1 The site is situated off North Street, Alfriston, East Sussex. The grid reference is 552114, 1032172. The site location can be seen on Figure 1 below.

Figure 1: Site Location

2.1.2 The site is administered by the South Downs National Park within the Wealden District area.

2.1.3 East Sussex County Council operate as the Lead Local Flood Authority and SuDS consultee

2.2 Site Description

2.2.1 The site is a former allotments site situated to the rear of existing properties fronting North Lane. The site covers an area of approximately 0.23 Hectares, consisting of allotment gardens and trees.

2.3 Site Topography

2.3.1 A topographical survey attached in **Appendix A** has been carried out for the site and indicates the land falls approximately four metres from the boundary at the south west corner to the boundary at the north east corner of the site.

2.4 Existing Watercourses

2.4.1 The River Cuckmere lies approximately 100 metres to the East of the development site, this lies outside the boundary of the topographical survey..

2.4.2 The Environment Agency (EA) has supplied copies of their flood defences for the site which encompasses the River Cuckmere.

.2.5 Existing Drainage

2.5.1 The local sewerage undertaker for the area is Southern Water and their records, attached in **Appendix B**, indicate that there are no public surface water sewers within the vicinity of the site.

2.5.2 The records also indicate public foul sewers running along North Street to the West of the site and the Willows to the East.

2.6 Ground Conditions

2.6.1 A preliminary site investigation has been undertaken revealing the underlying ground to consist of ‘zig zag’ chalk and coarse gravel. Winter ground water monitoring data has been obtained (dry for all visits) and preliminary infiltration tests, to BRE365 have been undertaken, copies of the trial pit logs, infiltration test data and a summary of the site investigation results can be found in **Appendix C.** .

3.0 SEQUENTIAL AND EXCEPTION TEST

3.1 Sequential Test

3.1.1 As set out in the NPPF documentation, inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:

- 'areas at risk of flooding' means land within Flood Zones 2 and 3; or land within flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency;

- 'flood risk' means risk from all sources of flooding – including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

3.1.2 As set out in the NPPF, the aim of the Sequential Test is to steer development to areas with the lowest probability of flooding. Flood Zones are the starting point for the Sequential Test. Flood maps can be accessed via the Environment Agency (EA) website which indicates Flood Zones 2 and 3 with Flood Zone 1 being all the land falling outside Zones 2 and 3.

3.1.3 The Flood Zones refer to the probability of sea and river flooding, ignoring the presence of existing defences, and are defined as follows;

- Flood Zone 1 Low Probability

  This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding.

- Flood Zone 2 Medium Probability

  This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding or between 1 in 200 and 1 in 1000 annual probability of sea flooding.

- Flood Zone 3 High Probability

  This zone comprises land assessed as having a 1 in 100 or greater probability of river flooding or 1 in 200 or greater probability of flooding from the sea.

3.2 Flood Zone

3.2.1 The SDNPFRA identified the site SD58 covering an area of 0.42Ha., however the proposed development covers a smaller area 0.23Ha and lies outside the identified flood zones FZ2 and FZ3 covered in the SDNPFRA. Flood Risk Assessment Data has been obtained from the EA and the area covered for this information is shown on the plan in **Appendix D.** The scale of the Flood Map for Planning, **Appendix E** implies that a very small corner of the site in the north east encroaches onto the Flood Zone 2. A topographical survey has been undertaken on the site seen in **Appendix A.** Highlighted on the survey is the 6.0mAOD contour which would define the limit of the flood zone FZ2. All new habitable dwellings have been located on higher ground, in FZ1.

3.3 Climate Change

3.3.1 Climate change has an impact on the peak rainfall intensity for an area and affects surface water flood risk and has to be taken into account in any drainage design.

3.3.2 The EA have published mapping which can be accessed on the following link https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3004 upon which the peak rainfall intensity allowances by catchment area are indicated. This is documented in **Appendix F.**

3.3.3 Having interrogated the mapping it has been determined that the site is situated in the Cuckmere and Pevensey Management Catchment.

3.3.4 The 'Climate Change Allowances' data has been interrogated and indicates that a 45% allowance for the 1% AEP rainfall event should be used in any drainage design.

3.4 Proposed Development

3.4.1 It is proposed to develop the site for residential use with five houses and associated roads and hardstanding being constructed.

.3.5 Flood Risk Vulnerability and Flood Zone Compatibility

3.5.1 The NPPF assess the suitability of a proposed development based on the flood risk vulnerability of the development against the flood zone for the development.

3.5.2 The construction of residential dwellings is classified as having a flood risk vulnerability of more vulnerable.

3.5.3 Table 2 below has been reproduced from the NPPF documentation and based on the table the development is permitted given the site is situated in Flood Zone 1.

Flood risk vulnerability classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	×	×	Exception Test Required	✓
Zone 3b functional floodplain	Exception Test Required	✓	×	×	×

Table 1: Flood risk vulnerability and flood zone 'compatibility'

3.5.4 From the information contained in the SDNPFRA and detailed above, the development site satisfies the requirements of the Sequential Test.

3.6 Flood Risk Assessment

3.6.1 The NPPF guidance indicates that for a proposed development site in excess of 1 hectare a Flood Risk Assessment (FRA) is required.

3.6.2 The development site is significantly less than one hectare, however South Downs National Park Authority advises that due to the constraints on site an FRA is required to be submitted with the planning application.

4.0 FLOOD RISK ASSESSMENT

4.1 Flood Risk Methodology

4.1.1 This FRA has been prepared in accordance with NPPF Technical Guidance *Technical Guidance to National Planning Policy Framework'* and demonstrates.

- whether the proposed development is likely to be affected by current or future flooding from any source;
- to the LPA (Local Planning Authority) that the development is safe and, where possible, reduces flood risk overall by considering the following:
    - The surface water run-off generated for the 1 in 100 year event with an allowance for climate change should be considered;
    - The effect of flooding from the development due to exceedance events and/or local drainage network failures.

4.2 Assessment of Flooding to Development

4.2.1 Rivers

4.2.1.1 The Sequential Test carried out in Section 3.0 of this report identified the development site as being situated in Flood Zone 1, having the lowest probability of flooding from river or sea sources and taking into account climate change. Evidence of this can be seen in **Appendix E.** Information regarding the flood defences of the River Cuckmere, the modelled flood outlines and the modelled flood levels can be found in **Appendix G**

4.2.2 Surface Water

4.2.2.1 The EA mapping, attached in **Appendix H**, indicates the development site has a very low risk of flooding from surface water.

4.2.3 Reservoirs

4.2.3.1 The EA mapping, attached to this report in **Appendix I**, indicates that the development site is not at risk of flooding from reservoirs being outside the Reservoir Flood Risk Map.

4.2.4 Access and Egress

4.2.4.1 The habitable dwellings of the proposed development have been shown to be entirely in FZ1 however, in the event of a catastrophic flood event east of the site, preventing pedestrian movements to the east, full access and egress can be achieved through the main site access to the west onto North Street.

4.3 Proposed Surface Water Drainage

4.3.1 Infiltration Drainage

4.3.1.1 Preliminary infiltration testing has been undertaken which has yielded positive results. In line with the SuDS hierarchy, which advocates surface water discharge to ground where appropriate, it is proposed to use gravel filled soakaways for the domestic rainwater discharge and the site access road and parking areas will be constructed with permeable block paving.

4.3.1.2 A complete analysis of the proposed surface water drainage network has been undertaken utilising FEH22 rainfall data and incorporating a 45% allowance for climate change, as detailed in paragraph 3.3 of this report and an additional 10% added for 'urban creep' A full set of MicroDrainage calculations together with accompanying information can be found in **Appendix J.**

4.3.2 Proposed Surface Water Drainage

4.3.2.1 A drawing showing the proposed surface water drainage strategy for the development can be found in **Appendix K.**

4.3.3 Urban Creep

4.3.3.1 An allowance of an additional 10% for roof areas has been included to the proposed impermeable areas for the drainage design to cater for future extensions to properties, these values can be seen on the drawing showing the drained areas in **Appendix J**.

4.3.4 Proposed Foul Drainage

4.3.4.1 The public drainage authority for the area is Southern Water, they have shown on their asset plans the presence of foul water sewers in North Street and The Willows. This information can be seen on the plan contained in **Appendix B**.

4.3.4.2 Given the topography of the site it is not possible to install a gravity foul sewer that will drain the site to the sewer in North Street. It is therefore proposed to install a new sewer, serving the development, that will connect to a new manhole constructed on the public sewer sited in The Willows. Details of the routing of the new foul sewer can be seen on the drainage strategy drawing found in **Appendix K**.

5.0 RESIDUAL RISK AND MITIGATION

5.1 Residual Risk

5.1.1 The following residual risks have been identified as part of the drainage and layout design;

- Exceedance events over and above the predicted rainfall intensity;
- Blockage of proposed drainage on site serving the development

5.2 Mitigation

5.2.1 To mitigate for the above residual risks the following is proposed;

- Site levels are designed so that any exceedance flows and overland flows are directed through the site to avoid flooding into properties;
- No highways or drainage serving the development will not be offered for adoption, so a management company will be set up and provided with a maintenance manual for maintaining the SuDS drainage proposals.
- Site levels are raised to reduce the risk of any potential groundwater breaking through the ground

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.1.1 Based on the current information the following can be concluded;

- The site is situated in Flood Zone 1 and is suitable for the proposed building type uses;
- Groundwater monitoring has shown that the anticipated high groundwater level alluded to in the SDNPFRA was not present. Infiltration test results have shown that the use of soakaways as the means of surface water disposal are suitable and have been shown to work for the proposed site layout..

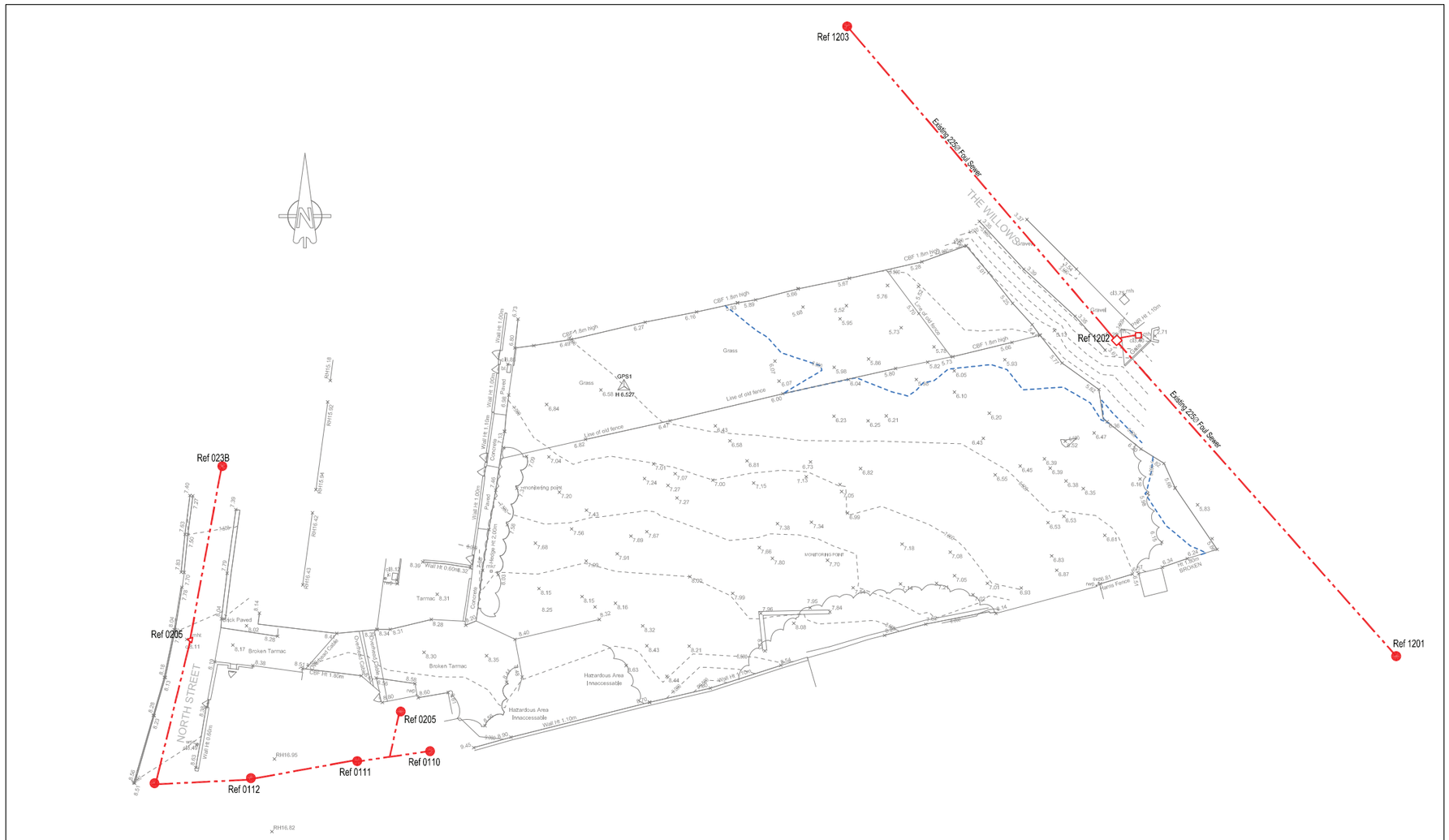
6.2 Recommendations

6.2.1 It is recommended that the following be undertaken;

- Carry out further intrusive Geotechnical Investigation to report on ground conditions present on site;

Appendix A

Topgraphical Survey



J. Brotherton & Partners

Land Surveyors & Engineers

"Firdown" 113 Frogmore Lane
Waterlooville, Hampshire PO8 9RD

Tel: 023 9259 1979
Email: enquiries@jbpsurveys.co.uk
Web: www.jbpsurveys.co.uk

Client	Ed Rees
Drawing Title	Topographic Land Survey
Location	North St, Alfriston, Polegate BN26 5UG

Revisions / Status / Notes

The grid and datum for this survey is based on the Ordinance Survey grid OSGB36, site centered on control station GPS1 with a scale factor of 1.00

LEVELS BASED ON	OSGB36	Surveyor:- SB	Assistant:- TC
GRID BASED ON	OSGB36	Drawn By:- SB	Checked by:- JB

Drawing & CAD Ref.: 24306

REVISIONS

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Project: NORTH STREET, ALFRISTON

Drawing Title: Engineering Details
Topographical Survey

Drawing Status: For Information

Client: DOMUSEA DEVELOPMENTS

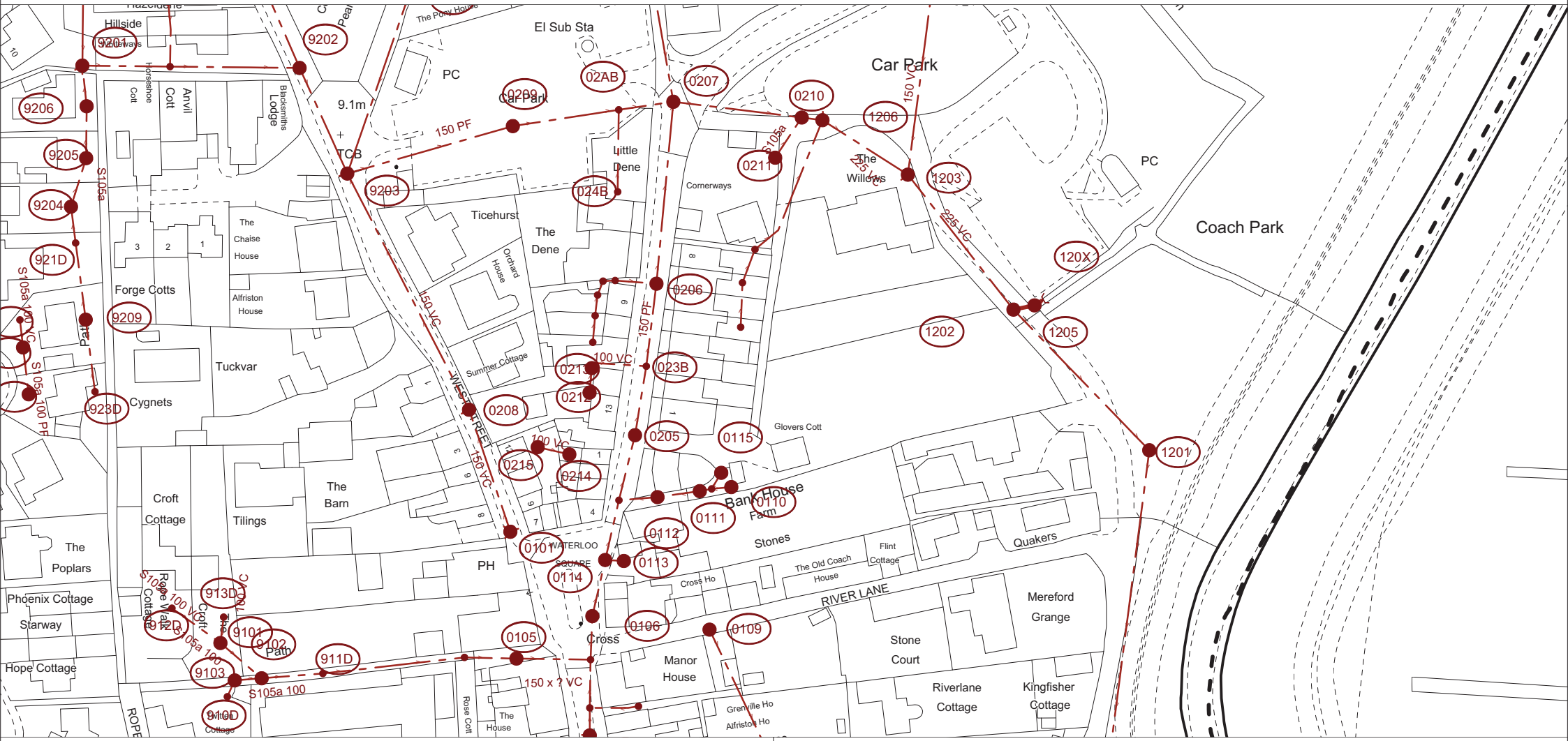
Rev.	Date	Details	Initials
A	20.05.24	First Issue	KN

Scales: 1:500	Paper Size: A3
Job No.: KNC2004	
Drawing No.: 500-01	Rev: A

Appendix B

Southern Water Sewer Records

SOUTHERN WATER



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.

Southern Water

O.S. REF: TQ5203SW

Scale: 1:1250

N

Printed By: SS

Date: 24-9-2021

Sewer Plot

Glovers Cottage North Street

21/23

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

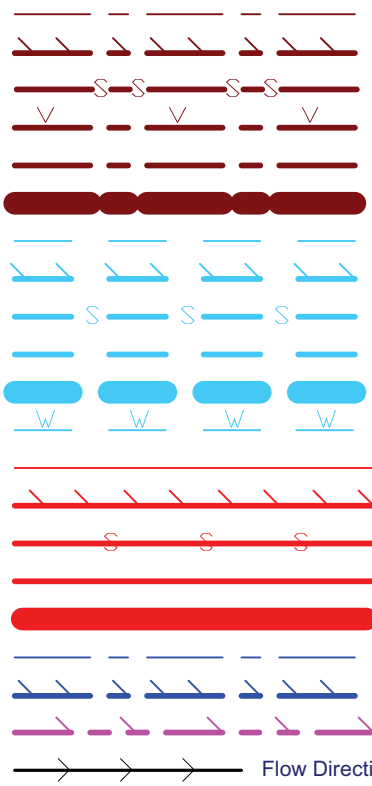
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

Requested By:

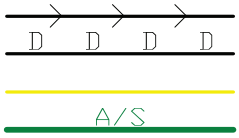
Land Searches
Map Legend

Sewer

Pipe Line Styles/Colours



Foul Sewer
Foul Rising Main
Foul Syphon Sewer
Foul Vacuum Sewer
Foul Trunk Sewer
Foul Tank Sewer
Surface Water Sewer
Surface Water Rising Main
Surface Water Syphon Sewer
Surface Water Trunk Sewer
Surface Water Tank Sewer
Culverted Watercourse
Combined Sewer
Combined Rising Main
Combined Syphon Sewer
Combined Trunk Sewer
Combined Tank Sewer
Treated Effluent
Treated Effluent Rising Main
Sludge Rising Main



Flow Direction Arrows (All Styles)
As above line styles but decommissioned
(Yellow) As above line styles but private
Access Shaft – Personnel Only

Boundary Line Styles/Colours

Catchment Boundary
Sub-Catchment Boundary
Section 104 Agreement Area
Building Over Agreement Area

Materials

AK	Alkathene	GRP	Glass Reinforced Plastic
BAC	Bonded Asbestos Cement *	MAC	Masonry in regular courses
BRE	Brick (Engineering)	MAR	Masonry in random courses
BRC	Brick (Common)	PE	Polyethyelene
CC	Concrete Box Culvert	PF	Pitch Fibre
CI	Cast Iron	PP	Polypropylene
CO	Concrete (In-Situ)	PVC	Polyvinyl Chloride
CP	Concrete (Pre-Cast)	RPM	Reinforced Plastic Matrix
CSB	Concrete Segments (Bolted)	SI	Spun Iron
CSU	Concrete Segments (Un-Bolted)	ST	Steel
DI	Ductile Iron	VC	Vitrified Clay
GRC	Glass Reinforced Concrete	UNK	Unknown*

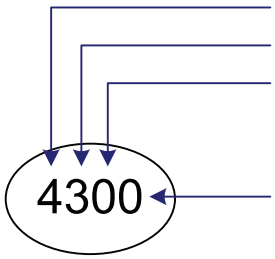
*Warning
BAC Pipes are constructed of Bonded Asbestos Cement
UNK Pipes are may be constructed of Bonded Asbestos Cement

Symbols

Surface	Foul	Combined	
4350	4300	4300	Label Ellipse
			Manhole
			Dummy/S.24 Manhole
			Manhole Backdrop
CP	n/a	n/a	Catchpit
S	n/a	n/a	Soakaway
BP	n/a	n/a	Balancing Pond
RE	RE	RE	Rodding Eye
WO	WO	WO	Washout
HB	HB	HB	Flushing Chamber Mn-E
FC	FC	FC	Flushing Chamber No-E
FC	FC	FC	Hatch Box
LH	LH	LH	Lamphole
IC	IC	IC	Interceptor Chamber
BS	BS	BS	Blind Shaft
ST	ST	ST	Storm Tank
VC	VC	VC	Vortex Chamber
VT	VT	VT	Vent
VE	VE	VE	Vent Column
?	?	?	Other/Unknown
PK	PK	PK	Penstock
CC	n/a	CC	Cascade
			Change Node
PS	PS	PS	Pumping Station
n/a	PS	PS	Micro Pumping Station
AV	AV	AV	Air Valve
			Valve
n/a			Reflux Valve
n/a	AFD	AFD	Anti-Flood Device
B	B	B	Blank End
			Head of Public Sewer
	n/a	n/a	Inlet
			Outfall
n/a	CSO	CSO	Storm Overflow
n/a	WWTW	WWTW	Treatment Works

Other symbols or text may be visible which are not shown here.
These are used for Southern Water operational guidance only.

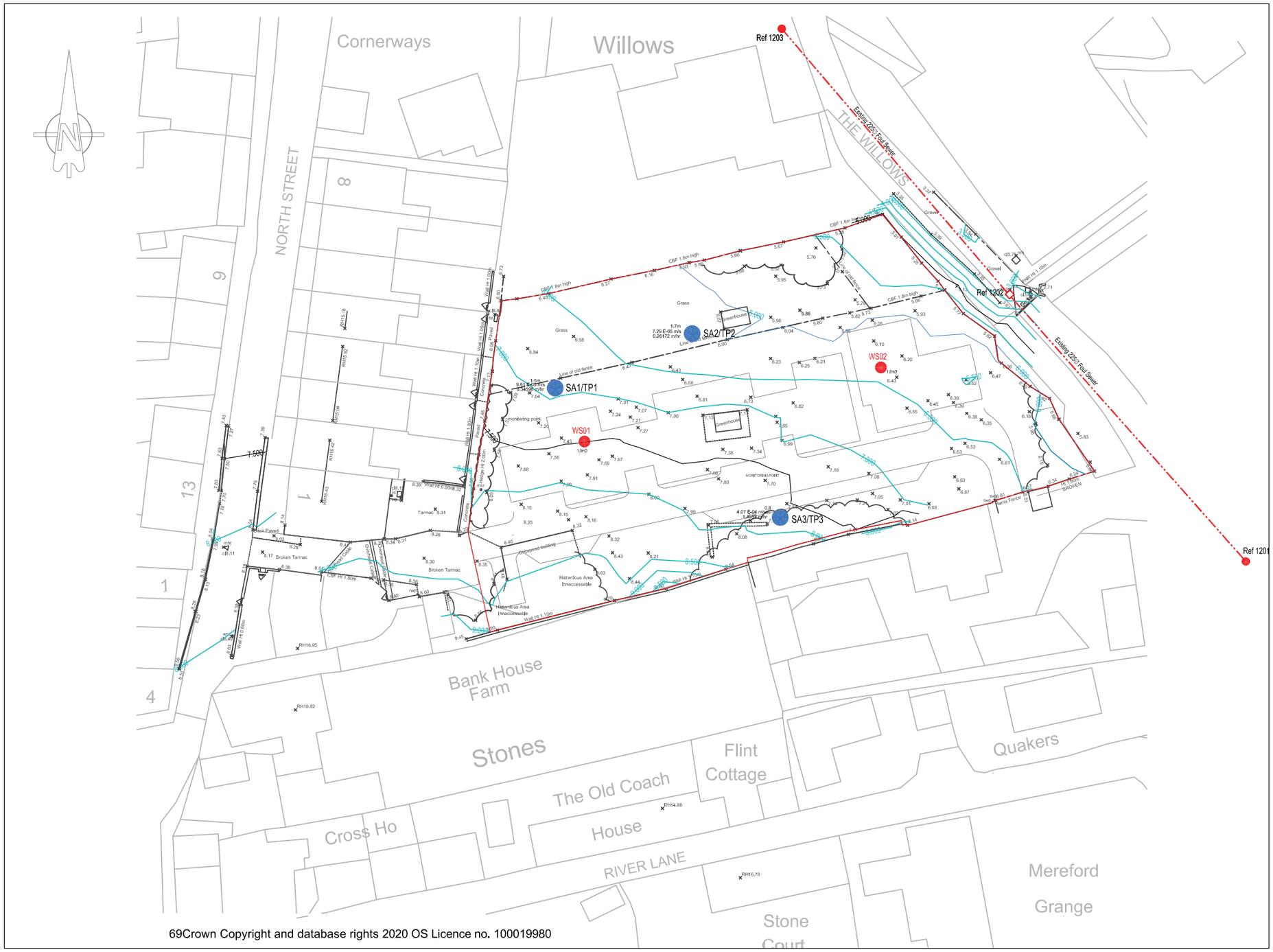
Node Referencing System



Hundred metre easting identifier
Hundred metre northing identifier
Sewer type Identifier:
0-4 = Foul/Combined
5-9 = Surface Water
Next sequential node/node identifier

Appendix C

Site Investigation Data



0m 10m 20m 30m 40m 50m
1:500m

KEY

WS01 — Groundwater Monitoring Locations
1.5mD: Borehole depth from ground level

Infiltration Testing
SA1/TP1
0.55m
9.496E-06m/s
0.034185m/hr
Infiltration Tests March 2024 in accordance with BRE365
-Depth and results shown

Groundwater Monitoring Results

Monitoring Well	24.01.24 m bgl	16.02.24 m bgl	24.01.24 m bgl	29.02.24 m bgl
WS01	Dry	Dry	Dry	Dry
WS02	Dry	Dry	Dry	Dry

Infiltration Test Results

Test Ref	Depth (m)	Test 1 (m/sec)	Test 2 (m/sec)	Test 3 (m/sec)	Lowest Value (m/hr)
SA1/TP1	1.5	9.61 E-05	9.61 E-05	9.62 E-05	0.34596
SA2/TP2	1.7	7.47 E-05	7.47 E-05	7.29 E-05	0.26172
SA3/TP3	0.8	4.69 E-04	4.07 E-04	4.07 E-04	1.4652

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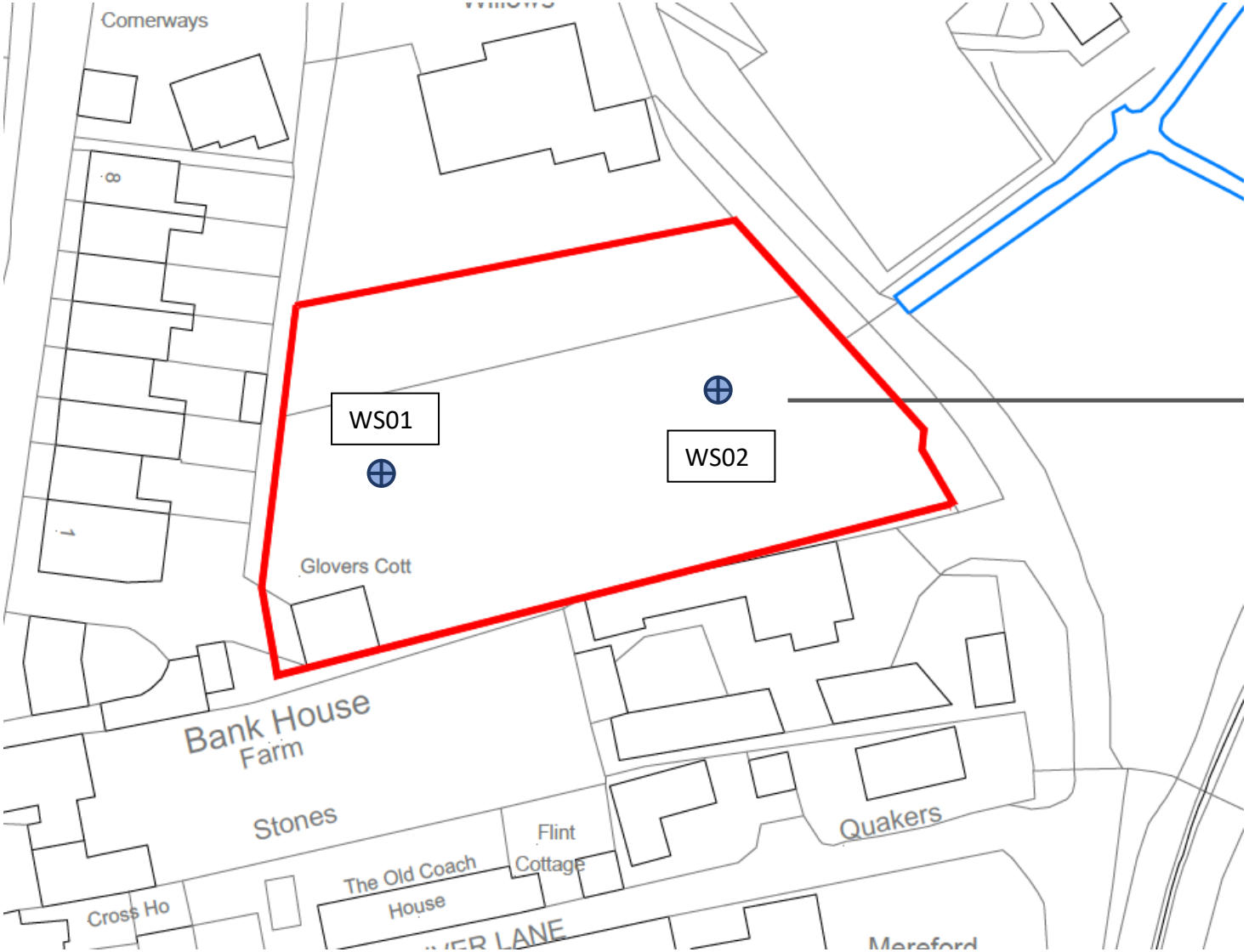
Project: NORTH STREET, ALFRISTON
Drawing Title: Engineering Details
Site Investigation Information
Drawing Status: For Information
Client: DOMUSEA DEVELOPMENTS

Rev.	Date	Details	Initials
C	20.05.24	Development outline and site boundary added	KN
B	06.03.24	Locatuions revised and test results added	KN
A	09.02.24	First Issue	KN

Scales: 1:500
Paper Size: A3
Job No.: KNC2004
Drawing No.: 500-00
Rev: C



Site boundary

Windowless Sampler Borehole

NTS

Land north of Bank House Farm 1 North St Alfriston, Polegate BN26 5UG	
Domusea Developments Limited	**January 2024**
Figure 1 – Trial Hole Location Plan	**GWPR5819**

ground&water

Trial Pit Log

Project Name: Land north of Bank House Farm, 1 North Street	Client: Domusea (Alfriston) Limited	Date:
Location: Alfriston Polegate BN26 5UG	Contractor: G&W	
Project No. : GWPR5866	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP1	TP			1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D					Structureless CHALK composed of off-white sandy gravelly SILT. Gravel is fine to coarse sub-angular to sub-rounded chalk. Clasts were moderately weak medium. (ZIG ZAG CHALK FORMATION, Grade Dm).
		0.50	D					
		0.80	D					
		1.00	D					
		1.50	D		1.50			End of Borehole at 1.500m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

No Groundwater.
Roots to 1.50m bgl.

Trial Pit Log

Project Name: Land north of Bank House Farm, 1 North Street	Client: Domusea (Alfriston) Limited	Date:
Location: Alfriston Polegate BN26 5UG	Contractor: G&W	
Project No. : GWPR5866	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP2	TP			1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.20			TOPSOIL: Dark brown, grey gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint and chalk.
		0.50	D		0.50			Brown, grey gravelly CLAY. Gravel is fine to medium sub-angular chalk and flint. (HEAD DEPOSITS).
		0.80	D		0.80			Structureless CHALK composed of off-white sandy gravelly SILT. Gravel is fine to coarse sub-angular to sub-rounded chalk. Clasts were moderately weak medium. (ZIG ZAG CHALK FORMATION, Grade Dm).
		1.00	D					Structureless CHALK composed of off-white, orange, grey sandy silty sub-angular to sub-rounded fine to coarse GRAVEL of chalk and rare flint. Clasts were moderately weak. (ZIG ZAG CHALK FORMATION, Grade Dc).
		1.50	D					
					1.70			End of Borehole at 1.700m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

No Groundwater.
Roots to 1.00m bgl.

Trial Pit Log

Project Name: Land north of Bank House Farm, 1 North Street	Client: Domusea (Alfriston) Limited	Date:
Location: Alfriston Polegate BN26 5UG	Contractor: G&W	
Project No. : GWPR5866	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP3	TP			1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.20			TOPSOIL: Dark brown, grey gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint and chalk.
		0.50	D					Dark brown, grey gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (HEAD DEPOSITS).
		0.80	D		0.80			End of Borehole at 0.800m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

No Groundwater.

Roots to 0.80m bgl.

Soakaway tests were undertaken with TP1, TP2 and TP3. A trial Hole location plan has also been attached. The results of the soakaway testing are shown below.

Soakage Testing Results						
Trial Hole	**Test Number**	**Depth (m bgl)**	**Start Depth (m bgl)**	**Finish Depth (m bgl)**	**Time Taken (mins)**	**Infiltration Rate (m/sec)**
TP1	1	1.50	0.70	1.50	40	9.61 x 10^-5
	2	1.50	0.70	1.50	40	9.61 x 10^-5
	3	1.50	0.70	1.50	40	9.62 x 10^-5
TP2	1	1.70	0.80	1.70	40	7.47 x 10^-5
	2	1.70	0.80	1.70	40	7.47 x 10^-5
	3	1.70	0.80	1.70	40	7.29 x 10^-5
TP3	1	0.80	0.40	0.80	6	4.69 x 10^-4
	2	0.80	0.40	0.80	6	4.07 x 10^-4
	3	0.80	0.40	0.80	7	4.07 x 10^-4

If you have any questions please let me know.

Can you please confirm that you have received this email and information.

Kind regards

Alex Stratford

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Engineer
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2 The Long Barn, Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

geotechnical and environmental consultants

Appendix D

Environment Agency Flood Risk assessment Date

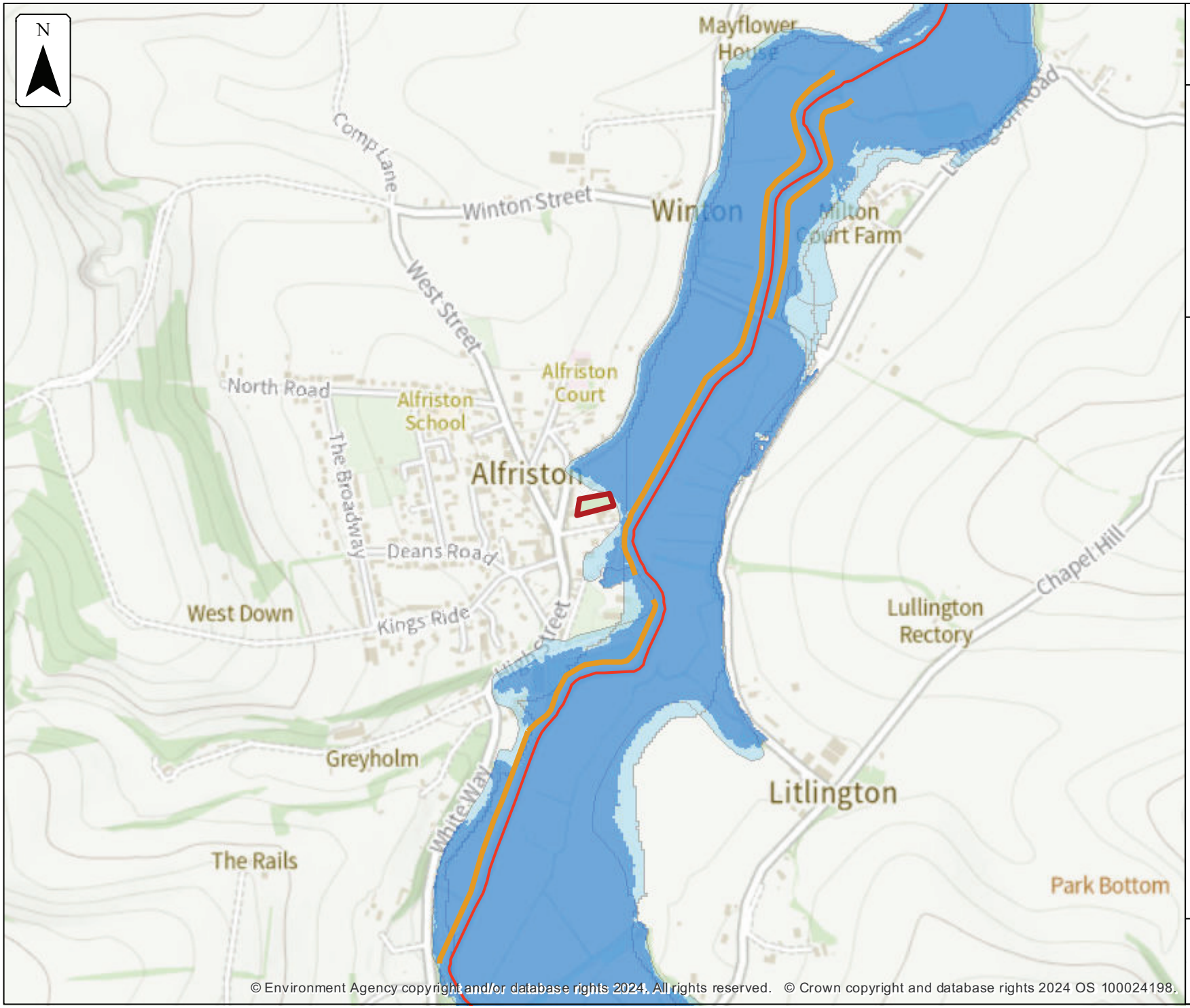
Flood risk assessment data

Location of site: 552114 / 103217 (shown as easting and northing coordinates)
Document created on: 24 April 2024
This information was previously known as a product 4.
Customer reference number: SSD

Map showing the location that flood risk assessment data has been requested for.

Appendix E

Environment Agency Flood Map for Planning & Historical Flood Map



Environment Agency

Flood map for planning

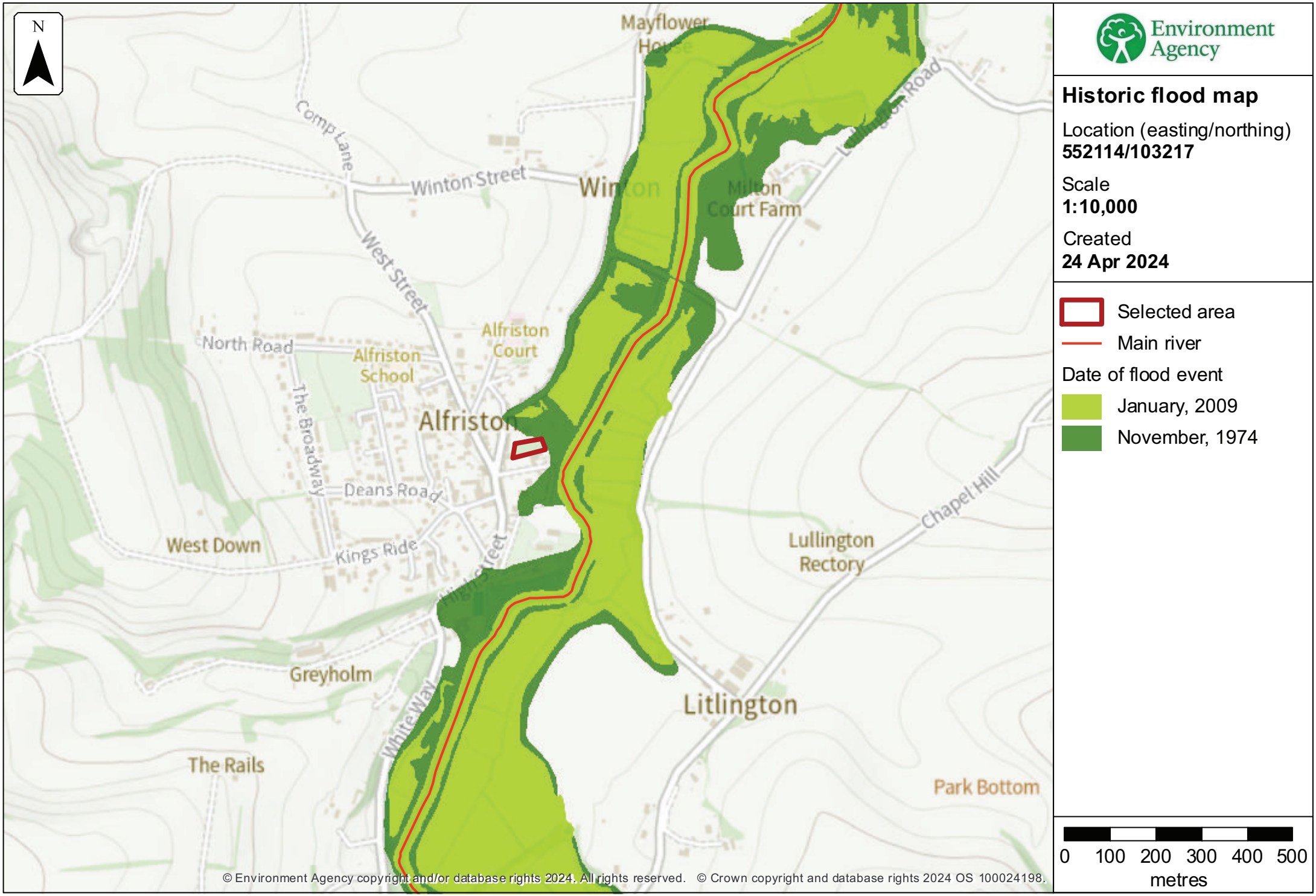
Location (easting/northing)
552114/103217

Scale
1:10,000

Created
24 Apr 2024

- Selected area
- Main river
- Flood defence
- Flood zone 3
- Flood zone 2

0 100 200 300 400 500
metres



Environment Agency

Historic flood map

Location (easting/northing)
552114/103217

Scale
1:10,000

Created
24 Apr 2024

Selected area

Main river

Date of flood event

January, 2009

November, 1974

0 100 200 300 400 500
metres

Appendix F

Environment Agency Climate Change Allowance

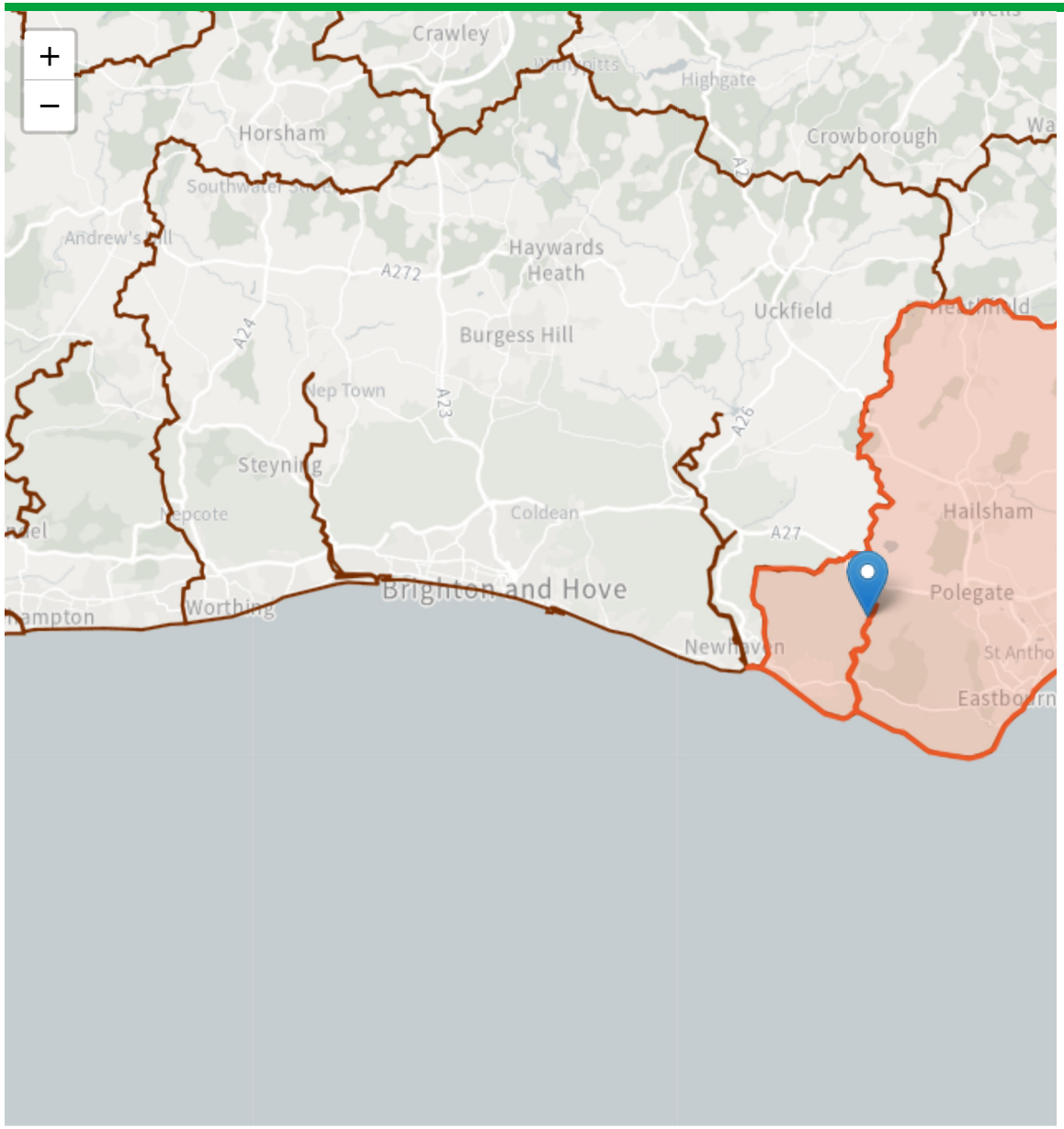
We would welcome your feedback to help us make future improvements.

Department for Environment Food & Rural Affairs

Data Services Platform

Climate Change Allowances

Hydrology Data Explorer



Cuckmere and Pevensey Levels Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch

	Central allowance	Upper end allowance
2050s	20%	40%
2070s	20%	40%

1% annual exceedance rainfall event

Epoch

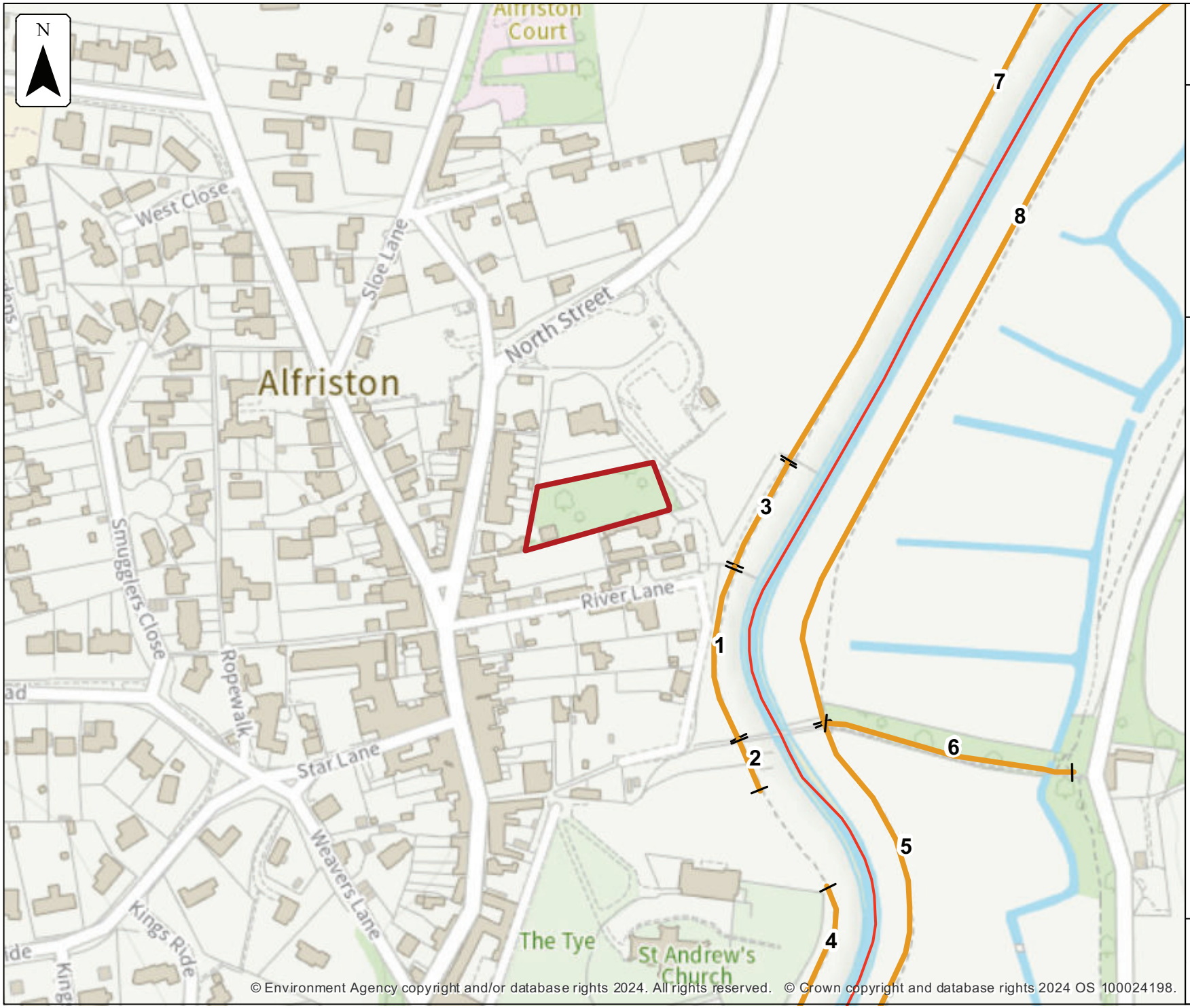
	Central allowance	Upper end allowance
2050s	20%	45%
2070s	25%	45%

*Use '2050s' for development with a lifetime up 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

This map contains information generated by Met Office Hadley Centre (2019): UKCP Local Projections on a 5km grid over the UK for 1980-2080. Centre for Environmental Data Analysis, 2022

Appendix G

River Defence and River Flooding



Environment Agency

Flood defences

Location (easting/northing)
552114/103217

Scale
1:2,500

Created
24 Apr 2024

Selected area
Main river
Flood defence

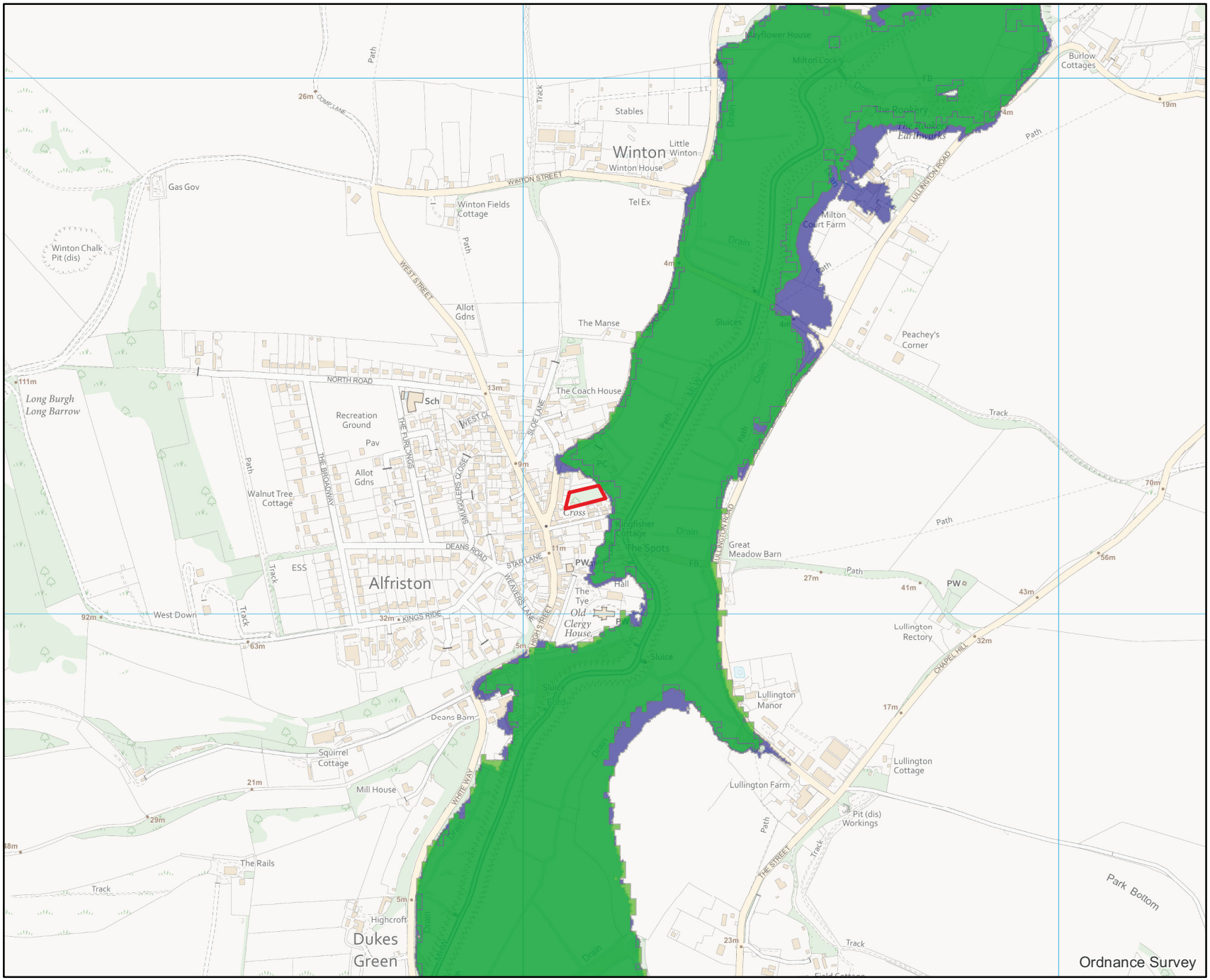
0 25 50 75 100
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	113842	Embankment	75	Fair	5.07	4.88	
2	116260	Embankment	75	Fair	4.72	5.09	
3	113341	Embankment	30	Fair	4.91	4.68	
4	116258	Embankment	75	Poor	4.88	4.85	
5	77728	Embankment	2	Poor	4.07	5.01	
6	98182	Embankment	2	Fair	4.35	3.89	
7	113342	Embankment	30	Fair	4.51	4.86	
8	78777	Embankment	10	Fair	4.29	4.68	

Any blank cells show where a particular value has not been recorded for an asset.

Modelled Flood Outines Fluvial (Undefended). Centred on 552120,103217. Created on 24/04/2024.



Environment Agency

N

Legend

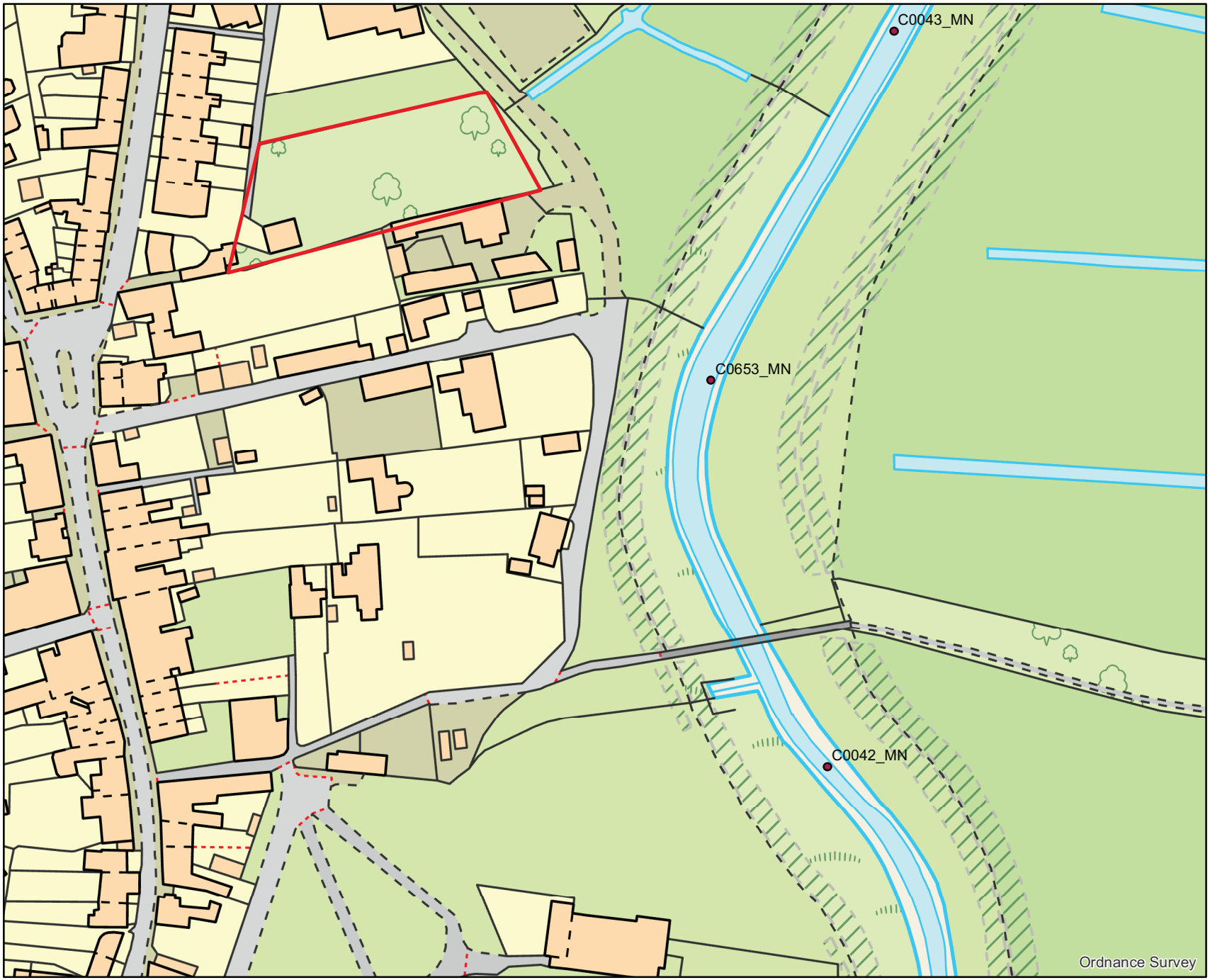
- Site Boundary
- 1% AEP (Undefended Fluvial)
- 0.1% AEP (Undefended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

0 0.225 0.45
Kilometers

FRA Site Boundary & Node Points. Centred 552120,103217. Created 25/04/2024.



Environment Agency

N

Legend

- FZI 2011 (1D Levels)
- Site Boundary

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:1,289

0 0.0275 0.055
Kilometers

creating a better place
for people and wildlife

Environment Agency

Product 4 Flood Risk Data Requested by: Kazys Narbutas Consulting

Site: Former Allotment Site, North Street, Alfriston

Table 1: Water Levels: Fluvial Undefended

	NGR		Modelled Flood Levels in Metres AOD	
			Undefended Annual Exceedance Probability	
Node Ref	**Eastings**	**Northings**	**1%**	**0.1%**
C0043_MN	552240	103253	4.23	4.8
C0653_MN	552196	103169	4.19	4.72
C0042_MN	552224	103076	4.39	4.84

All levels taken from Jflow + (SWE) Kent and East Sussex Fluvial Flood Zone Improvements, completed in 2011 by JBA Consulting.

Please note that this model is an improvement from our old Jflow model and only provides level data at specific points on the channel. We are unable to provide depths. However, these levels should provide a good understanding of the flood risk of the area.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Produced on: 25/04/2024

JFLOW Outputs Caveat

- Our work to produce Flood Zones followed a 10 year programme which delivered more detailed mapping for 821 locations. However, in order to complete Flood Zones we needed national coverage, hence a generalised approach was used to provide this national coverage within the time available, to fill the gaps between the 821 locations where we had more detailed information. The Flood Zones are therefore not as accurate as we would normally specify for river modelling, but they do provide an adequate indication of the extent of flood risk such that developers can consider flooding as part of their proposals to ensure they are not unknowingly putting additional lives at risk. This is the purpose for which the Flood Zones were produced.

- Neither water depths nor water levels were outputs that were specified when we commissioned this generalised modelling for Flood Zones. Whilst the modelling process does provide some information on depth of water, it would have been possible to produce the flood extents without storing the water depth values, since water depth is only a 'by-product' of the calculation process. As the JFLOW modelling method was developed, tested and reviewed for production of the Flood Zone extents only, we currently have no information on the accuracy of the water depth data.

- The models were run using a Digital Terrain Model (DTM) with a 5m x 5m grid. However the DTM grids were generalised to between 5m and 100m (depending on the type of model and location, for reasons such as processing speed). Fluvial modelling produced depth data which can be processed

Appendix H

Extent of Flooding from Surface Water


Exit map
Hide advanced options
Winton
Allotments
Alfriston Court
North Road
Alfriston School
Playing Field
Allotments
SITE
West Down
St Andrew's Church
Litlingto
Key
Extent of Flooding from Surface Water
Contains OS data (https://check-long-term-flood-risk.service.gov.uk/os-terms) © Crown copyright and database rights 2024

Appendix I

Reservoir Flooding

Extent of Flooding from Reservoirs

Appendix J

MicroDrainage Calculations and Drainage Areas

KEY

	Domestic roof areas contributing to infiltration drainage domestic soakaways
64sqm	Net area of roof discharging to soakaway
70sqm	Gross area of roof discharging to soakaway, Incorporating 10% 'urban creep'
So5	Receiving soakaway

0m 10m 20m 30m

Scale 1:250m

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Civil Engineering Consultant
Unit 24b, Romsey Industrial Estate, Greatbridge Road, Romsey, Hants. SO51 0HE
Telephone: 01794 223146 Email: kazys.n@knc.email

Project
NORTH STREET, ALFRISTON

Drawing Title
Engineering Details
Drainage Areas

Drawing Status
Preliminary for Planning

Client
DOMUSEA DEVELOPMENTS

Rev.	Date	Details	Initials
A	25.05.24	First Issue	KN

Scales H1:500 | Paper Size A3
Job No. KNC2404
Drawing No. 500-02 | Rev A

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 0 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15	min Summer	7.328	0.028	8.5	0.1	O K
30	min Summer	7.323	0.023	6.9	0.1	O K
60	min Summer	7.318	0.018	5.1	0.0	O K
120	min Summer	7.314	0.014	3.1	0.0	O K
180	min Summer	7.312	0.012	2.4	0.0	O K
240	min Summer	7.311	0.011	2.1	0.0	O K
360	min Summer	7.310	0.010	1.7	0.0	O K
480	min Summer	7.309	0.009	1.2	0.0	O K
600	min Summer	7.308	0.008	1.1	0.0	O K
720	min Summer	7.308	0.008	1.0	0.0	O K
960	min Summer	7.307	0.007	0.9	0.0	O K
1440	min Summer	7.306	0.006	0.6	0.0	O K
2160	min Summer	7.305	0.005	0.4	0.0	O K
2880	min Summer	7.304	0.004	0.3	0.0	O K
4320	min Summer	7.304	0.004	0.2	0.0	O K
5760	min Summer	7.303	0.003	0.2	0.0	O K

	Storm Event	Rain (mm/hr)	Time-Peak (mins)
15	min Summer	163.966	14
30	min Summer	99.917	21
60	min Summer	60.886	38
120	min Summer	37.102	66
180	min Summer	27.769	94
240	min Summer	22.609	128
360	min Summer	16.922	194
480	min Summer	13.777	244
600	min Summer	11.747	300
720	min Summer	10.312	346
960	min Summer	8.002	490
1440	min Summer	5.597	756
2160	min Summer	3.915	1092
2880	min Summer	3.038	1468
4320	min Summer	2.267	2352
5760	min Summer	1.842	2744

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	7.303	0.003	0.1	0.0	O K
8640 min Summer	7.303	0.003	0.1	0.0	O K
10080 min Summer	7.303	0.003	0.1	0.0	O K
15 min Winter	7.325	0.025	7.6	0.1	O K
30 min Winter	7.318	0.018	5.4	0.0	O K
60 min Winter	7.314	0.014	3.3	0.0	O K
120 min Winter	7.312	0.012	2.2	0.0	O K
180 min Winter	7.310	0.010	1.5	0.0	O K
240 min Winter	7.309	0.009	1.2	0.0	O K
360 min Winter	7.308	0.008	1.1	0.0	O K
480 min Winter	7.307	0.007	0.9	0.0	O K
600 min Winter	7.307	0.007	0.7	0.0	O K
720 min Winter	7.307	0.007	0.7	0.0	O K
960 min Winter	7.306	0.006	0.5	0.0	O K
1440 min Winter	7.305	0.005	0.4	0.0	O K
2160 min Winter	7.304	0.004	0.2	0.0	O K
2880 min Winter	7.303	0.003	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3320
8640 min Summer	1.375	4168
10080 min Summer	1.230	5064
15 min Winter	163.966	14
30 min Winter	99.917	21
60 min Winter	60.886	34
120 min Winter	37.102	70
180 min Winter	27.769	92
240 min Winter	22.609	130
360 min Winter	16.922	188
480 min Winter	13.777	228
600 min Winter	11.747	318
720 min Winter	10.312	380
960 min Winter	8.002	468
1440 min Winter	5.597	730
2160 min Winter	3.915	1160
2880 min Winter	3.038	1592

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	7.303	0.003	0.1	0.0	O K
5760 min Winter	7.303	0.003	0.1	0.0	O K
7200 min Winter	7.302	0.002	0.1	0.0	O K
8640 min Winter	7.302	0.002	0.1	0.0	O K
10080 min Winter	7.302	0.002	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	1892
5760 min Winter	1.842	2560
7200 min Winter	1.568	3040
8640 min Winter	1.375	3904
10080 min Winter	1.230	5008

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.008

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.008

Model Details

Storage is Online Cover Level (m) 7.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	1.46520	Width (m)	3.7
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	20.6	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.300	Cap Volume Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 0 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15 min Summer	7.364	0.064	8.5	0.1	O K
30 min Summer	7.350	0.050	6.7	0.0	O K
60 min Summer	7.342	0.042	4.8	0.0	O K
120 min Summer	7.334	0.034	3.1	0.0	O K
180 min Summer	7.330	0.030	2.4	0.0	O K
240 min Summer	7.327	0.027	2.0	0.0	O K
360 min Summer	7.324	0.024	1.6	0.0	O K
480 min Summer	7.322	0.022	1.3	0.0	O K
600 min Summer	7.320	0.020	1.0	0.0	O K
720 min Summer	7.319	0.019	0.9	0.0	O K
960 min Summer	7.317	0.017	0.7	0.0	O K
1440 min Summer	7.314	0.014	0.5	0.0	O K
2160 min Summer	7.312	0.012	0.4	0.0	O K
2880 min Summer	7.311	0.011	0.3	0.0	O K
4320 min Summer	7.309	0.009	0.2	0.0	O K
5760 min Summer	7.308	0.008	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	14
30 min Summer	99.917	22
60 min Summer	60.886	36
120 min Summer	37.102	64
180 min Summer	27.769	96
240 min Summer	22.609	128
360 min Summer	16.922	188
480 min Summer	13.777	244
600 min Summer	11.747	304
720 min Summer	10.312	366
960 min Summer	8.002	494
1440 min Summer	5.597	734
2160 min Summer	3.915	1068
2880 min Summer	3.038	1396
4320 min Summer	2.267	2132
5760 min Summer	1.842	2992

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	7.307	0.007	0.1	0.0	O K
8640 min Summer	7.307	0.007	0.1	0.0	O K
10080 min Summer	7.307	0.007	0.1	0.0	O K
15 min Winter	7.356	0.056	7.5	0.1	O K
30 min Winter	7.344	0.044	5.2	0.0	O K
60 min Winter	7.336	0.036	3.4	0.0	O K
120 min Winter	7.328	0.028	2.1	0.0	O K
180 min Winter	7.325	0.025	1.6	0.0	O K
240 min Winter	7.322	0.022	1.3	0.0	O K
360 min Winter	7.319	0.019	1.0	0.0	O K
480 min Winter	7.317	0.017	0.8	0.0	O K
600 min Winter	7.317	0.017	0.7	0.0	O K
720 min Winter	7.316	0.016	0.7	0.0	O K
960 min Winter	7.314	0.014	0.5	0.0	O K
1440 min Winter	7.312	0.012	0.4	0.0	O K
2160 min Winter	7.310	0.010	0.3	0.0	O K
2880 min Winter	7.309	0.009	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3632
8640 min Summer	1.375	4240
10080 min Summer	1.230	5248
15 min Winter	163.966	14
30 min Winter	99.917	21
60 min Winter	60.886	34
120 min Winter	37.102	68
180 min Winter	27.769	92
240 min Winter	22.609	114
360 min Winter	16.922	180
480 min Winter	13.777	238
600 min Winter	11.747	306
720 min Winter	10.312	346
960 min Winter	8.002	502
1440 min Winter	5.597	700
2160 min Winter	3.915	992
2880 min Winter	3.038	1424

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	7.308	0.008	0.2	0.0	O K
5760 min Winter	7.306	0.006	0.1	0.0	O K
7200 min Winter	7.306	0.006	0.1	0.0	O K
8640 min Winter	7.305	0.005	0.1	0.0	O K
10080 min Winter	7.305	0.005	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2120
5760 min Winter	1.842	2720
7200 min Winter	1.568	3408
8640 min Winter	1.375	4288
10080 min Winter	1.230	4720

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.008

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.008

Model Details

Storage is Online Cover Level (m) 7.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	1.46520	Width (m)	3.7
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	20.6	Slope (1:X)	32.7
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.300	Cap Volume Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 0 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	7.418	0.118	8.4	0.1	O K
30 min Summer	7.394	0.094	6.7	0.1	O K
60 min Summer	7.366	0.066	4.7	0.0	O K
120 min Summer	7.347	0.047	3.2	0.0	O K
180 min Summer	7.341	0.041	2.4	0.0	O K
240 min Summer	7.338	0.038	2.0	0.0	O K
360 min Summer	7.332	0.032	1.5	0.0	O K
480 min Summer	7.329	0.029	1.2	0.0	O K
600 min Summer	7.327	0.027	1.1	0.0	O K
720 min Summer	7.325	0.025	0.9	0.0	O K
960 min Summer	7.322	0.022	0.7	0.0	O K
1440 min Summer	7.319	0.019	0.5	0.0	O K
2160 min Summer	7.316	0.016	0.4	0.0	O K
2880 min Summer	7.314	0.014	0.3	0.0	O K
4320 min Summer	7.313	0.013	0.2	0.0	O K
5760 min Summer	7.311	0.011	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	14
30 min Summer	99.917	21
60 min Summer	60.886	36
120 min Summer	37.102	66
180 min Summer	27.769	100
240 min Summer	22.609	126
360 min Summer	16.922	184
480 min Summer	13.777	250
600 min Summer	11.747	314
720 min Summer	10.312	366
960 min Summer	8.002	482
1440 min Summer	5.597	730
2160 min Summer	3.915	1044
2880 min Summer	3.038	1468
4320 min Summer	2.267	2208
5760 min Summer	1.842	2984

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	7.310	0.010	0.1	0.0	O K
8640 min Summer	7.309	0.009	0.1	0.0	O K
10080 min Summer	7.309	0.009	0.1	0.0	O K
15 min Winter	7.405	0.105	7.5	0.1	O K
30 min Winter	7.374	0.074	5.3	0.1	O K
60 min Winter	7.348	0.048	3.3	0.0	O K
120 min Winter	7.338	0.038	2.1	0.0	O K
180 min Winter	7.334	0.034	1.6	0.0	O K
240 min Winter	7.330	0.030	1.3	0.0	O K
360 min Winter	7.326	0.026	0.9	0.0	O K
480 min Winter	7.323	0.023	0.8	0.0	O K
600 min Winter	7.322	0.022	0.7	0.0	O K
720 min Winter	7.320	0.020	0.6	0.0	O K
960 min Winter	7.319	0.019	0.5	0.0	O K
1440 min Winter	7.315	0.015	0.3	0.0	O K
2160 min Winter	7.313	0.013	0.3	0.0	O K
2880 min Winter	7.312	0.012	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3776
8640 min Summer	1.375	4280
10080 min Summer	1.230	5256
15 min Winter	163.966	14
30 min Winter	99.917	21
60 min Winter	60.886	38
120 min Winter	37.102	70
180 min Winter	27.769	102
240 min Winter	22.609	124
360 min Winter	16.922	170
480 min Winter	13.777	256
600 min Winter	11.747	310
720 min Winter	10.312	364
960 min Winter	8.002	460
1440 min Winter	5.597	700
2160 min Winter	3.915	1092
2880 min Winter	3.038	1432

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	7.310	0.010	0.1	0.0	O K
5760 min Winter	7.309	0.009	0.1	0.0	O K
7200 min Winter	7.308	0.008	0.1	0.0	O K
8640 min Winter	7.308	0.008	0.1	0.0	O K
10080 min Winter	7.307	0.007	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2192
5760 min Winter	1.842	2952
7200 min Winter	1.568	3248
8640 min Winter	1.375	4840
10080 min Winter	1.230	5152

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.008

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.008

Model Details

Storage is Online Cover Level (m) 7.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	1.46520	Width (m)	3.7
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	20.6	Slope (1:X)	17.5
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.300	Cap Volume Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 44 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.132	0.432	0.3	1.0	O K
30 min Summer	6.188	0.488	0.3	1.2	O K
60 min Summer	6.213	0.513	0.3	1.2	O K
120 min Summer	6.210	0.510	0.3	1.2	O K
180 min Summer	6.188	0.488	0.3	1.2	O K
240 min Summer	6.157	0.457	0.3	1.1	O K
360 min Summer	6.087	0.387	0.3	0.9	O K
480 min Summer	6.018	0.318	0.3	0.8	O K
600 min Summer	5.955	0.255	0.3	0.6	O K
720 min Summer	5.900	0.200	0.3	0.5	O K
960 min Summer	5.794	0.094	0.3	0.2	O K
1440 min Summer	5.743	0.043	0.2	0.1	O K
2160 min Summer	5.731	0.031	0.2	0.1	O K
2880 min Summer	5.725	0.025	0.1	0.1	O K
4320 min Summer	5.719	0.019	0.1	0.0	O K
5760 min Summer	5.716	0.016	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	21
30 min Summer	46.335	34
60 min Summer	29.457	52
120 min Summer	18.727	86
180 min Summer	14.368	122
240 min Summer	11.905	156
360 min Summer	9.134	222
480 min Summer	7.568	284
600 min Summer	6.541	346
720 min Summer	5.807	404
960 min Summer	4.586	514
1440 min Summer	3.288	738
2160 min Summer	2.357	1088
2880 min Summer	1.862	1448
4320 min Summer	1.424	2204
5760 min Summer	1.178	2856

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.714	0.014	0.1	0.0	O K
8640 min Summer	5.712	0.012	0.1	0.0	O K
10080 min Summer	5.711	0.011	0.1	0.0	O K
15 min Winter	6.133	0.433	0.3	1.0	O K
30 min Winter	6.191	0.491	0.3	1.2	O K
60 min Winter	6.211	0.511	0.3	1.2	O K
120 min Winter	6.185	0.485	0.3	1.2	O K
180 min Winter	6.132	0.432	0.3	1.0	O K
240 min Winter	6.072	0.372	0.3	0.9	O K
360 min Winter	5.954	0.254	0.3	0.6	O K
480 min Winter	5.854	0.154	0.3	0.4	O K
600 min Winter	5.781	0.081	0.3	0.2	O K
720 min Winter	5.749	0.049	0.3	0.1	O K
960 min Winter	5.739	0.039	0.2	0.1	O K
1440 min Winter	5.728	0.028	0.2	0.1	O K
2160 min Winter	5.720	0.020	0.1	0.0	O K
2880 min Winter	5.716	0.016	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3552
8640 min Summer	0.901	4272
10080 min Summer	0.814	5136
15 min Winter	72.885	21
30 min Winter	46.335	34
60 min Winter	29.457	54
120 min Winter	18.727	92
180 min Winter	14.368	130
240 min Winter	11.905	164
360 min Winter	9.134	230
480 min Winter	7.568	288
600 min Winter	6.541	336
720 min Winter	5.807	372
960 min Winter	4.586	492
1440 min Winter	3.288	730
2160 min Winter	2.357	1076
2880 min Winter	1.862	1440

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.712	0.012	0.1	0.0	O K
5760 min Winter	5.710	0.010	0.1	0.0	O K
7200 min Winter	5.709	0.009	0.1	0.0	O K
8640 min Winter	5.708	0.008	0.0	0.0	O K
10080 min Winter	5.707	0.007	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2192
5760 min Winter	1.178	2864
7200 min Winter	1.016	3664
8640 min Winter	0.901	4296
10080 min Winter	0.814	4984

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 6.400

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.34596	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.700	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 104 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.782	1.082	0.3	2.6	O K
30 min Summer	6.945	1.245	0.3	3.0	O K
60 min Summer	7.063	1.363	0.3	3.3	O K
120 min Summer	7.073	1.373	0.3	3.3	O K
180 min Summer	7.043	1.343	0.3	3.2	O K
240 min Summer	7.011	1.311	0.3	3.1	O K
360 min Summer	6.934	1.234	0.3	3.0	O K
480 min Summer	6.846	1.146	0.3	2.8	O K
600 min Summer	6.753	1.053	0.3	2.5	O K
720 min Summer	6.661	0.961	0.3	2.3	O K
960 min Summer	6.389	0.689	0.3	1.7	O K
1440 min Summer	6.004	0.304	0.3	0.7	O K
2160 min Summer	5.759	0.059	0.3	0.1	O K
2880 min Summer	5.740	0.040	0.2	0.1	O K
4320 min Summer	5.730	0.030	0.2	0.1	O K
5760 min Summer	5.725	0.025	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	36
60 min Summer	60.886	66
120 min Summer	37.102	108
180 min Summer	27.769	140
240 min Summer	22.609	174
360 min Summer	16.922	244
480 min Summer	13.777	312
600 min Summer	11.747	380
720 min Summer	10.312	446
960 min Summer	8.002	570
1440 min Summer	5.597	798
2160 min Summer	3.915	1108
2880 min Summer	3.038	1460
4320 min Summer	2.267	2176
5760 min Summer	1.842	2912

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.721	0.021	0.1	0.1	O K
8640 min Summer	5.718	0.018	0.1	0.0	O K
10080 min Summer	5.716	0.016	0.1	0.0	O K
15 min Winter	6.783	1.083	0.3	2.6	O K
30 min Winter	6.951	1.251	0.3	3.0	O K
60 min Winter	7.076	1.376	0.3	3.3	O K
120 min Winter	7.087	1.387	0.3	3.3	O K
180 min Winter	7.037	1.337	0.3	3.2	O K
240 min Winter	6.981	1.281	0.3	3.1	O K
360 min Winter	6.841	1.141	0.3	2.7	O K
480 min Winter	6.688	0.988	0.3	2.4	O K
600 min Winter	6.536	0.836	0.3	2.0	O K
720 min Winter	6.390	0.690	0.3	1.7	O K
960 min Winter	6.045	0.345	0.3	0.8	O K
1440 min Winter	5.748	0.048	0.3	0.1	O K
2160 min Winter	5.734	0.034	0.2	0.1	O K
2880 min Winter	5.726	0.026	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3656
8640 min Summer	1.375	4352
10080 min Summer	1.230	5136
15 min Winter	163.966	22
30 min Winter	99.917	36
60 min Winter	60.886	64
120 min Winter	37.102	118
180 min Winter	27.769	146
240 min Winter	22.609	184
360 min Winter	16.922	260
480 min Winter	13.777	332
600 min Winter	11.747	402
720 min Winter	10.312	466
960 min Winter	8.002	582
1440 min Winter	5.597	742
2160 min Winter	3.915	1092
2880 min Winter	3.038	1440

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.720	0.020	0.1	0.0	O K
5760 min Winter	5.716	0.016	0.1	0.0	O K
7200 min Winter	5.714	0.014	0.1	0.0	O K
8640 min Winter	5.712	0.012	0.1	0.0	O K
10080 min Winter	5.711	0.011	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2204
5760 min Winter	1.842	2880
7200 min Winter	1.568	3560
8640 min Winter	1.375	4272
10080 min Winter	1.230	5008

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 7.200

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.34596	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.700	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 51 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.099	0.399	0.2	0.8	O K
30 min Summer	6.161	0.461	0.2	0.9	O K
60 min Summer	6.195	0.495	0.2	1.0	O K
120 min Summer	6.204	0.504	0.2	1.0	O K
180 min Summer	6.193	0.493	0.2	0.9	O K
240 min Summer	6.174	0.474	0.2	0.9	O K
360 min Summer	6.125	0.425	0.2	0.8	O K
480 min Summer	6.072	0.372	0.2	0.7	O K
600 min Summer	6.019	0.319	0.2	0.6	O K
720 min Summer	5.970	0.270	0.2	0.5	O K
960 min Summer	5.856	0.156	0.2	0.3	O K
1440 min Summer	5.752	0.052	0.2	0.1	O K
2160 min Summer	5.737	0.037	0.1	0.1	O K
2880 min Summer	5.729	0.029	0.1	0.1	O K
4320 min Summer	5.722	0.022	0.1	0.0	O K
5760 min Summer	5.719	0.019	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	21
30 min Summer	46.335	35
60 min Summer	29.457	56
120 min Summer	18.727	90
180 min Summer	14.368	124
240 min Summer	11.905	160
360 min Summer	9.134	228
480 min Summer	7.568	292
600 min Summer	6.541	356
720 min Summer	5.807	416
960 min Summer	4.586	532
1440 min Summer	3.288	740
2160 min Summer	2.357	1104
2880 min Summer	1.862	1456
4320 min Summer	1.424	2176
5760 min Summer	1.178	2920

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.716	0.016	0.1	0.0	O K
8640 min Summer	5.714	0.014	0.0	0.0	O K
10080 min Summer	5.713	0.013	0.0	0.0	O K
15 min Winter	6.100	0.400	0.2	0.8	O K
30 min Winter	6.163	0.463	0.2	0.9	O K
60 min Winter	6.196	0.496	0.2	1.0	O K
120 min Winter	6.191	0.491	0.2	0.9	O K
180 min Winter	6.158	0.458	0.2	0.9	O K
240 min Winter	6.116	0.416	0.2	0.8	O K
360 min Winter	6.025	0.325	0.2	0.6	O K
480 min Winter	5.938	0.238	0.2	0.5	O K
600 min Winter	5.861	0.161	0.2	0.3	O K
720 min Winter	5.801	0.101	0.2	0.2	O K
960 min Winter	5.746	0.046	0.2	0.1	O K
1440 min Winter	5.733	0.033	0.1	0.1	O K
2160 min Winter	5.724	0.024	0.1	0.0	O K
2880 min Winter	5.719	0.019	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3672
8640 min Summer	0.901	4368
10080 min Summer	0.814	5072
15 min Winter	72.885	21
30 min Winter	46.335	35
60 min Winter	29.457	60
120 min Winter	18.727	94
180 min Winter	14.368	134
240 min Winter	11.905	170
360 min Winter	9.134	238
480 min Winter	7.568	302
600 min Winter	6.541	360
720 min Winter	5.807	412
960 min Winter	4.586	494
1440 min Winter	3.288	734
2160 min Winter	2.357	1068
2880 min Winter	1.862	1424

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.715	0.015	0.1	0.0	O K
5760 min Winter	5.712	0.012	0.0	0.0	O K
7200 min Winter	5.710	0.010	0.0	0.0	O K
8640 min Winter	5.709	0.009	0.0	0.0	O K
10080 min Winter	5.708	0.008	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2204
5760 min Winter	1.178	2920
7200 min Winter	1.016	3536
8640 min Winter	0.901	4264
10080 min Winter	0.814	5056

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.005

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.005

Model Details

Storage is Online Cover Level (m) 6.400

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	4.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.700	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 132 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.682	0.982	0.2	1.9	O K
30 min Summer	6.840	1.140	0.2	2.2	O K
60 min Summer	6.973	1.273	0.2	2.4	O K
120 min Summer	7.020	1.320	0.2	2.5	O K
180 min Summer	7.001	1.301	0.2	2.5	O K
240 min Summer	6.978	1.278	0.2	2.5	O K
360 min Summer	6.927	1.227	0.2	2.4	O K
480 min Summer	6.865	1.165	0.2	2.2	O K
600 min Summer	6.798	1.098	0.2	2.1	O K
720 min Summer	6.728	1.028	0.2	2.0	O K
960 min Summer	6.498	0.798	0.2	1.5	O K
1440 min Summer	6.139	0.439	0.2	0.8	O K
2160 min Summer	5.833	0.133	0.2	0.3	O K
2880 min Summer	5.748	0.048	0.2	0.1	O K
4320 min Summer	5.736	0.036	0.1	0.1	O K
5760 min Summer	5.729	0.029	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	36
60 min Summer	60.886	66
120 min Summer	37.102	122
180 min Summer	27.769	150
240 min Summer	22.609	184
360 min Summer	16.922	252
480 min Summer	13.777	320
600 min Summer	11.747	390
720 min Summer	10.312	458
960 min Summer	8.002	582
1440 min Summer	5.597	826
2160 min Summer	3.915	1148
2880 min Summer	3.038	1468
4320 min Summer	2.267	2172
5760 min Summer	1.842	2872

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.725	0.025	0.1	0.0	O K
8640 min Summer	5.722	0.022	0.1	0.0	O K
10080 min Summer	5.719	0.019	0.1	0.0	O K
15 min Winter	6.683	0.983	0.2	1.9	O K
30 min Winter	6.845	1.145	0.2	2.2	O K
60 min Winter	6.983	1.283	0.2	2.5	O K
120 min Winter	7.040	1.340	0.2	2.6	O K
180 min Winter	7.004	1.304	0.2	2.5	O K
240 min Winter	6.969	1.269	0.2	2.4	O K
360 min Winter	6.876	1.176	0.2	2.3	O K
480 min Winter	6.766	1.066	0.2	2.0	O K
600 min Winter	6.650	0.950	0.2	1.8	O K
720 min Winter	6.534	0.834	0.2	1.6	O K
960 min Winter	6.224	0.524	0.2	1.0	O K
1440 min Winter	5.816	0.116	0.2	0.2	O K
2160 min Winter	5.740	0.040	0.1	0.1	O K
2880 min Winter	5.731	0.031	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3640
8640 min Summer	1.375	4376
10080 min Summer	1.230	5032
15 min Winter	163.966	22
30 min Winter	99.917	36
60 min Winter	60.886	64
120 min Winter	37.102	120
180 min Winter	27.769	154
240 min Winter	22.609	190
360 min Winter	16.922	268
480 min Winter	13.777	342
600 min Winter	11.747	414
720 min Winter	10.312	482
960 min Winter	8.002	608
1440 min Winter	5.597	800
2160 min Winter	3.915	1092
2880 min Winter	3.038	1436

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.723	0.023	0.1	0.0	O K
5760 min Winter	5.719	0.019	0.1	0.0	O K
7200 min Winter	5.716	0.016	0.1	0.0	O K
8640 min Winter	5.714	0.014	0.0	0.0	O K
10080 min Winter	5.713	0.013	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2200
5760 min Winter	1.842	2912
7200 min Winter	1.568	3672
8640 min Winter	1.375	4280
10080 min Winter	1.230	4976

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.005

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.005

Model Details

Storage is Online Cover Level (m) 7.200

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	4.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.700	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 29 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.536	0.236	0.2	0.6	O K
30 min Summer	5.560	0.260	0.2	0.6	O K
60 min Summer	5.570	0.270	0.2	0.6	O K
120 min Summer	5.557	0.257	0.2	0.6	O K
180 min Summer	5.533	0.233	0.2	0.6	O K
240 min Summer	5.508	0.208	0.2	0.5	O K
360 min Summer	5.458	0.158	0.2	0.4	O K
480 min Summer	5.417	0.117	0.2	0.3	O K
600 min Summer	5.386	0.086	0.2	0.2	O K
720 min Summer	5.364	0.064	0.2	0.2	O K
960 min Summer	5.345	0.045	0.2	0.1	O K
1440 min Summer	5.333	0.033	0.1	0.1	O K
2160 min Summer	5.324	0.024	0.1	0.1	O K
2880 min Summer	5.319	0.019	0.1	0.0	O K
4320 min Summer	5.314	0.014	0.1	0.0	O K
5760 min Summer	5.312	0.012	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	20
30 min Summer	46.335	31
60 min Summer	29.457	48
120 min Summer	18.727	82
180 min Summer	14.368	116
240 min Summer	11.905	150
360 min Summer	9.134	212
480 min Summer	7.568	270
600 min Summer	6.541	326
720 min Summer	5.807	382
960 min Summer	4.586	494
1440 min Summer	3.288	738
2160 min Summer	2.357	1104
2880 min Summer	1.862	1464
4320 min Summer	1.424	2140
5760 min Summer	1.178	2936

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
7200 min Summer	5.310	0.010	0.0	0.0	O K
8640 min Summer	5.309	0.009	0.0	0.0	O K
10080 min Summer	5.308	0.008	0.0	0.0	O K
15 min Winter	5.536	0.236	0.2	0.6	O K
30 min Winter	5.560	0.260	0.2	0.6	O K
60 min Winter	5.562	0.262	0.2	0.6	O K
120 min Winter	5.529	0.229	0.2	0.5	O K
180 min Winter	5.485	0.185	0.2	0.4	O K
240 min Winter	5.442	0.142	0.2	0.3	O K
360 min Winter	5.375	0.075	0.2	0.2	O K
480 min Winter	5.348	0.048	0.2	0.1	O K
600 min Winter	5.342	0.042	0.2	0.1	O K
720 min Winter	5.337	0.037	0.2	0.1	O K
960 min Winter	5.329	0.029	0.1	0.1	O K
1440 min Winter	5.321	0.021	0.1	0.1	O K
2160 min Winter	5.315	0.015	0.1	0.0	O K
2880 min Winter	5.312	0.012	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3560
8640 min Summer	0.901	4256
10080 min Summer	0.814	5128
15 min Winter	72.885	20
30 min Winter	46.335	33
60 min Winter	29.457	50
120 min Winter	18.727	88
180 min Winter	14.368	122
240 min Winter	11.905	154
360 min Winter	9.134	210
480 min Winter	7.568	256
600 min Winter	6.541	312
720 min Winter	5.807	372
960 min Winter	4.586	496
1440 min Winter	3.288	728
2160 min Winter	2.357	1084
2880 min Winter	1.862	1424

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.309	0.009	0.0	0.0	O K
5760 min Winter	5.308	0.008	0.0	0.0	O K
7200 min Winter	5.307	0.007	0.0	0.0	O K
8640 min Winter	5.306	0.006	0.0	0.0	O K
10080 min Winter	5.305	0.005	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2204
5760 min Winter	1.178	2928
7200 min Winter	1.016	3584
8640 min Winter	0.901	4336
10080 min Winter	0.814	5176

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.004

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.004

Model Details

Storage is Online Cover Level (m) 5.700

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 77 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15	min Summer	5.802	0.602	0.2	1.4	O K
30	min Summer	5.881	0.681	0.2	1.6	O K
60	min Summer	5.921	0.721	0.2	1.7	O K
120	min Summer	5.907	0.707	0.2	1.7	O K
180	min Summer	5.882	0.682	0.2	1.6	O K
240	min Summer	5.852	0.652	0.2	1.6	O K
360	min Summer	5.785	0.585	0.2	1.4	O K
480	min Summer	5.715	0.515	0.2	1.2	O K
600	min Summer	5.647	0.447	0.2	1.1	O K
720	min Summer	5.583	0.383	0.2	0.9	O K
960	min Summer	5.431	0.231	0.2	0.6	O K
1440	min Summer	5.270	0.070	0.2	0.2	O K
2160	min Summer	5.239	0.039	0.2	0.1	O K
2880	min Summer	5.230	0.030	0.1	0.1	O K
4320	min Summer	5.223	0.023	0.1	0.1	O K
5760	min Summer	5.219	0.019	0.1	0.0	O K

	Storm Event	Rain (mm/hr)	Time-Peak (mins)
15	min Summer	163.966	22
30	min Summer	99.917	36
60	min Summer	60.886	64
120	min Summer	37.102	96
180	min Summer	27.769	130
240	min Summer	22.609	164
360	min Summer	16.922	232
480	min Summer	13.777	300
600	min Summer	11.747	364
720	min Summer	10.312	426
960	min Summer	8.002	542
1440	min Summer	5.597	754
2160	min Summer	3.915	1096
2880	min Summer	3.038	1472
4320	min Summer	2.267	2156
5760	min Summer	1.842	2912

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.216	0.016	0.1	0.0	O K
8640 min Summer	5.214	0.014	0.1	0.0	O K
10080 min Summer	5.213	0.013	0.1	0.0	O K
15 min Winter	5.803	0.603	0.2	1.4	O K
30 min Winter	5.885	0.685	0.2	1.6	O K
60 min Winter	5.928	0.728	0.2	1.7	O K
120 min Winter	5.904	0.704	0.2	1.7	O K
180 min Winter	5.859	0.659	0.2	1.6	O K
240 min Winter	5.806	0.606	0.2	1.5	O K
360 min Winter	5.691	0.491	0.2	1.2	O K
480 min Winter	5.580	0.380	0.2	0.9	O K
600 min Winter	5.479	0.279	0.2	0.7	O K
720 min Winter	5.392	0.192	0.2	0.5	O K
960 min Winter	5.254	0.054	0.2	0.1	O K
1440 min Winter	5.236	0.036	0.2	0.1	O K
2160 min Winter	5.225	0.025	0.1	0.1	O K
2880 min Winter	5.220	0.020	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3608
8640 min Summer	1.375	4264
10080 min Summer	1.230	5128
15 min Winter	163.966	21
30 min Winter	99.917	35
60 min Winter	60.886	62
120 min Winter	37.102	100
180 min Winter	27.769	138
240 min Winter	22.609	176
360 min Winter	16.922	248
480 min Winter	13.777	314
600 min Winter	11.747	376
720 min Winter	10.312	432
960 min Winter	8.002	508
1440 min Winter	5.597	732
2160 min Winter	3.915	1072
2880 min Winter	3.038	1452

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.215	0.015	0.1	0.0	O K
5760 min Winter	5.212	0.012	0.1	0.0	O K
7200 min Winter	5.210	0.010	0.0	0.0	O K
8640 min Winter	5.209	0.009	0.0	0.0	O K
10080 min Winter	5.208	0.008	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2144
5760 min Winter	1.842	2912
7200 min Winter	1.568	3656
8640 min Winter	1.375	4312
10080 min Winter	1.230	5040

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.004

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.004

Model Details

Storage is Online Cover Level (m) 6.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.200	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 28 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.525	0.225	0.3	0.7	O K
30 min Summer	5.548	0.248	0.3	0.8	O K
60 min Summer	5.555	0.255	0.3	0.8	O K
120 min Summer	5.541	0.241	0.3	0.8	O K
180 min Summer	5.518	0.218	0.3	0.7	O K
240 min Summer	5.492	0.192	0.3	0.6	O K
360 min Summer	5.444	0.144	0.3	0.4	O K
480 min Summer	5.405	0.105	0.3	0.3	O K
600 min Summer	5.376	0.076	0.3	0.2	O K
720 min Summer	5.357	0.057	0.3	0.2	O K
960 min Summer	5.343	0.043	0.2	0.1	O K
1440 min Summer	5.331	0.031	0.2	0.1	O K
2160 min Summer	5.323	0.023	0.1	0.1	O K
2880 min Summer	5.318	0.018	0.1	0.1	O K
4320 min Summer	5.314	0.014	0.1	0.0	O K
5760 min Summer	5.312	0.012	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	20
30 min Summer	46.335	31
60 min Summer	29.457	48
120 min Summer	18.727	82
180 min Summer	14.368	116
240 min Summer	11.905	148
360 min Summer	9.134	210
480 min Summer	7.568	268
600 min Summer	6.541	324
720 min Summer	5.807	380
960 min Summer	4.586	494
1440 min Summer	3.288	738
2160 min Summer	2.357	1096
2880 min Summer	1.862	1468
4320 min Summer	1.424	2148
5760 min Summer	1.178	2912

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.310	0.010	0.1	0.0	O K
8640 min Summer	5.309	0.009	0.0	0.0	O K
10080 min Summer	5.308	0.008	0.0	0.0	O K
15 min Winter	5.525	0.225	0.3	0.7	O K
30 min Winter	5.547	0.247	0.3	0.8	O K
60 min Winter	5.547	0.247	0.3	0.8	O K
120 min Winter	5.512	0.212	0.3	0.7	O K
180 min Winter	5.468	0.168	0.3	0.5	O K
240 min Winter	5.427	0.127	0.3	0.4	O K
360 min Winter	5.365	0.065	0.3	0.2	O K
480 min Winter	5.346	0.046	0.3	0.1	O K
600 min Winter	5.340	0.040	0.2	0.1	O K
720 min Winter	5.336	0.036	0.2	0.1	O K
960 min Winter	5.328	0.028	0.2	0.1	O K
1440 min Winter	5.320	0.020	0.1	0.1	O K
2160 min Winter	5.315	0.015	0.1	0.0	O K
2880 min Winter	5.312	0.012	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3672
8640 min Summer	0.901	4352
10080 min Summer	0.814	5088
15 min Winter	72.885	20
30 min Winter	46.335	32
60 min Winter	29.457	50
120 min Winter	18.727	88
180 min Winter	14.368	122
240 min Winter	11.905	152
360 min Winter	9.134	206
480 min Winter	7.568	254
600 min Winter	6.541	312
720 min Winter	5.807	372
960 min Winter	4.586	496
1440 min Winter	3.288	740
2160 min Winter	2.357	1096
2880 min Winter	1.862	1452

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.309	0.009	0.1	0.0	O K
5760 min Winter	5.308	0.008	0.0	0.0	O K
7200 min Winter	5.307	0.007	0.0	0.0	O K
8640 min Winter	5.306	0.006	0.0	0.0	O K
10080 min Winter	5.305	0.005	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2188
5760 min Winter	1.178	2888
7200 min Winter	1.016	3640
8640 min Winter	0.901	4384
10080 min Winter	0.814	5096

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.005

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.005

Model Details

Storage is Online Cover Level (m) 5.700

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	6.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 73 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.876	0.576	0.3	1.8	O K
30 min Summer	5.950	0.650	0.3	2.0	O K
60 min Summer	5.984	0.684	0.3	2.1	O K
120 min Summer	5.969	0.669	0.3	2.1	O K
180 min Summer	5.943	0.643	0.3	2.0	O K
240 min Summer	5.913	0.613	0.3	1.9	O K
360 min Summer	5.845	0.545	0.3	1.7	O K
480 min Summer	5.775	0.475	0.3	1.5	O K
600 min Summer	5.708	0.408	0.3	1.3	O K
720 min Summer	5.645	0.345	0.3	1.1	O K
960 min Summer	5.502	0.202	0.3	0.6	O K
1440 min Summer	5.360	0.060	0.3	0.2	O K
2160 min Summer	5.338	0.038	0.2	0.1	O K
2880 min Summer	5.329	0.029	0.2	0.1	O K
4320 min Summer	5.322	0.022	0.1	0.1	O K
5760 min Summer	5.318	0.018	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	36
60 min Summer	60.886	64
120 min Summer	37.102	94
180 min Summer	27.769	130
240 min Summer	22.609	164
360 min Summer	16.922	232
480 min Summer	13.777	298
600 min Summer	11.747	362
720 min Summer	10.312	424
960 min Summer	8.002	536
1440 min Summer	5.597	742
2160 min Summer	3.915	1104
2880 min Summer	3.038	1460
4320 min Summer	2.267	2204
5760 min Summer	1.842	2880

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
7200 min Summer	5.315	0.015	0.1	0.0	O K
8640 min Summer	5.313	0.013	0.1	0.0	O K
10080 min Summer	5.312	0.012	0.1	0.0	O K
15 min Winter	5.877	0.577	0.3	1.8	O K
30 min Winter	5.954	0.654	0.3	2.0	O K
60 min Winter	5.991	0.691	0.3	2.2	O K
120 min Winter	5.964	0.664	0.3	2.1	O K
180 min Winter	5.918	0.618	0.3	1.9	O K
240 min Winter	5.864	0.564	0.3	1.8	O K
360 min Winter	5.749	0.449	0.3	1.4	O K
480 min Winter	5.639	0.339	0.3	1.1	O K
600 min Winter	5.542	0.242	0.3	0.8	O K
720 min Winter	5.460	0.160	0.3	0.5	O K
960 min Winter	5.349	0.049	0.3	0.2	O K
1440 min Winter	5.335	0.035	0.2	0.1	O K
2160 min Winter	5.324	0.024	0.1	0.1	O K
2880 min Winter	5.319	0.019	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3648
8640 min Summer	1.375	4360
10080 min Summer	1.230	5072
15 min Winter	163.966	21
30 min Winter	99.917	35
60 min Winter	60.886	62
120 min Winter	37.102	98
180 min Winter	27.769	138
240 min Winter	22.609	174
360 min Winter	16.922	246
480 min Winter	13.777	310
600 min Winter	11.747	372
720 min Winter	10.312	426
960 min Winter	8.002	496
1440 min Winter	5.597	730
2160 min Winter	3.915	1104
2880 min Winter	3.038	1472

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.314	0.014	0.1	0.0	O K
5760 min Winter	5.312	0.012	0.1	0.0	O K
7200 min Winter	5.310	0.010	0.1	0.0	O K
8640 min Winter	5.309	0.009	0.0	0.0	O K
10080 min Winter	5.308	0.008	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2176
5760 min Winter	1.842	2848
7200 min Winter	1.568	3568
8640 min Winter	1.375	4376
10080 min Winter	1.230	5024

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.005

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.005

Model Details

Storage is Online Cover Level (m) 6.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	6.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 27 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.519	0.219	0.4	1.0	O K
30 min Summer	5.540	0.240	0.4	1.1	O K
60 min Summer	5.546	0.246	0.4	1.1	O K
120 min Summer	5.531	0.231	0.4	1.0	O K
180 min Summer	5.508	0.208	0.4	0.9	O K
240 min Summer	5.482	0.182	0.4	0.8	O K
360 min Summer	5.435	0.135	0.4	0.6	O K
480 min Summer	5.397	0.097	0.4	0.4	O K
600 min Summer	5.370	0.070	0.4	0.3	O K
720 min Summer	5.354	0.054	0.4	0.2	O K
960 min Summer	5.342	0.042	0.3	0.2	O K
1440 min Summer	5.331	0.031	0.3	0.1	O K
2160 min Summer	5.322	0.022	0.2	0.1	O K
2880 min Summer	5.318	0.018	0.1	0.1	O K
4320 min Summer	5.314	0.014	0.1	0.1	O K
5760 min Summer	5.311	0.011	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	20
30 min Summer	46.335	30
60 min Summer	29.457	48
120 min Summer	18.727	82
180 min Summer	14.368	116
240 min Summer	11.905	148
360 min Summer	9.134	210
480 min Summer	7.568	268
600 min Summer	6.541	324
720 min Summer	5.807	376
960 min Summer	4.586	494
1440 min Summer	3.288	738
2160 min Summer	2.357	1096
2880 min Summer	1.862	1460
4320 min Summer	1.424	2200
5760 min Summer	1.178	2880

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.310	0.010	0.1	0.0	O K
8640 min Summer	5.309	0.009	0.1	0.0	O K
10080 min Summer	5.308	0.008	0.1	0.0	O K
15 min Winter	5.518	0.218	0.4	1.0	O K
30 min Winter	5.538	0.238	0.4	1.1	O K
60 min Winter	5.538	0.238	0.4	1.1	O K
120 min Winter	5.502	0.202	0.4	0.9	O K
180 min Winter	5.459	0.159	0.4	0.7	O K
240 min Winter	5.418	0.118	0.4	0.5	O K
360 min Winter	5.360	0.060	0.4	0.3	O K
480 min Winter	5.345	0.045	0.4	0.2	O K
600 min Winter	5.339	0.039	0.3	0.2	O K
720 min Winter	5.335	0.035	0.3	0.2	O K
960 min Winter	5.328	0.028	0.2	0.1	O K
1440 min Winter	5.320	0.020	0.2	0.1	O K
2160 min Winter	5.314	0.014	0.1	0.1	O K
2880 min Winter	5.311	0.011	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3648
8640 min Summer	0.901	4272
10080 min Summer	0.814	5024
15 min Winter	72.885	20
30 min Winter	46.335	32
60 min Winter	29.457	50
120 min Winter	18.727	86
180 min Winter	14.368	120
240 min Winter	11.905	152
360 min Winter	9.134	204
480 min Winter	7.568	256
600 min Winter	6.541	312
720 min Winter	5.807	374
960 min Winter	4.586	490
1440 min Winter	3.288	740
2160 min Winter	2.357	1072
2880 min Winter	1.862	1416

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
4320 min Winter	5.309	0.009	0.1	0.0	O K
5760 min Winter	5.307	0.007	0.1	0.0	O K
7200 min Winter	5.306	0.006	0.1	0.0	O K
8640 min Winter	5.306	0.006	0.0	0.0	O K
10080 min Winter	5.305	0.005	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2140
5760 min Winter	1.178	2912
7200 min Winter	1.016	3656
8640 min Winter	0.901	4536
10080 min Winter	0.814	5176

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 5.700

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	8.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 70 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.860	0.560	0.4	2.5	O K
30 min Summer	5.930	0.630	0.4	2.8	O K
60 min Summer	5.961	0.661	0.4	3.0	O K
120 min Summer	5.946	0.646	0.4	2.9	O K
180 min Summer	5.919	0.619	0.4	2.8	O K
240 min Summer	5.888	0.588	0.4	2.6	O K
360 min Summer	5.820	0.520	0.4	2.3	O K
480 min Summer	5.751	0.451	0.4	2.0	O K
600 min Summer	5.684	0.384	0.4	1.7	O K
720 min Summer	5.622	0.322	0.4	1.4	O K
960 min Summer	5.485	0.185	0.4	0.8	O K
1440 min Summer	5.355	0.055	0.4	0.2	O K
2160 min Summer	5.337	0.037	0.3	0.2	O K
2880 min Summer	5.329	0.029	0.2	0.1	O K
4320 min Summer	5.321	0.021	0.2	0.1	O K
5760 min Summer	5.317	0.017	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	36
60 min Summer	60.886	64
120 min Summer	37.102	94
180 min Summer	27.769	128
240 min Summer	22.609	162
360 min Summer	16.922	230
480 min Summer	13.777	296
600 min Summer	11.747	360
720 min Summer	10.312	422
960 min Summer	8.002	534
1440 min Summer	5.597	740
2160 min Summer	3.915	1096
2880 min Summer	3.038	1464
4320 min Summer	2.267	2188
5760 min Summer	1.842	2848

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
7200 min Summer	5.315	0.015	0.1	0.1	O K
8640 min Summer	5.313	0.013	0.1	0.1	O K
10080 min Summer	5.312	0.012	0.1	0.1	O K
15 min Winter	5.861	0.561	0.4	2.5	O K
30 min Winter	5.934	0.634	0.4	2.8	O K
60 min Winter	5.968	0.668	0.4	3.0	O K
120 min Winter	5.939	0.639	0.4	2.9	O K
180 min Winter	5.892	0.592	0.4	2.7	O K
240 min Winter	5.838	0.538	0.4	2.4	O K
360 min Winter	5.723	0.423	0.4	1.9	O K
480 min Winter	5.615	0.315	0.4	1.4	O K
600 min Winter	5.520	0.220	0.4	1.0	O K
720 min Winter	5.441	0.141	0.4	0.6	O K
960 min Winter	5.348	0.048	0.4	0.2	O K
1440 min Winter	5.334	0.034	0.3	0.2	O K
2160 min Winter	5.324	0.024	0.2	0.1	O K
2880 min Winter	5.319	0.019	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3640
8640 min Summer	1.375	4328
10080 min Summer	1.230	5040
15 min Winter	163.966	21
30 min Winter	99.917	35
60 min Winter	60.886	62
120 min Winter	37.102	98
180 min Winter	27.769	136
240 min Winter	22.609	174
360 min Winter	16.922	244
480 min Winter	13.777	308
600 min Winter	11.747	368
720 min Winter	10.312	424
960 min Winter	8.002	494
1440 min Winter	5.597	738
2160 min Winter	3.915	1104
2880 min Winter	3.038	1460

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.314	0.014	0.1	0.1	O K
5760 min Winter	5.311	0.011	0.1	0.0	O K
7200 min Winter	5.310	0.010	0.1	0.0	O K
8640 min Winter	5.309	0.009	0.1	0.0	O K
10080 min Winter	5.308	0.008	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2208
5760 min Winter	1.842	2928
7200 min Winter	1.568	3688
8640 min Winter	1.375	4384
10080 min Winter	1.230	5072

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 6.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	8.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 44 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	7.832	0.432	0.3	1.0	O K
30 min Summer	7.888	0.488	0.3	1.2	O K
60 min Summer	7.913	0.513	0.3	1.2	O K
120 min Summer	7.910	0.510	0.3	1.2	O K
180 min Summer	7.888	0.488	0.3	1.2	O K
240 min Summer	7.857	0.457	0.3	1.1	O K
360 min Summer	7.787	0.387	0.3	0.9	O K
480 min Summer	7.718	0.318	0.3	0.8	O K
600 min Summer	7.655	0.255	0.3	0.6	O K
720 min Summer	7.600	0.200	0.3	0.5	O K
960 min Summer	7.494	0.094	0.3	0.2	O K
1440 min Summer	7.443	0.043	0.2	0.1	O K
2160 min Summer	7.431	0.031	0.2	0.1	O K
2880 min Summer	7.425	0.025	0.1	0.1	O K
4320 min Summer	7.419	0.019	0.1	0.0	O K
5760 min Summer	7.416	0.016	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	21
30 min Summer	46.335	34
60 min Summer	29.457	52
120 min Summer	18.727	86
180 min Summer	14.368	122
240 min Summer	11.905	156
360 min Summer	9.134	222
480 min Summer	7.568	284
600 min Summer	6.541	346
720 min Summer	5.807	404
960 min Summer	4.586	514
1440 min Summer	3.288	738
2160 min Summer	2.357	1088
2880 min Summer	1.862	1448
4320 min Summer	1.424	2204
5760 min Summer	1.178	2856

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	7.414	0.014	0.1	0.0	O K
8640 min Summer	7.412	0.012	0.1	0.0	O K
10080 min Summer	7.411	0.011	0.1	0.0	O K
15 min Winter	7.833	0.433	0.3	1.0	O K
30 min Winter	7.891	0.491	0.3	1.2	O K
60 min Winter	7.911	0.511	0.3	1.2	O K
120 min Winter	7.885	0.485	0.3	1.2	O K
180 min Winter	7.832	0.432	0.3	1.0	O K
240 min Winter	7.772	0.372	0.3	0.9	O K
360 min Winter	7.654	0.254	0.3	0.6	O K
480 min Winter	7.554	0.154	0.3	0.4	O K
600 min Winter	7.481	0.081	0.3	0.2	O K
720 min Winter	7.449	0.049	0.3	0.1	O K
960 min Winter	7.439	0.039	0.2	0.1	O K
1440 min Winter	7.428	0.028	0.2	0.1	O K
2160 min Winter	7.420	0.020	0.1	0.0	O K
2880 min Winter	7.416	0.016	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3552
8640 min Summer	0.901	4272
10080 min Summer	0.814	5136
15 min Winter	72.885	21
30 min Winter	46.335	34
60 min Winter	29.457	54
120 min Winter	18.727	92
180 min Winter	14.368	130
240 min Winter	11.905	164
360 min Winter	9.134	230
480 min Winter	7.568	288
600 min Winter	6.541	336
720 min Winter	5.807	372
960 min Winter	4.586	492
1440 min Winter	3.288	730
2160 min Winter	2.357	1076
2880 min Winter	1.862	1440

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	7.412	0.012	0.1	0.0	O K
5760 min Winter	7.410	0.010	0.1	0.0	O K
7200 min Winter	7.409	0.009	0.1	0.0	O K
8640 min Winter	7.408	0.008	0.0	0.0	O K
10080 min Winter	7.407	0.007	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2192
5760 min Winter	1.178	2864
7200 min Winter	1.016	3664
8640 min Winter	0.901	4296
10080 min Winter	0.814	4984

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 8.400

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.34596	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	7.400	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 104 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	7.582	1.082	0.3	2.6	O K
30 min Summer	7.745	1.245	0.3	3.0	O K
60 min Summer	7.863	1.363	0.3	3.3	O K
120 min Summer	7.873	1.373	0.3	3.3	O K
180 min Summer	7.843	1.343	0.3	3.2	O K
240 min Summer	7.811	1.311	0.3	3.1	O K
360 min Summer	7.734	1.234	0.3	3.0	O K
480 min Summer	7.646	1.146	0.3	2.8	O K
600 min Summer	7.553	1.053	0.3	2.5	O K
720 min Summer	7.461	0.961	0.3	2.3	O K
960 min Summer	7.189	0.689	0.3	1.7	O K
1440 min Summer	6.804	0.304	0.3	0.7	O K
2160 min Summer	6.559	0.059	0.3	0.1	O K
2880 min Summer	6.540	0.040	0.2	0.1	O K
4320 min Summer	6.530	0.030	0.2	0.1	O K
5760 min Summer	6.525	0.025	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	36
60 min Summer	60.886	66
120 min Summer	37.102	108
180 min Summer	27.769	140
240 min Summer	22.609	174
360 min Summer	16.922	244
480 min Summer	13.777	312
600 min Summer	11.747	380
720 min Summer	10.312	446
960 min Summer	8.002	570
1440 min Summer	5.597	798
2160 min Summer	3.915	1108
2880 min Summer	3.038	1460
4320 min Summer	2.267	2176
5760 min Summer	1.842	2912

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	6.521	0.021	0.1	0.1	O K
8640 min Summer	6.518	0.018	0.1	0.0	O K
10080 min Summer	6.516	0.016	0.1	0.0	O K
15 min Winter	7.583	1.083	0.3	2.6	O K
30 min Winter	7.751	1.251	0.3	3.0	O K
60 min Winter	7.876	1.376	0.3	3.3	O K
120 min Winter	7.887	1.387	0.3	3.3	O K
180 min Winter	7.837	1.337	0.3	3.2	O K
240 min Winter	7.781	1.281	0.3	3.1	O K
360 min Winter	7.641	1.141	0.3	2.7	O K
480 min Winter	7.488	0.988	0.3	2.4	O K
600 min Winter	7.336	0.836	0.3	2.0	O K
720 min Winter	7.190	0.690	0.3	1.7	O K
960 min Winter	6.845	0.345	0.3	0.8	O K
1440 min Winter	6.548	0.048	0.3	0.1	O K
2160 min Winter	6.534	0.034	0.2	0.1	O K
2880 min Winter	6.526	0.026	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3656
8640 min Summer	1.375	4352
10080 min Summer	1.230	5136
15 min Winter	163.966	22
30 min Winter	99.917	36
60 min Winter	60.886	64
120 min Winter	37.102	118
180 min Winter	27.769	146
240 min Winter	22.609	184
360 min Winter	16.922	260
480 min Winter	13.777	332
600 min Winter	11.747	402
720 min Winter	10.312	466
960 min Winter	8.002	582
1440 min Winter	5.597	742
2160 min Winter	3.915	1092
2880 min Winter	3.038	1440

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	6.520	0.020	0.1	0.0	O K
5760 min Winter	6.516	0.016	0.1	0.0	O K
7200 min Winter	6.514	0.014	0.1	0.0	O K
8640 min Winter	6.512	0.012	0.1	0.0	O K
10080 min Winter	6.511	0.011	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2204
5760 min Winter	1.842	2880
7200 min Winter	1.568	3560
8640 min Winter	1.375	4272
10080 min Winter	1.230	5008

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.007

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.007

Model Details

Storage is Online Cover Level (m) 8.400

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.34596	Trench Width (m)	1.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	6.500	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 59 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.443	0.443	0.3	1.2	O K
30 min Summer	6.517	0.517	0.3	1.4	O K
60 min Summer	6.561	0.561	0.3	1.6	O K
120 min Summer	6.576	0.576	0.3	1.6	O K
180 min Summer	6.569	0.569	0.3	1.6	O K
240 min Summer	6.553	0.553	0.3	1.5	O K
360 min Summer	6.507	0.507	0.3	1.4	O K
480 min Summer	6.455	0.455	0.3	1.3	O K
600 min Summer	6.401	0.401	0.3	1.1	O K
720 min Summer	6.349	0.349	0.3	1.0	O K
960 min Summer	6.217	0.217	0.3	0.6	O K
1440 min Summer	6.072	0.072	0.3	0.2	O K
2160 min Summer	6.040	0.040	0.2	0.1	O K
2880 min Summer	6.032	0.032	0.2	0.1	O K
4320 min Summer	6.025	0.025	0.1	0.1	O K
5760 min Summer	6.020	0.020	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	21
30 min Summer	46.335	35
60 min Summer	29.457	58
120 min Summer	18.727	92
180 min Summer	14.368	128
240 min Summer	11.905	162
360 min Summer	9.134	230
480 min Summer	7.568	296
600 min Summer	6.541	360
720 min Summer	5.807	424
960 min Summer	4.586	540
1440 min Summer	3.288	754
2160 min Summer	2.357	1104
2880 min Summer	1.862	1468
4320 min Summer	1.424	2168
5760 min Summer	1.178	2880

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	6.018	0.018	0.1	0.0	O K
8640 min Summer	6.016	0.016	0.1	0.0	O K
10080 min Summer	6.014	0.014	0.1	0.0	O K
15 min Winter	6.445	0.445	0.3	1.2	O K
30 min Winter	6.520	0.520	0.3	1.5	O K
60 min Winter	6.565	0.565	0.3	1.6	O K
120 min Winter	6.566	0.566	0.3	1.6	O K
180 min Winter	6.539	0.539	0.3	1.5	O K
240 min Winter	6.500	0.500	0.3	1.4	O K
360 min Winter	6.410	0.410	0.3	1.1	O K
480 min Winter	6.319	0.319	0.3	0.9	O K
600 min Winter	6.235	0.235	0.3	0.7	O K
720 min Winter	6.163	0.163	0.3	0.5	O K
960 min Winter	6.051	0.051	0.3	0.1	O K
1440 min Winter	6.036	0.036	0.2	0.1	O K
2160 min Winter	6.026	0.026	0.1	0.1	O K
2880 min Winter	6.021	0.021	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3592
8640 min Summer	0.901	4368
10080 min Summer	0.814	5136
15 min Winter	72.885	21
30 min Winter	46.335	35
60 min Winter	29.457	62
120 min Winter	18.727	96
180 min Winter	14.368	136
240 min Winter	11.905	172
360 min Winter	9.134	244
480 min Winter	7.568	310
600 min Winter	6.541	372
720 min Winter	5.807	428
960 min Winter	4.586	498
1440 min Winter	3.288	738
2160 min Winter	2.357	1100
2880 min Winter	1.862	1460

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	6.016	0.016	0.1	0.0	O K
5760 min Winter	6.013	0.013	0.1	0.0	O K
7200 min Winter	6.011	0.011	0.1	0.0	O K
8640 min Winter	6.010	0.010	0.1	0.0	O K
10080 min Winter	6.009	0.009	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2128
5760 min Winter	1.178	2984
7200 min Winter	1.016	3560
8640 min Winter	0.901	4400
10080 min Winter	0.814	5120

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.008

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.008

Model Details

Storage is Online Cover Level (m) 6.940

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	6.000	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 151 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15 min Summer	7.084	1.084	0.3	3.0	O K
30 min Summer	7.265	1.265	0.3	3.5	O K
60 min Summer	7.425	1.425	0.3	4.0	O K
120 min Summer	7.501	1.501	0.3	4.2	O K
180 min Summer	7.485	1.485	0.3	4.2	O K
240 min Summer	7.462	1.462	0.3	4.1	O K
360 min Summer	7.414	1.414	0.3	4.0	O K
480 min Summer	7.356	1.356	0.3	3.8	O K
600 min Summer	7.291	1.291	0.3	3.6	O K
720 min Summer	7.223	1.223	0.3	3.4	O K
960 min Summer	6.979	0.979	0.3	2.7	O K
1440 min Summer	6.586	0.586	0.3	1.6	O K
2160 min Summer	6.215	0.215	0.3	0.6	O K
2880 min Summer	6.060	0.060	0.3	0.2	O K
4320 min Summer	6.039	0.039	0.2	0.1	O K
5760 min Summer	6.032	0.032	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	163.966	22
30 min Summer	99.917	37
60 min Summer	60.886	66
120 min Summer	37.102	124
180 min Summer	27.769	158
240 min Summer	22.609	190
360 min Summer	16.922	256
480 min Summer	13.777	326
600 min Summer	11.747	394
720 min Summer	10.312	462
960 min Summer	8.002	592
1440 min Summer	5.597	840
2160 min Summer	3.915	1172
2880 min Summer	3.038	1476
4320 min Summer	2.267	2204
5760 min Summer	1.842	2872

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	6.027	0.027	0.1	0.1	O K
8640 min Summer	6.024	0.024	0.1	0.1	O K
10080 min Summer	6.021	0.021	0.1	0.1	O K
15 min Winter	7.086	1.086	0.3	3.0	O K
30 min Winter	7.270	1.270	0.3	3.6	O K
60 min Winter	7.434	1.434	0.3	4.0	O K
120 min Winter	7.521	1.521	0.3	4.3	O K
180 min Winter	7.498	1.498	0.3	4.2	O K
240 min Winter	7.459	1.459	0.3	4.1	O K
360 min Winter	7.375	1.375	0.3	3.8	O K
480 min Winter	7.270	1.270	0.3	3.6	O K
600 min Winter	7.156	1.156	0.3	3.2	O K
720 min Winter	7.040	1.040	0.3	2.9	O K
960 min Winter	6.705	0.705	0.3	2.0	O K
1440 min Winter	6.224	0.224	0.3	0.6	O K
2160 min Winter	6.043	0.043	0.2	0.1	O K
2880 min Winter	6.034	0.034	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3648
8640 min Summer	1.375	4320
10080 min Summer	1.230	5040
15 min Winter	163.966	22
30 min Winter	99.917	36
60 min Winter	60.886	64
120 min Winter	37.102	120
180 min Winter	27.769	172
240 min Winter	22.609	194
360 min Winter	16.922	272
480 min Winter	13.777	348
600 min Winter	11.747	420
720 min Winter	10.312	492
960 min Winter	8.002	620
1440 min Winter	5.597	840
2160 min Winter	3.915	1108
2880 min Winter	3.038	1436

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	6.025	0.025	0.1	0.1	O K
5760 min Winter	6.021	0.021	0.1	0.1	O K
7200 min Winter	6.018	0.018	0.1	0.0	O K
8640 min Winter	6.015	0.015	0.1	0.0	O K
10080 min Winter	6.014	0.014	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2168
5760 min Winter	1.842	2896
7200 min Winter	1.568	3592
8640 min Winter	1.375	4328
10080 min Winter	1.230	5136

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.008

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.008

Model Details

Storage is Online Cover Level (m) 7.800

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	6.000	Cap Infiltration Depth (m)	0.000

Summary of Results for 10 year Return Period (+45%)

Half Drain Time : 64 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.772	0.472	0.4	1.9	O K
30 min Summer	5.852	0.552	0.4	2.2	O K
60 min Summer	5.903	0.603	0.4	2.4	O K
120 min Summer	5.923	0.623	0.4	2.5	O K
180 min Summer	5.919	0.619	0.4	2.5	O K
240 min Summer	5.904	0.604	0.4	2.4	O K
360 min Summer	5.861	0.561	0.4	2.2	O K
480 min Summer	5.810	0.510	0.4	2.0	O K
600 min Summer	5.756	0.456	0.4	1.8	O K
720 min Summer	5.703	0.403	0.4	1.6	O K
960 min Summer	5.561	0.261	0.4	1.0	O K
1440 min Summer	5.392	0.092	0.4	0.4	O K
2160 min Summer	5.343	0.043	0.3	0.2	O K
2880 min Summer	5.334	0.034	0.2	0.1	O K
4320 min Summer	5.326	0.026	0.2	0.1	O K
5760 min Summer	5.322	0.022	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	72.885	21
30 min Summer	46.335	35
60 min Summer	29.457	60
120 min Summer	18.727	94
180 min Summer	14.368	128
240 min Summer	11.905	164
360 min Summer	9.134	232
480 min Summer	7.568	298
600 min Summer	6.541	364
720 min Summer	5.807	428
960 min Summer	4.586	544
1440 min Summer	3.288	758
2160 min Summer	2.357	1100
2880 min Summer	1.862	1452
4320 min Summer	1.424	2208
5760 min Summer	1.178	2928

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
7200 min Summer	5.319	0.019	0.1	0.1	O K
8640 min Summer	5.317	0.017	0.1	0.1	O K
10080 min Summer	5.315	0.015	0.1	0.1	O K
15 min Winter	5.773	0.473	0.4	1.9	O K
30 min Winter	5.855	0.555	0.4	2.2	O K
60 min Winter	5.910	0.610	0.4	2.4	O K
120 min Winter	5.916	0.616	0.4	2.4	O K
180 min Winter	5.892	0.592	0.4	2.4	O K
240 min Winter	5.855	0.555	0.4	2.2	O K
360 min Winter	5.767	0.467	0.4	1.9	O K
480 min Winter	5.674	0.374	0.4	1.5	O K
600 min Winter	5.587	0.287	0.4	1.1	O K
720 min Winter	5.509	0.209	0.4	0.8	O K
960 min Winter	5.367	0.067	0.4	0.3	O K
1440 min Winter	5.338	0.038	0.3	0.2	O K
2160 min Winter	5.328	0.028	0.2	0.1	O K
2880 min Winter	5.322	0.022	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.016	3568
8640 min Summer	0.901	4392
10080 min Summer	0.814	5112
15 min Winter	72.885	21
30 min Winter	46.335	35
60 min Winter	29.457	62
120 min Winter	18.727	98
180 min Winter	14.368	136
240 min Winter	11.905	174
360 min Winter	9.134	246
480 min Winter	7.568	314
600 min Winter	6.541	376
720 min Winter	5.807	436
960 min Winter	4.586	524
1440 min Winter	3.288	740
2160 min Winter	2.357	1104
2880 min Winter	1.862	1456

Summary of Results for 10 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.317	0.017	0.1	0.1	O K
5760 min Winter	5.314	0.014	0.1	0.1	O K
7200 min Winter	5.312	0.012	0.1	0.0	O K
8640 min Winter	5.311	0.011	0.1	0.0	O K
10080 min Winter	5.310	0.010	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	1.424	2188
5760 min Winter	1.178	2952
7200 min Winter	1.016	3648
8640 min Winter	0.901	4328
10080 min Winter	0.814	5192

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	10	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.012

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.012

Model Details

Storage is Online Cover Level (m) 5.930

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	7.1
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 162 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15	min Summer	6.450	1.150	0.4	4.6	O K
30	min Summer	6.645	1.345	0.4	5.3	O K
60	min Summer	6.821	1.521	0.4	6.0	O K
120	min Summer	6.917	1.617	0.4	6.4	O K
180	min Summer	6.905	1.605	0.4	6.4	O K
240	min Summer	6.882	1.582	0.4	6.3	O K
360	min Summer	6.835	1.535	0.4	6.1	O K
480	min Summer	6.780	1.480	0.4	5.9	O K
600	min Summer	6.717	1.417	0.4	5.6	O K
720	min Summer	6.650	1.350	0.4	5.4	O K
960	min Summer	6.397	1.097	0.4	4.4	O K
1440	min Summer	5.987	0.687	0.4	2.7	O K
2160	min Summer	5.579	0.279	0.4	1.1	O K
2880	min Summer	5.381	0.081	0.4	0.3	O K
4320	min Summer	5.341	0.041	0.3	0.2	O K
5760	min Summer	5.333	0.033	0.2	0.1	O K

	Storm Event	Rain (mm/hr)	Time-Peak (mins)
15	min Summer	163.966	22
30	min Summer	99.917	37
60	min Summer	60.886	66
120	min Summer	37.102	124
180	min Summer	27.769	162
240	min Summer	22.609	194
360	min Summer	16.922	260
480	min Summer	13.777	330
600	min Summer	11.747	398
720	min Summer	10.312	466
960	min Summer	8.002	598
1440	min Summer	5.597	842
2160	min Summer	3.915	1176
2880	min Summer	3.038	1500
4320	min Summer	2.267	2188
5760	min Summer	1.842	2936

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
7200 min Summer	5.329	0.029	0.2	0.1	O K
8640 min Summer	5.325	0.025	0.2	0.1	O K
10080 min Summer	5.322	0.022	0.2	0.1	O K
15 min Winter	6.451	1.151	0.4	4.6	O K
30 min Winter	6.650	1.350	0.4	5.4	O K
60 min Winter	6.831	1.531	0.4	6.1	O K
120 min Winter	6.938	1.638	0.4	6.5	O K
180 min Winter	6.925	1.625	0.4	6.5	O K
240 min Winter	6.883	1.583	0.4	6.3	O K
360 min Winter	6.804	1.504	0.4	6.0	O K
480 min Winter	6.703	1.403	0.4	5.6	O K
600 min Winter	6.591	1.291	0.4	5.1	O K
720 min Winter	6.475	1.175	0.4	4.7	O K
960 min Winter	6.128	0.828	0.4	3.3	O K
1440 min Winter	5.608	0.308	0.4	1.2	O K
2160 min Winter	5.346	0.046	0.3	0.2	O K
2880 min Winter	5.336	0.036	0.3	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
7200 min Summer	1.568	3576
8640 min Summer	1.375	4296
10080 min Summer	1.230	4968
15 min Winter	163.966	22
30 min Winter	99.917	36
60 min Winter	60.886	64
120 min Winter	37.102	122
180 min Winter	27.769	174
240 min Winter	22.609	198
360 min Winter	16.922	274
480 min Winter	13.777	352
600 min Winter	11.747	426
720 min Winter	10.312	496
960 min Winter	8.002	630
1440 min Winter	5.597	856
2160 min Winter	3.915	1084
2880 min Winter	3.038	1468

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
4320 min Winter	5.327	0.027	0.2	0.1	O K
5760 min Winter	5.322	0.022	0.2	0.1	O K
7200 min Winter	5.319	0.019	0.1	0.1	O K
8640 min Winter	5.316	0.016	0.1	0.1	O K
10080 min Winter	5.315	0.015	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
4320 min Winter	2.267	2148
5760 min Winter	1.842	2840
7200 min Winter	1.568	3616
8640 min Winter	1.375	4288
10080 min Winter	1.230	5136

Rainfall Details

Rainfall Model	FEH	F (1km)	2.316
Return Period (years)	100	Summer Storms	Yes
Site Location	GB 552114 103217	Winter Storms	Yes
C (1km)	-0.026	Cv (Summer)	1.000
D1 (1km)	0.405	Cv (Winter)	1.000
D2 (1km)	0.238	Shortest Storm (mins)	15
D3 (1km)	0.398	Longest Storm (mins)	10080
E (1km)	0.309	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.012

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.012

Model Details

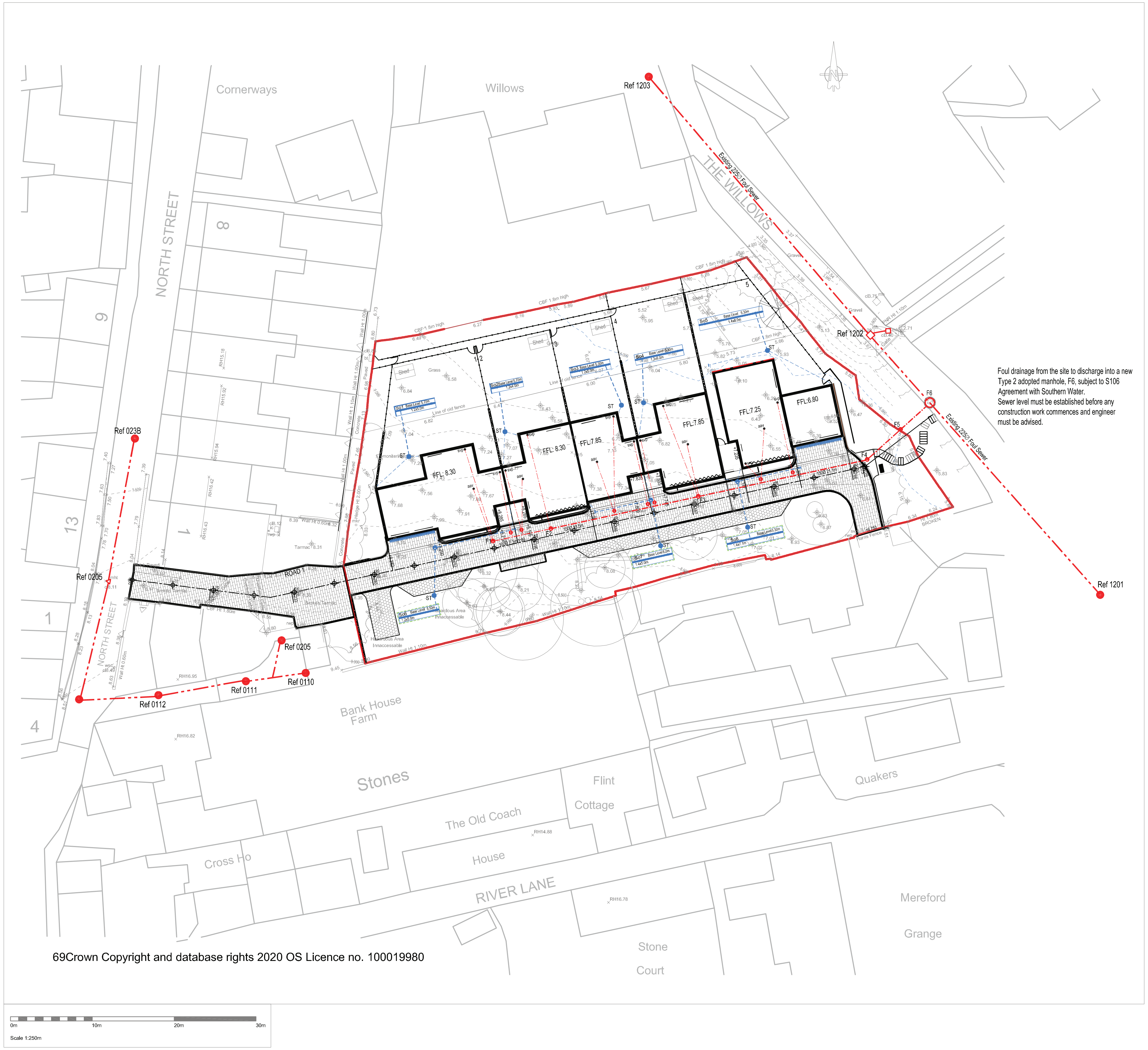
Storage is Online Cover Level (m) 7.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.26172	Trench Width (m)	1.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	7.1
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.40	Cap Volume Depth (m)	0.000
Invert Level (m)	5.300	Cap Infiltration Depth (m)	0.000

Appendix K

Drainage Strategy and Site Section



DRAINAGE STRATEGY

SURFACE WATER DRAINAGE:

Surface water drainage embraces the SuDS (Sustainable Drainage System) philosophy. On site tests at various locations and levels have been undertaken to establish suitability of utilising infiltration methods as the means of surface water disposal. These tests results have been utilised to produce a drainage strategy that will introduce soakaways to cater for the discharge from roofs. Drives and carriageway areas will be constructed in permeble paving which will drain into free draining granular sub base. Prior to discharging to a soakaway surface water discharge will pass through a silt trap which will reduce the sediment deposit in the soakaway.

All surface water drainage has been designed in accordance with current Environment Agency requirements for the 1 in 100 year storm event plus 45% increase for climate change and the appropriate factor of safety.

FOUL WATER DRAINAGE:

The nearest public foul sewer to enable a gravity discharge fom the site is situated to the East in The Willows. Southern Water criteria regarding connecting to public sewers means there will be no objection to the proposed discharge from the site connecting into this sewer. Connection to the sewer will involve the construction of a new manhole which will be subject to a Section 106 Agreement between the developer and Soutern Water.

Legend:

Symbol	Description
Ref 1201	Existing foul water sewer
	Type 2 manhole
S4	Domestic surface water drain.
F4	Domestic foul water gravity sewer (with backdrop connection)
	Type 3 manhole - 450Ø
	Type 4 shallow PPIC inspection chamber - 250Ø
ST	Silt trap inspection chamber - 450Ø
	ACO drainage channel installed at entrance to all garages
Underbuild	Areas requiring underbuild brickwork
So2 4.0x11.0 1.0m deep	Soakaway designed in accordance with Environment Agency criteria to cater for 1 in 10yr storm return and catering for 10% increase for 'urban creep'. No flooding to occour for 1 in 100yr storm with 45% allowance for climate change. Sizing determined by in-situ testing in accordance with BRE365, depth of soakaway above observed winter groundwater monitoring levels and sited a minimum of 5.0 metres from new dwellings.
So2 4.0x11.0 1.0m deep	Soakaway wrapped with tree root protection membrane in accordance with arborculturist consultant details and specifications.
	Porous block paved access court construction
	Parking bays in reinforced grass construction in accordance with arboriculturist consultant details and specifications.
FFL: 8.30	Proposed Finished Floor Level
	Retaining wall

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION
CDM Regulations 2015

In addition to the hazards/risks normally associated with the type of work detailed on this drawing note should be made of the following:

- Working in vicinity of live highway
- Services to be located prior to any excavation work being undertaken
- Working on live foul sewers
- Deep excavations

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement. Contractor is not relieved of any of his obligations under all applicable health and safety regulations.

Rev.	Date	Details	Initials
A	22.08.22	First issue	KN

Drawing Status
PRELIMINARY FOR PLANNING

Project
FORMER ALLOTMENTS, NORTH STREET
ALFRISTON, POLEGATE

Client
DOMUSEA DEVELOPMENTS

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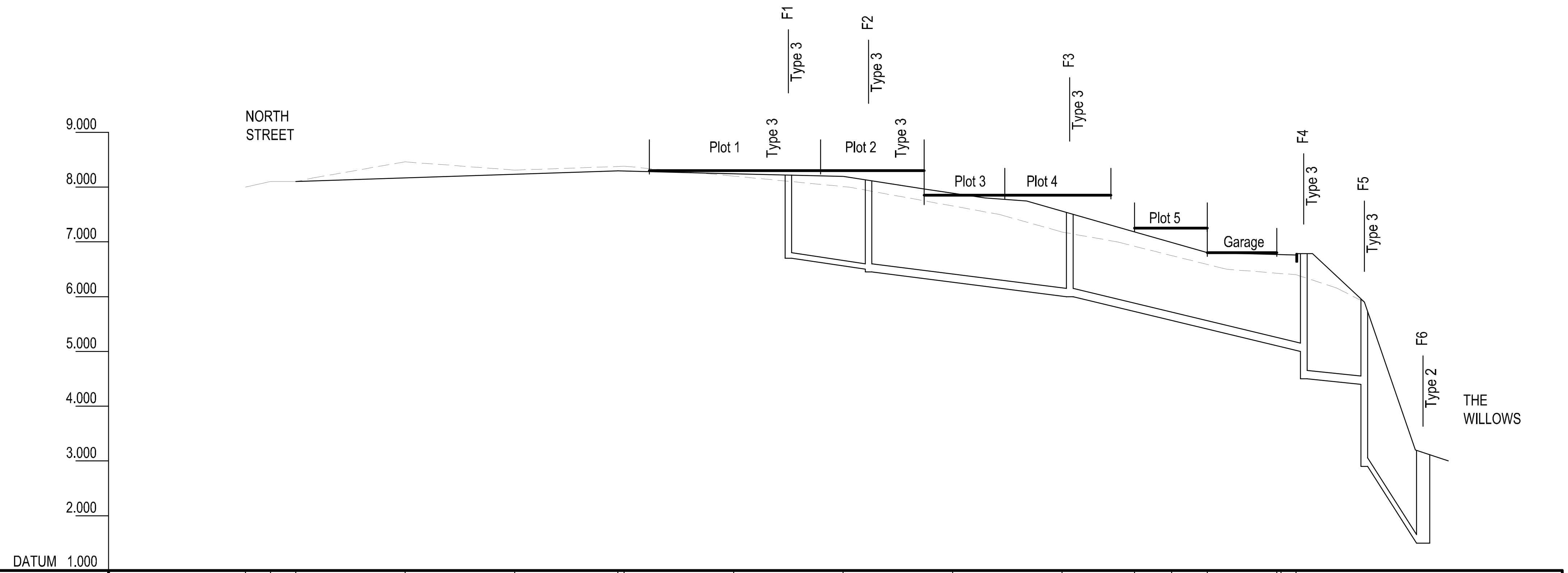
Drawing Title
Engineering Details
Drainage Strategy

Drawn	Checked	Scales	Paper Size	Date
KN		1:250	A1	05.24

Job No.	Drawing No.	Revision
KNC2404	602-01	A



CHAINAGE	0.000, 10.000, 20.000, 29.416, 30.000, 40.000, 50.000, 60.000, 70.000, 80.000, 89.620, 90.000, 91.375
EXISTING GROUND LEVEL	8.00, 8.10, 8.10, 8.17, 8.46, 8.31, 8.38, 8.20, 8.00, 7.50, 7.18, 7.00, 6.50, 6.40, 6.16, 6.00, 5.80, 3.20, 3.00
ALIGNMENT LEVEL	Existing, 8.167, 8.233, 8.296, 8.282, 8.250, 8.243, 8.195, 7.960, 7.886, 7.800, 7.745, 7.557, 7.177, 6.985, 6.800, 6.768, 6.766, 6.759
ALIGNMENT	G=0.667% 1: 150 L=29.416m; G=-0.5% 1: 200 L=20.584m; G=-3.05% 1: 32.7 L=12.933m; G= -1.44% 1: 69 L=3.8m; G=-5.76% 1: 17.5 L=16.433m; G=-0.5% 1: 200 L=6.36m
FOUL SEWER	6.700; 100mm ESVC Bed S L=7.3m 1/36.5; 6.500; 6.450; 150mm ESVC Bed S L=18.5m 1/41.1; 6.000; 150mm ESVC Bed S L=21.1m 1/21.1; 5.000; 4.500; 150mm ESVC L=5.5m 1/55; 4.400; 2.900; 150mm ESVC L=5.5m 1/4; 1.500 TBC

ROAD 1

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Project
NORTH STREET, ALFRISTON
Drawing Title
Engineering Details
Longitudinal Sections

Drawing Status
Preliminary for Planning
Client

DOMUSEA DEVELOPMENTS

Rev.	Date	Details	Initials
A	25.05.24	First Issue	KN

Scales H1:500 V1:100
Paper Size A3
Job No. KNC2404
Drawing No. 503-01
Rev A