

Appendix G EA Flood Mapping and Product 4



- NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
 3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE SHOWN.
 4. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS. DRAWING BASED ON TOPOGRAPHICAL SURVEY PROVIDED BY OTHERS; C&A ARE NOT RESPONSIBLE FOR ANY INACCURACIES.

KEY

- Site Boundary
- Flood zone 2 (5.17m)
- Flood zone 3 (1.87m)

Rev	Amendments	Dm	Chk	App	Date



Charles & Associates

☒ Issued by

☐ Park House
Park Farm
East Malling Trust Estate
Bradbourne Lane
Aylesford
Kent
ME20 6SN
01752 638420
www.c-a-uk.com

Job Title

Land East of Woodgate Lane

Drawing Title

EA Floodzone Data

Client

Pye Homes

Scale	1:500@A1	Date	April 21	Designed	SC
Drawn	SC	Checked	SAC	Approved	GAC

Job No	20-061	Drawing No	20-061-024	Rev	-
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Robert Attwood
Charles & Associates

Our ref: SSD197908
Date: 22/12/2020

Dear Robert Attwood,

Enquiry Regarding Product 4 for Flood Risk Assessment for Land East of Woodgate Road, Woodgate, PO20 3SU.

Thank you for your enquiry which was received on 27th November 2020.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

The site is in an area located within Flood Zone 1, 2 & 3 as shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself as it is influenced by factors such as the height of door steps, air bricks or the height of surrounding walls. We do not have access to this information and is not currently used in our flood modelling.

Flood Defences

There are no formal raised flood defences in the vicinity of the site.

Model Information

Fluvial: Aldingbourne Flood Risk Mapping Study, completed in 2015 by JBA Consulting (Defended Only), plus climate change allowances (2016). Tidal: River Arun to East Head, completed in 2016 by JBA Consulting.

Flood History

We hold no record of previous flooding events affecting this site.

Please note our records are not comprehensive and may not include all events. I recommend contacting the Lead Local Flood Authority, **West Sussex County Council** or the Local Authority, **Arun District Council** for a more comprehensive flood history check.

FRA advisory text

Name	Product 4
Description	Detailed Flood Risk Assessment Map for Land East of Woodgate Road, Woodgate, PO20 3SU.
Licence	<u>Open Government Licence</u>
Information Warnings	The flood risk data provided is based on existing EA hydraulic models for existing 0.5% annual probability events with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 17 December 2019. You should refer to ' <u>Flood risk assessments: climate change allowances</u> ' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2020 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning (Flood Zone 2, Flood Zone 3, Flood Storage Areas, Flood Defences, Areas Benefiting from Defences)
- Risk of Flooding from Rivers and Sea
- Historic Flood Map
- Current Flood Warnings

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

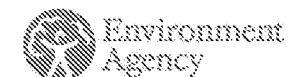
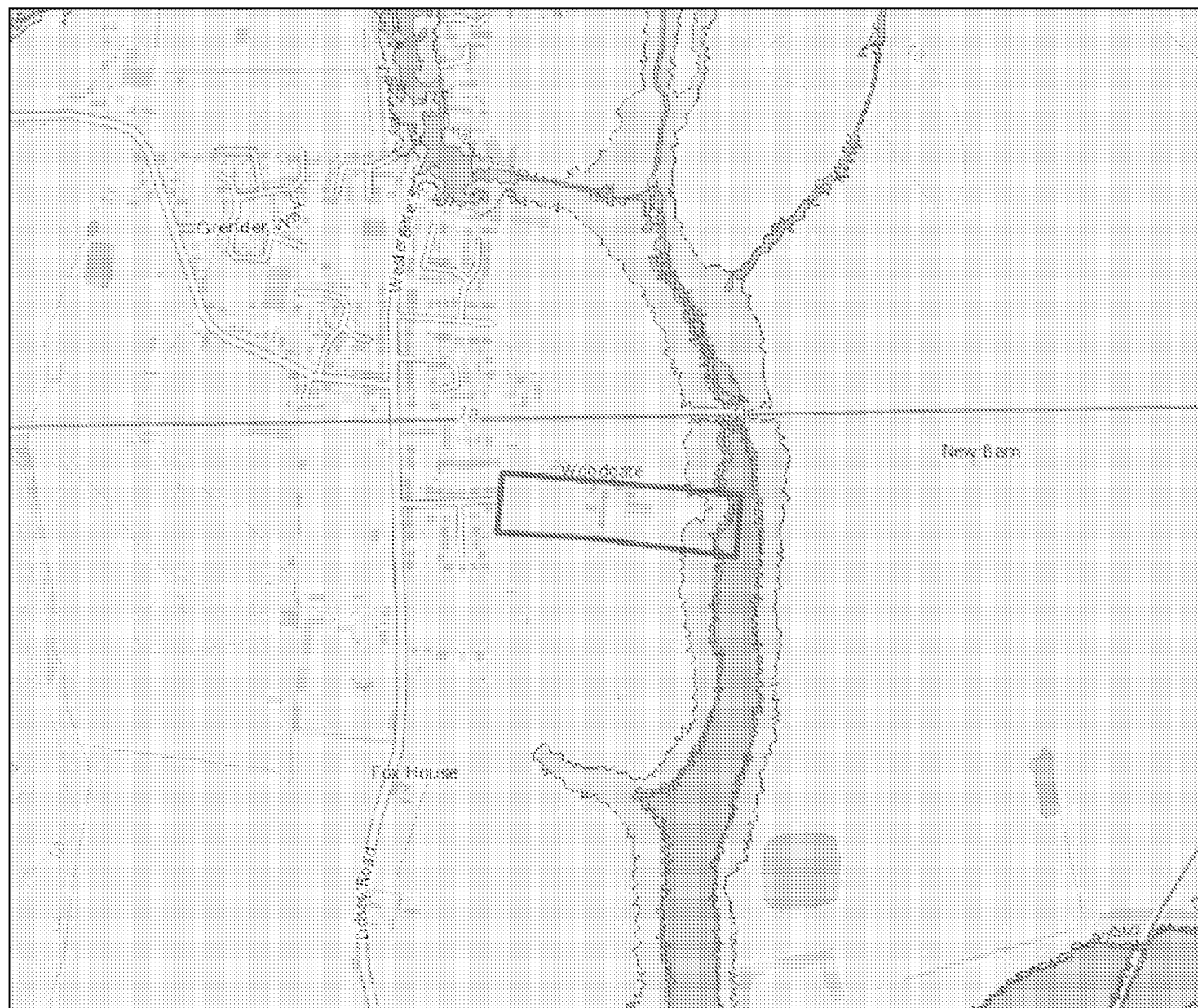
Yours sincerely,

Tom Lamboo

FCRM Officer, Partnership & Strategic Overview West Sussex, Solent and South Downs

Environment Agency, Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD

Flood Map for Planning (Rivers and Sea). Centred PO20 3SU. Created 22/12/2020.



1: 10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

-  Defences
-  Flood Storage Areas
-  Areas benefiting from flood defences
-  Flood Zone 3
-  Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Use of Environment Agency Information for Flood Risk Assessments

Important

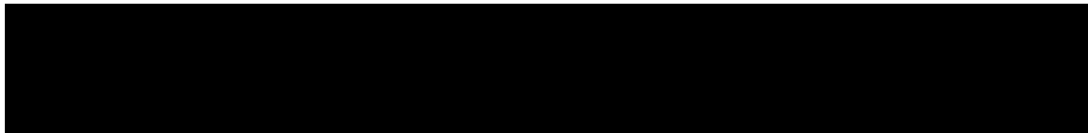
The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:



We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:



You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.



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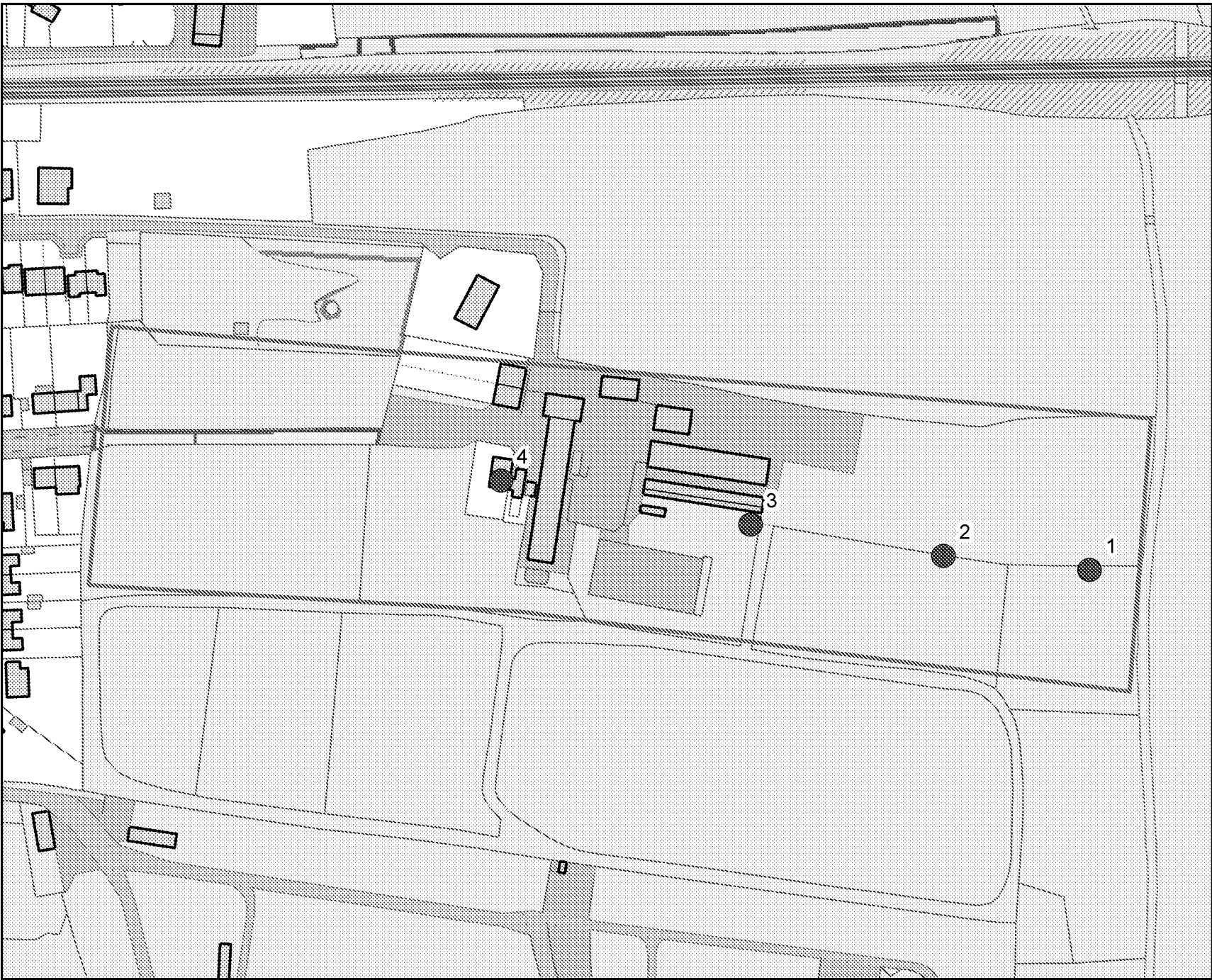

Legend

-  Site_Nodes
-  Site_Boundary

Scale: 1:2,000



00.0450.09
Kilometers



Product 4 Flood Risk Data Requested by: Charles & Associates

Site: Land East of Woodgate Road, Woodgate, PO20 3SU

Table 1: Water Levels: Fluvial Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD					
			Undefended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	494333	104145	-	-	3.06	3.65	6.06	-
2	494278	104150	-	-	-	-	6.06	-
3	494206	104162	-	-	-	-	-	-
4	494113	104178	-	-	-	-	-	-

Table 2: Water Levels: Fluvial Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD					
			Defended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	494333	104145	-	1.87	2.24	2.24	6.01	5.17
2	494278	104150	-	-	-	-	6.03	5.20
3	494206	104162	-	-	-	-	-	-
4	494113	104178	-	-	-	-	-	-

Table 3: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
			Undefended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	494333	104145	1.95	2.60	3.45	2.11
2	494278	104150	-	-	-	-
3	494206	104162	-	-	-	-
4	494113	104178	-	-	-	-

Table 4: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
			Defended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	494333	104145	-	-	-	-
2	494278	104150	-	-	-	-
3	494206	104162	-	-	-	-
4	494113	104178	-	-	-	-

Table 5: Water Depths: Fluvial Undefended

Node Ref	NGR		Modelled Flood Depths in Metres					
			Undefended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	494333	104145	-	-	1.07	1.66	4.06	-
2	494278	104150	-	-	-	-	1.29	-
3	494206	104162	-	-	-	-	-	-
4	494113	104178	-	-	-	-	-	-

Table 6: Water Depths: Fluvial Defended

Node Ref	NGR		Modelled Flood Depths in Metres					
			Defended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	494333	104145	-	0.16	0.40	0.40	4.19	3.46
2	494278	104150	-	-	-	-	1.29	0.66
3	494206	104162	-	-	-	-	-	-
4	494113	104178	-	-	-	-	-	-

Table 7: Water Depths: Tidal Undefended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Undefended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	494333	104145	0.20	0.85	1.69	0.35
2	494278	104150	-	-	-	-
3	494206	104162	-	-	-	-
4	494113	104178	-	-	-	-

Table 8: Water Depths: Tidal Defended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Defended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	494333	104145	-	-	-	-
2	494278	104150	-	-	-	-
3	494206	104162	-	-	-	-
4	494113	104178	-	-	-	-

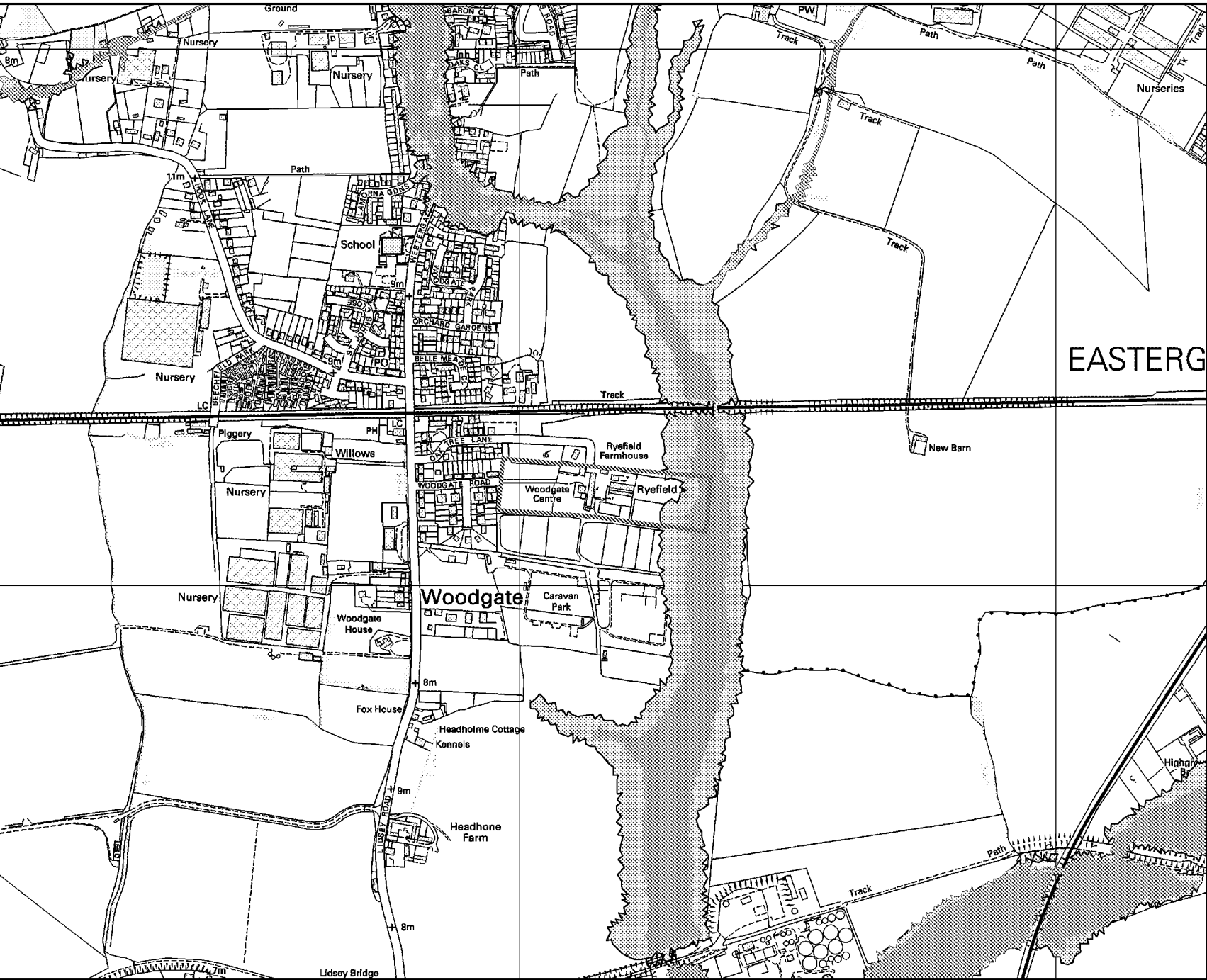
All levels taken from:

Fluvial: Aldingbourne Flood Risk Mapping Study, completed in 2015 by JBA Consulting (Defended Only), plus climate change allowances (2016). Tidal: River Arun to East Head, completed in 2016 by JBA Consulting.

Produced on: 22/12/2020

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

Modelled Flood Outlines- Climate Change Allowances (Defended Fluvial).
Centred PO20 3SU. Created 22/12/2020.



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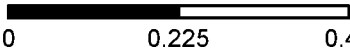
N

Legend

-  Site_Boundary
-  1% AEP +35% (Defended Fluvial)
-  1% AEP +45% (Defended Fluvial)
-  1% AEP +105% (Defended Fluvial)

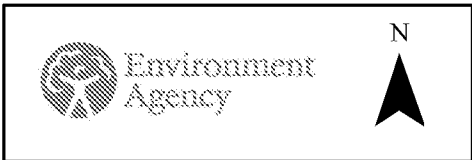
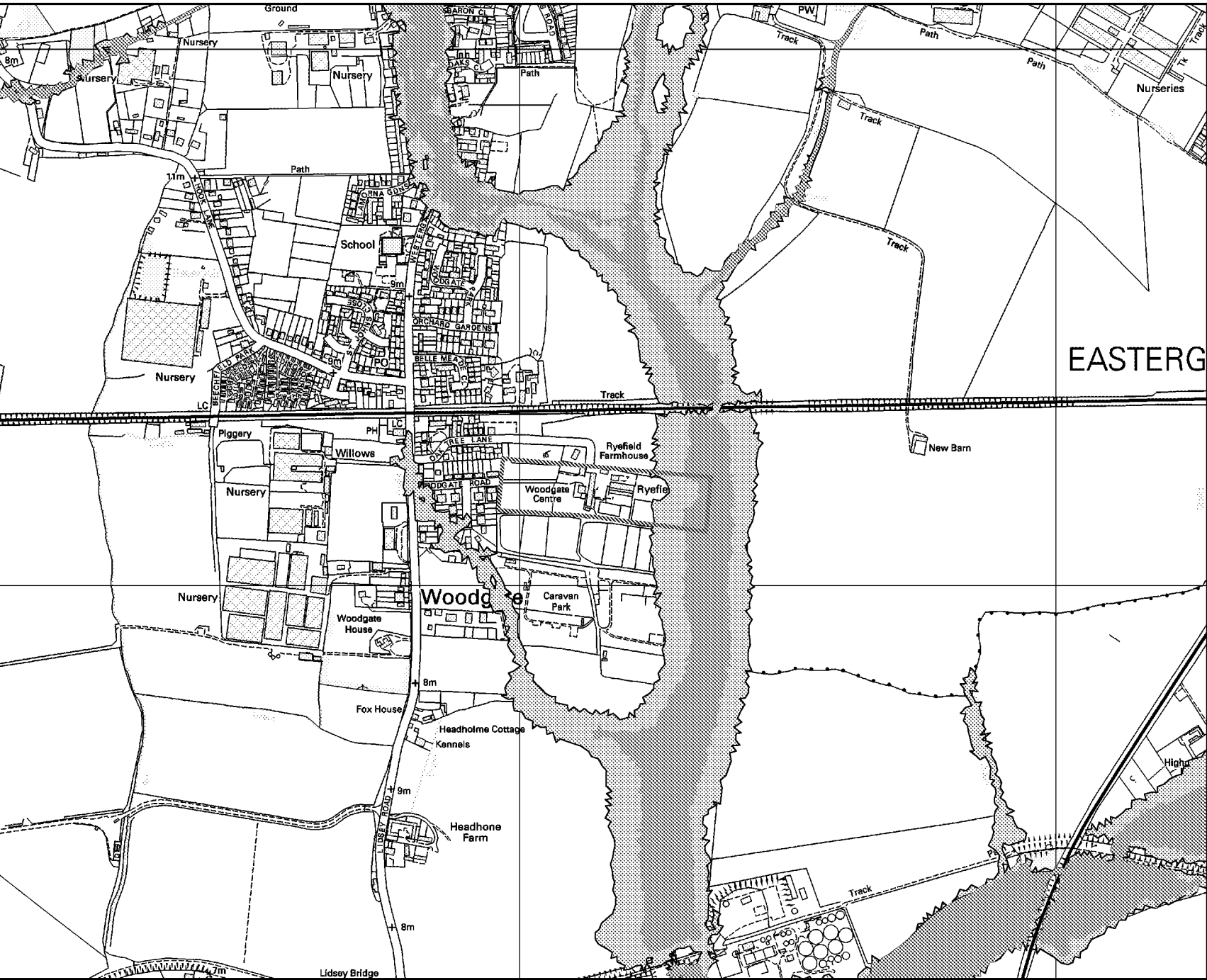
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



0 0.225 0.45
Kilometers

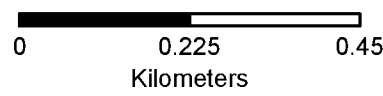
Modelled Flood Outlines- Climate Change Allowances (Undefended Fluvial).
Centred PO20 3SU. Created 22/12/2020.

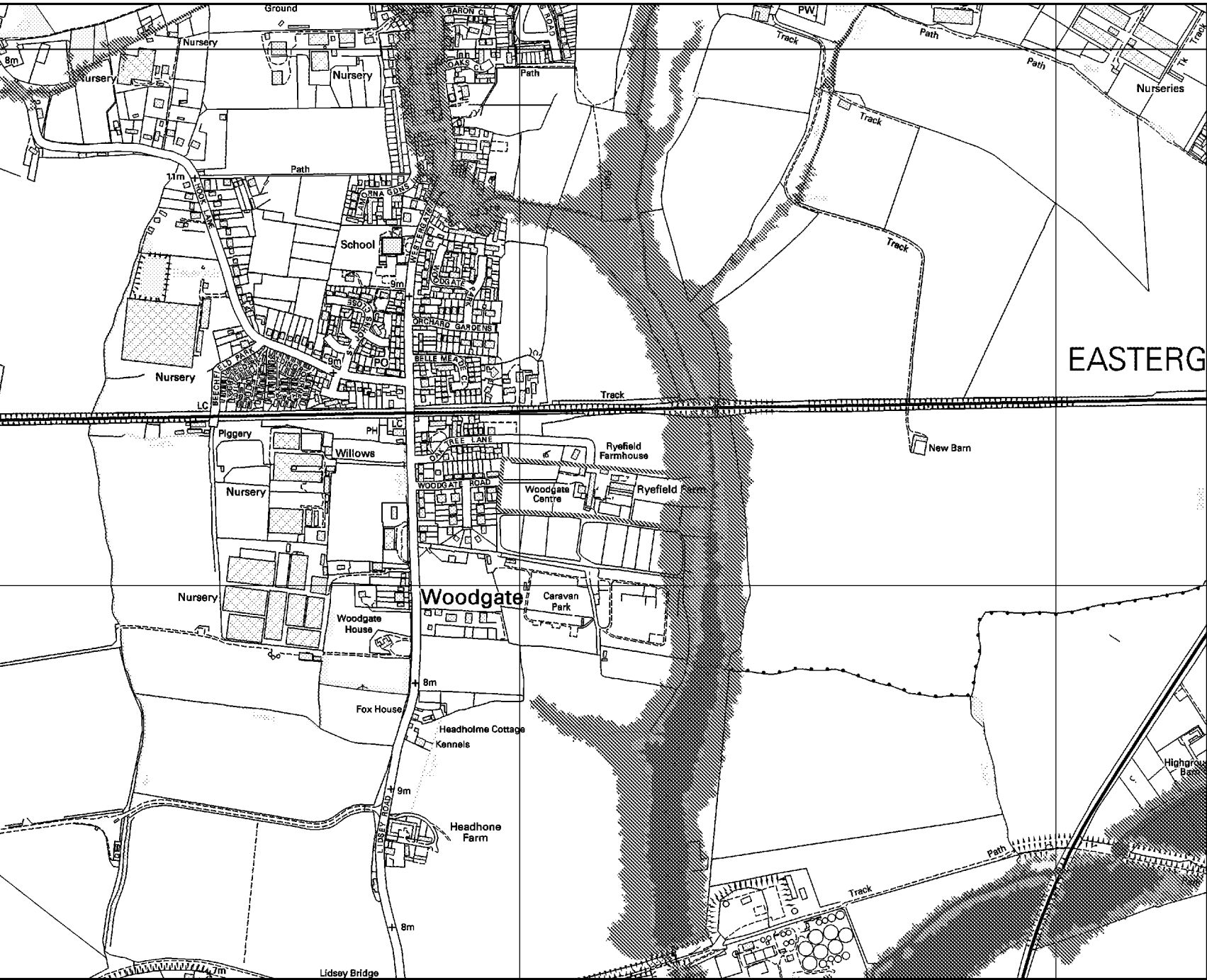


- Legend**
- Site_Boundary
 - 1% AEP +35% (Undefended Fluvial)
 - 1% AEP +45% (Undefended Fluvial)
 - 1% AEP +105% (Undefended Fluvial)

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

Scale: 1:10,000







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▲

Legend



Site_Boundary



5% AEP (Defended Fluvial)



1% AEP (Defended Fluvial)



0.1% AEP (Defended 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





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N

Legend

-  Site_Boundary
-  0.5% AEP (Defended Tidal)
-  0.5% AEP (2070) NPPF (Defended Tidal)
-  0.5% AEP (2115) NPPF (Defended Tidal)
-  0.1% AEP (Defended Tidal)

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

Scale: 1:10,000

00.2250.45

Kilometers

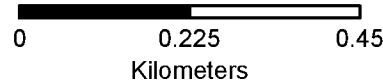


Legend

- 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







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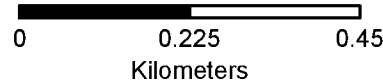


N

- Legend**
-  Site_Boundary
 -  0.5% AEP (Un defended Tidal)
 -  0.5% AEP (2070) NPPF (Un defended Tidal)
 -  0.5% AEP (2115) NPPF (Un defended Tidal)
 -  0.1% AEP (Un defended Tidal)

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

Scale: 1:10,000



Risk of flooding from Surface Water. Centred PO20 3SU. Created 22/12/2020.



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low
- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

Likelihood of flooding from Surface Water

- High:** Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium:** Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low:** Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low:** Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). E-mail: enquires@environment-agency.gov.uk

Pre-application Advice Note

September 2019

Final Flood Risk

Groundwater Quality

Source Protection Zones

We have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used across the country for public drinking water supply. These zones are more sensitive to contamination from activities that might cause pollution in the area. The closer the activity, the greater the risk.

SPZ1s are the areas designated as most at risk from contamination and development activities and in these areas we may consider it inappropriate for development to discharge foul or surface water into the ground.

To see if your proposed development is located within a Source Protection Zone, please use our online map: [\[REDACTED\]](#)

Contaminated Land

The NPPF takes a precautionary approach to land contamination. Before the principle of development can be determined, land contamination should be investigated to see whether it could preclude certain development due to environmental risk or cost of remediation. Where contamination is known or suspected, a desk study, site investigation, remediation and other works may be required to enable safe development.

Pollution

If the proposed development use has the potential to pollute ground or surface water receptors then an assessment to establish whether the risk of pollution is acceptable or can be mitigated will be required within any planning application.

Foul Drainage

When drawing up wastewater treatment proposals for any development, the first presumption is to provide a system of foul drainage discharging into a public sewer to be treated at a public sewage treatment works (those provided and operated by the water and sewerage companies). This should be done in consultation with the sewerage company of the area prior to the submission of a formal planning application.

If connection to a public sewage treatment plant is not feasible, a package sewage treatment plant may be considered. If you would like further advice please call 03708 506 506.

Cemeteries

The development of new cemeteries in areas where groundwater vulnerability is high should be avoided, except where the thickness and nature of the unsaturated zone, or the impermeable formations beneath the site, protect groundwater; or where the long-term risk is mitigated by appropriate engineering methods.

Main Rivers

Ecology

In accordance with the National Planning Policy Framework (NPPF), any development proposal should avoid significant harm to biodiversity and seek to protect and enhance it. Opportunities to incorporate biodiversity in and around the development will be encouraged.

Your scheme should be designed with a naturalised buffer zone of at least 8 metres from the main river to protect and enhance the conservation value of the watercourse and ensure access for flood defence maintenance.

This buffer zone should be managed for the benefit of biodiversity for example by the planting of locally appropriate, UK native species. The buffer zone should be undisturbed by development with no fencing, footpaths or other structures. This buffer zone will help provide more space for flood waters, provide improved habitat for local biodiversity and allows access for any maintenance requirements.

To identify any Main Rivers in proximity to your proposed development please see our Main Rivers Consultation

[\[REDACTED\]](#)

Culverting

The Environment Agency is likely to oppose culverting as it is damaging to the ecological integrity of the river channel and its corridor and acts as a barrier to the movement of wildlife, including fish and may also increase flood risk. If the proposal will impact an existing culvert the Environment Agency may oppose planning consent for development either over, or within 8 metres of an existing culvert. Wherever possible, existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Water Framework Directive (WFD)

Any marine works below MHWS require an assessment of possible impacts on Water Framework Directive (WFD) . The assessment should include all elements of the works that fall within, or have the potential to affect, a WFD water body and any of the protected areas therein (including Bathing Waters and Shellfish Waters).

The WFD assessment should follow the 'Clearing the Waters for All' guidance available at <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

Where appropriate, a WFD Assessment should assess any potential impacts and demonstrate that the required enhancements will be delivered. In some cases the requirements of a WFD assessment can be incorporated into an Environmental Impact Assessment (EIA). Any development that has the potential to cause deterioration in classification under WFD or that precludes the recommended actions from being delivered in the future is likely to be considered unacceptable to us.

Permits & Consents

Environmental Permitting Regulations

To see if your proposed development requires an Environmental Permit under the Environment Permitting Regulations please refer to our website: <https://www.gov.uk/guidance/check-if-you-need-an-environmental-permit>

From 6 April 2016 an Environmental Permit is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of designated Main River, and within 16 metres of a tidal defence.

Ordinary Watercourse Consent

The prior written consent of the relevant Lead Local Flood Authority is required for the erection of any flow control structures, culverting or diversion of ordinary watercourses, including streams, land drains and ditches.

Marine Licence

A marine licence may be required for any activities at the mean high water spring tide up to the territorial limit. This also includes the waters of every estuary, river or channel where the tide flows at mean high water spring tide.

Any development must demonstrate how adverse impacts on migratory fish, bathing waters, shellfish waters, designated sites, protected and priority species and habitats will be avoided, minimised, mitigated and if necessary compensated for. Works within or affecting a Water Framework Directive (WFD) waterbody will need to demonstrate that compliance with WFD objectives will be achieved. 'Clearing the Waters for All' provides guidance on how the impacts on WFD should be addressed, and should be used when preparing an assessment, including the screening and scoping of activities. <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

Further pre-application options

The information provided above details generic information which may or may not be applicable to your development. We are able to provide more detailed and bespoke advice and answer technical questions for a charged fee of £100 per person per hour +VAT.

If you are interested in finding out more about this service, please email:

[REDACTED]

We can explain this service and provide you with a bespoke quote for further pre-application advice that you may require please see [.gov - \[REDACTED\]](#)

Please note

Please note that the view expressed in this letter by the Environment Agency is in response to the enquiry only and does not represent our final view in relation to any future planning application made in relation to this site.

We reserve the right to change our position in relation to any such application.

As part of this preliminary response we have not technically reviewed any documents. This opinion is based on the information submitted and current planning policy and guidance.

If you have any questions please contact the Solent & South Downs Sustainable Places team:

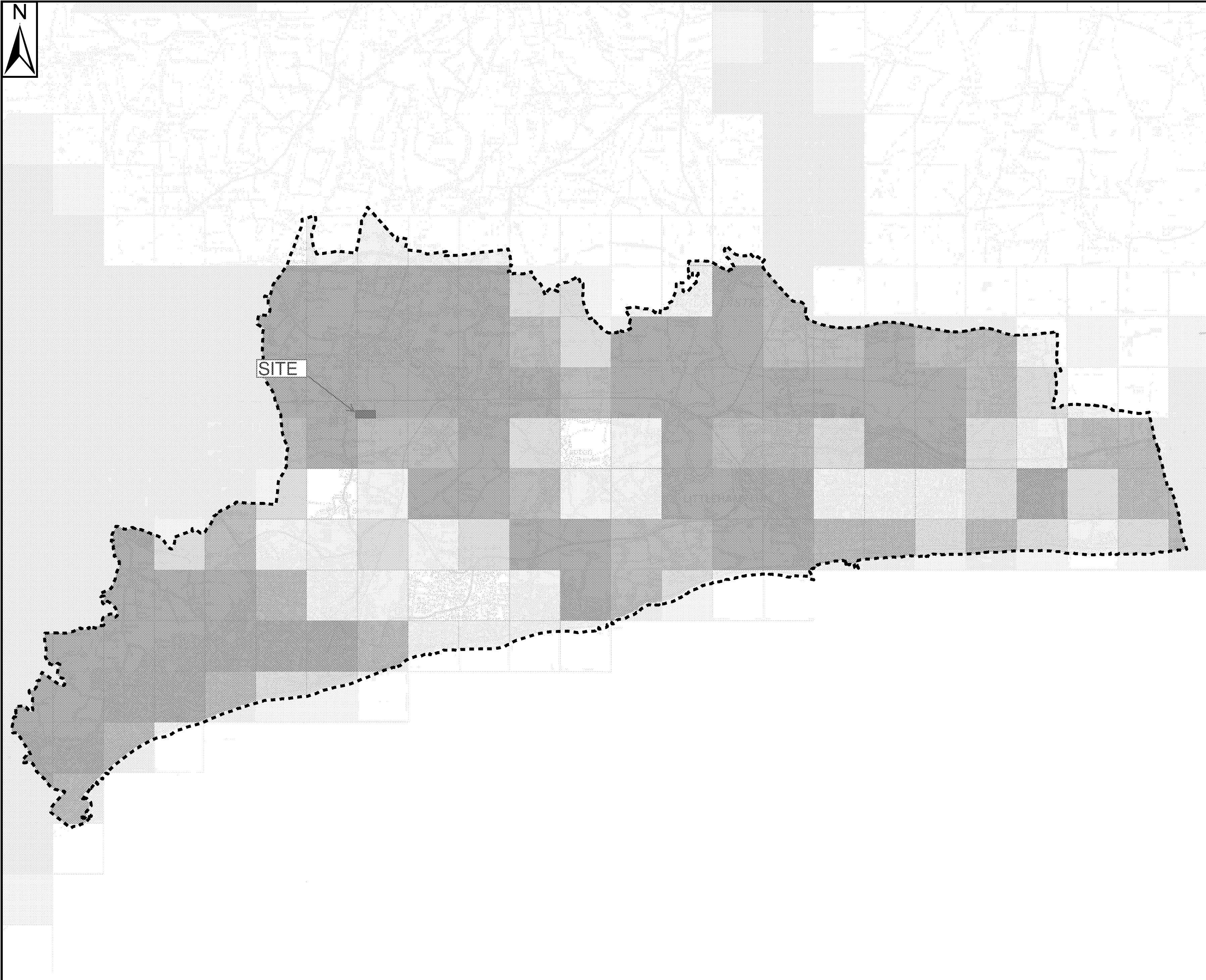
[REDACTED]

To make a request for data

Please submit your request for data to ssdenquiries@environment-agency.gov.uk. You should get the information within 20 working days. We will tell you when to expect the information if we need more time.

There are many datasets available online at www.data.gov.uk including flood maps, historic landfill, waste exemptions, consented discharges to controlled waters, and much more.

Appendix H SFRA Mapping



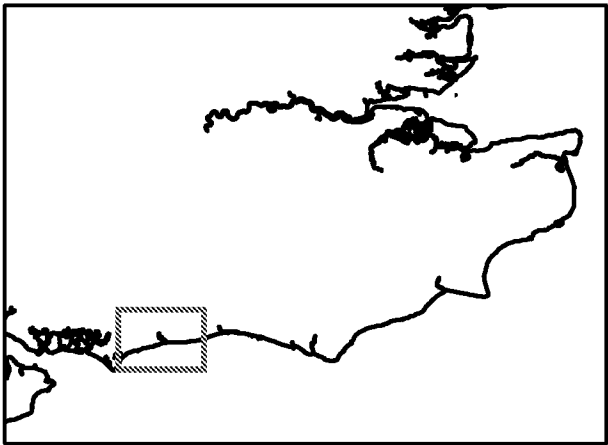
Notes

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

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

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

Key Plan



Legend

- Arun District SFRA boundary
- Areas Susceptible to Groundwater Flooding**
- Classification
- < 25%
 - >= 25% <50%
 - >= 50% <75%
 - >= 75%

REF	Date	Comments
A	June 2016	-



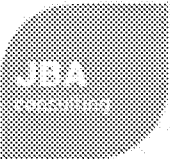
This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. 100015467

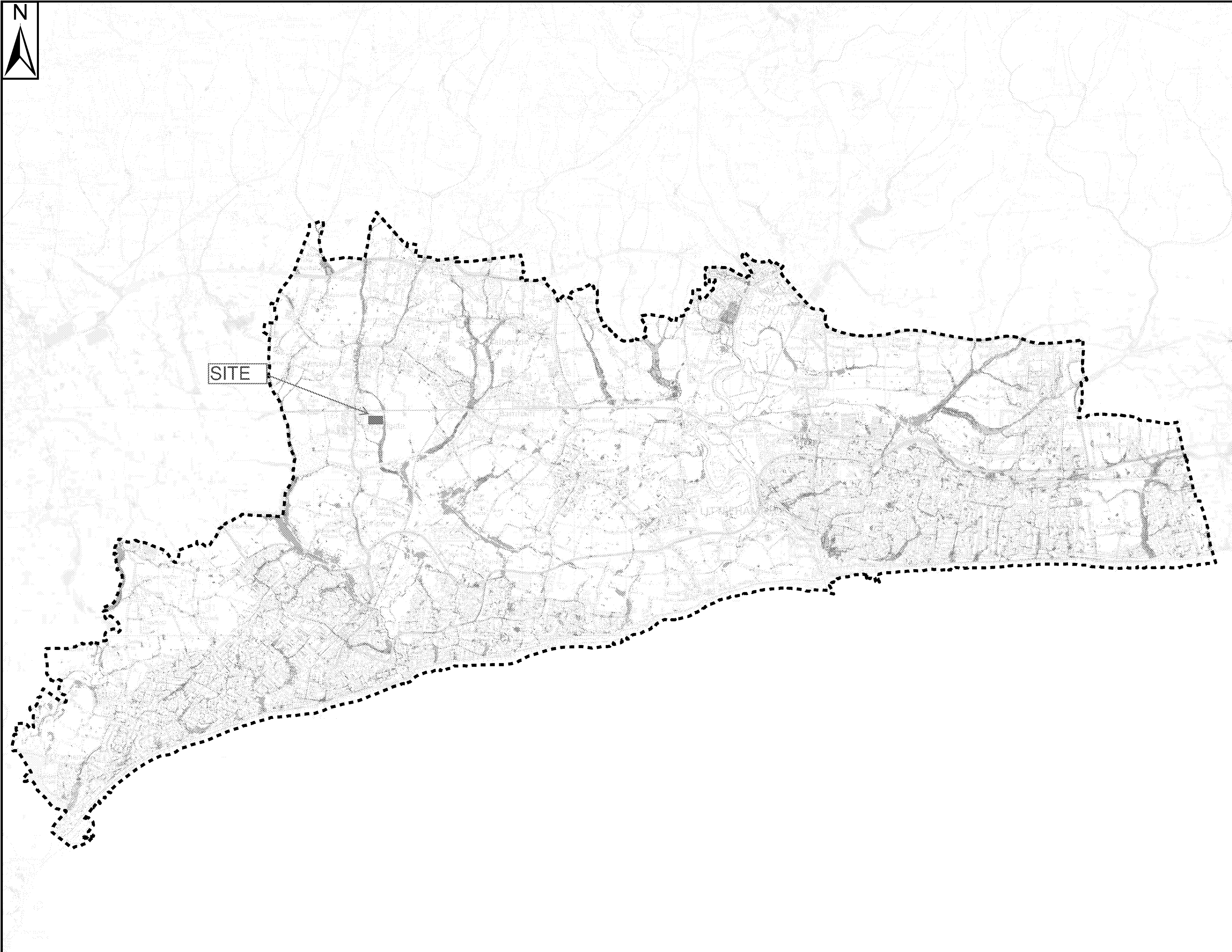
ARUN DISTRICT COUNCIL

SFRA: APPENDIX F

AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING

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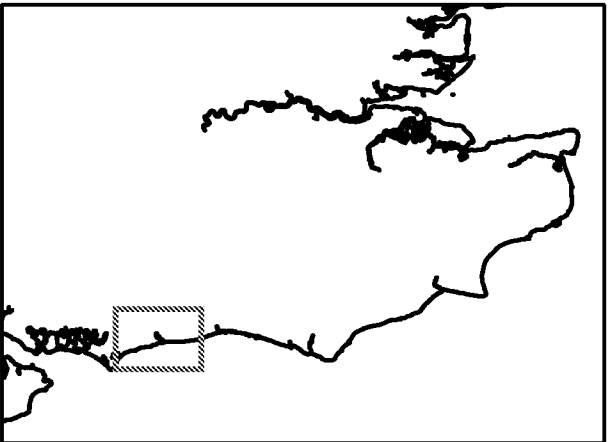
Notes

The updated Flood Map for Surface Water (uFMISW) shows the flooding that takes place from the 'surface runoff' generated by rainwater (including snow and other precipitation) which:
(a) is on the surface of the ground (whether or not it is moving), and
(b) has not yet entered a watercourse, drainage system or public sewer.

The uFMISW will pick out natural drainage channels, rivers, low areas in the floodplain and flow paths between buildings but it will only indicate flooding caused by local rainfall.

Note: The uFMISW shows predictions of flooded areas but does not show whether individual properties will be affected by surface water flooding or have been affected in the past. The uFMISW should not be used to predict if individual properties will flood.

Key Plan



Legend

- Arun District SFRA boundary
- uFMISW 30-year extent
- uFMISW 100-year extent
- uFMISW 1,000-year extent

REF	Date	Comments
A	June 2016	-

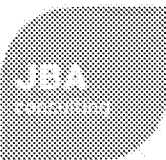


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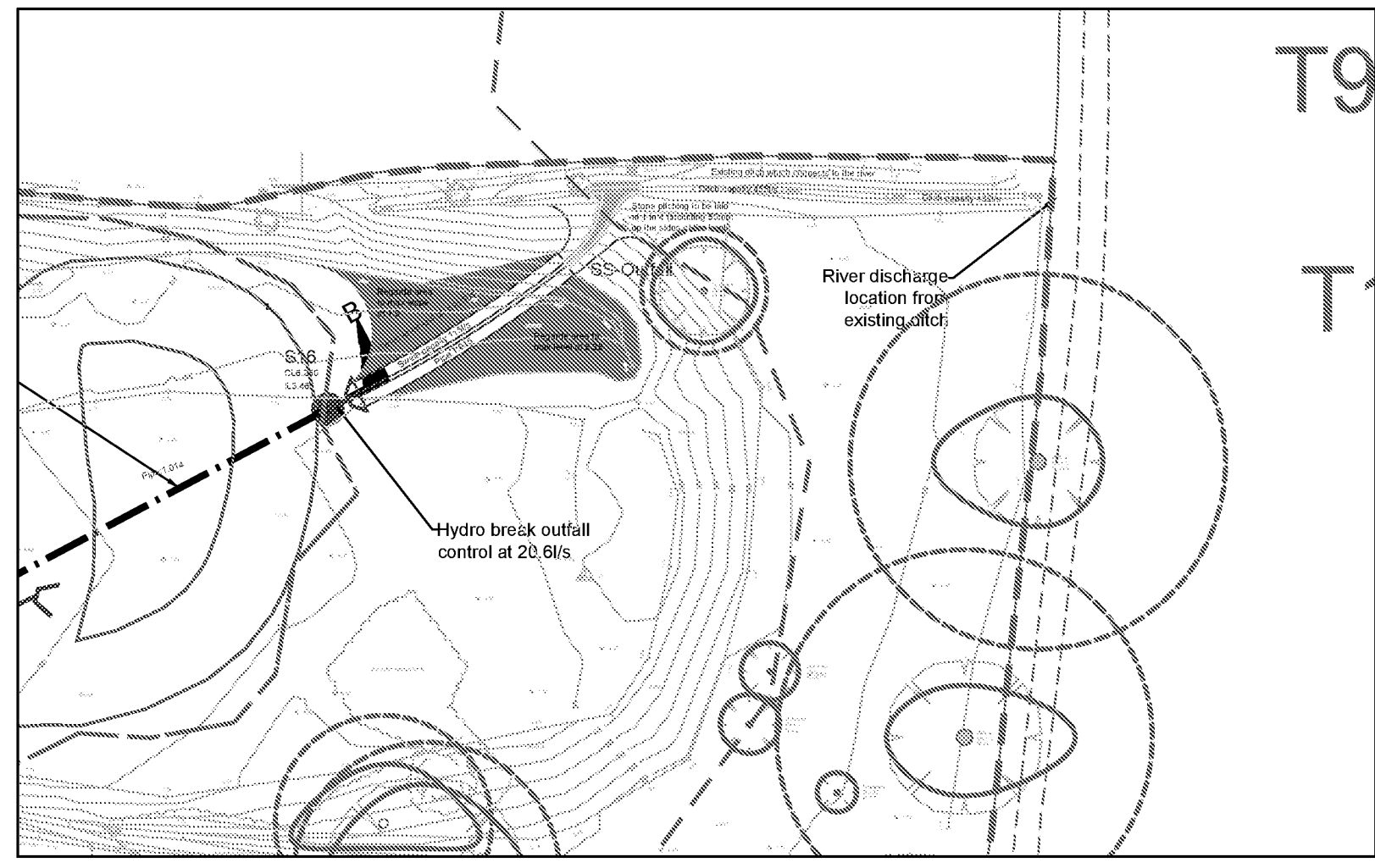
ARUN DISTRICT COUNCIL

**SFRA: APPENDIX E
SURFACE WATER FLOOD RISK**

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Appendix I Surface Water Strategy



- NOTES**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH 20-061-017 AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 - DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
 - ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE SHOWN.
 - ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS. DRAWING BASED ON TOPOGRAPHICAL SURVEY PROVIDED BY OTHERS; C&A ARE NOT RESPONSIBLE FOR ANY INACCURACIES.
 - SECTIONS CAN BE FOUND ON DRAWING 20-061-017

- LEGEND:**
- Surface Water Drainage
 - Flood zone 2 boundary
 - Existing 450 Ø potable water main W/ 3m Easement
 - SuDS Storage Structure (See Drawing 20-061-017)
 - Conveyance Swale
 - Headwall
 - Lined permeable paving
 - Lined permeable paving with cellular storage

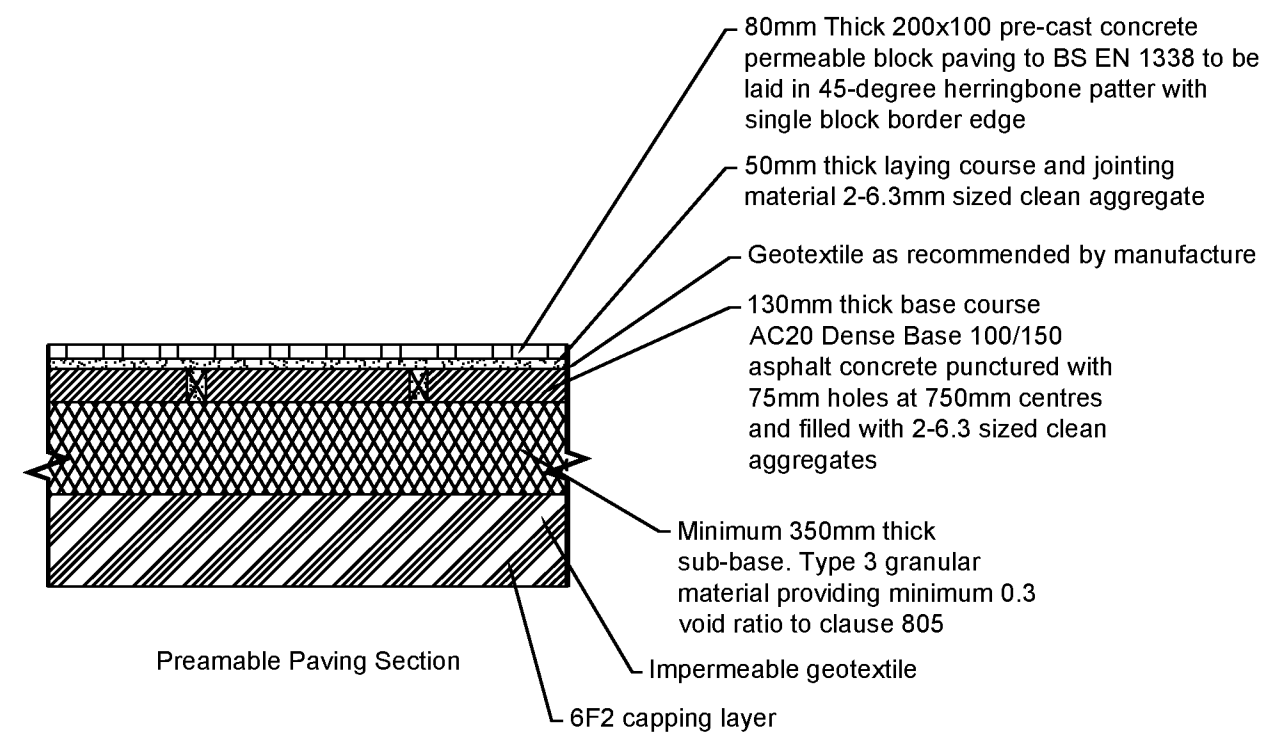
H	Drainage Updates	SC	SAC	GAC	Aug 2021
G	Layout Updates	SC	SAC	GAC	Jul 2021
F	Discharge swale shown connecting to existing ditch	GW	SAC	GAC	Jul 2021
E	FFL's added & discharge swale updated	GW	SAC	GAC	Jul 2021
D	Drainage updated to suit, updated Layout	SC	SAC	GAC	Jul 2021
C	Drainage updated to suit, updated Layout	SC	SAC	GAC	Apr 2021
B	Drainage updated to suit, updated Layout (02L)	JT	MR	GAC	Feb 2021
A	Drp renamed, updated Layout (02K)	JT	MR	GAC	Jan 2021
Rev	Amendments	Drm	CHK	App	Date

Charles & Associates

Issued by: ☒ Landmark House Station Road, Basingstoke, Hampshire RG27 7BA, 01256 638429 enquiries@c-a-uk.com www.c-a-uk.com

☐ Park House East Mallory Trust Estate, Bramborne Lane, Aylesford, Kent ME13 2AN, 01752 448120

Job Title		
Land East of Woodgate Lane		
Drawing Title		
Preliminary Drainage Strategy		
Client		
Pye Homes		
Scale	Date	Designed
1:500@A1	Jan 21	JT
Drawn	Checked	Approved
JT	TSH	GAC
Job No	Drawing No	Rev
20-061	20-061-007	H



Drawn JT	Checked SAC	Approved GAC
Job No 20-061	Drawing No 20-061-017	Rev -

Appendix J Surface Water Calcs



C & A Consulting Engineers Ltd										Page 1																																																																																																																																																																																																																																							
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<u>STORM SEWER DESIGN by the Mbdified Rational Method</u> <u>Design Criteria for Storm</u> Pipe Sizes STANDARD Manhole Sizes STANDARD <table><tr><td colspan="12">FSR Rainfall Model - England and Wales</td></tr><tr><td colspan="2">Return Period (years)</td><td colspan="2">100</td><td colspan="2"></td><td colspan="2">PIMP (%)</td><td colspan="2">100</td><td colspan="2"></td></tr><tr><td colspan="2">M5-60 (mm)</td><td colspan="2">19.500</td><td colspan="2"></td><td colspan="2">Add Flow / Climate Change (%)</td><td colspan="2">0</td><td colspan="2"></td></tr><tr><td colspan="2">Ratio R</td><td colspan="2">0.333</td><td colspan="2"></td><td colspan="2">Minimum Backdrop Height (m)</td><td colspan="2">0.200</td><td colspan="2"></td></tr><tr><td colspan="2">Maximum Rainfall (mm/hr)</td><td colspan="2">50</td><td colspan="2"></td><td colspan="2">Maximum Backdrop Height (m)</td><td colspan="2">1.500</td><td colspan="2"></td></tr><tr><td colspan="2">Maximum Time of Concentration (mins)</td><td colspan="2">30</td><td colspan="2">Mn Design Depth for Optimisation (m)</td><td colspan="2">1.200</td><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2">Foul Sewage (l/s/ha)</td><td colspan="2">0.000</td><td colspan="2">Mn Vel for Auto Design only (m/s)</td><td colspan="2">1.00</td><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2">Volumetric Runoff Coeff.</td><td colspan="2">0.750</td><td colspan="2">Mn Slope for Optimisation (1:X)</td><td colspan="2">500</td><td colspan="2"></td><td colspan="2"></td></tr></table> Designed with Level Soffits												FSR Rainfall Model - England and Wales												Return Period (years)		100				PIMP (%)		100				M5-60 (mm)		19.500				Add Flow / Climate Change (%)		0				Ratio R		0.333				Minimum Backdrop Height (m)		0.200				Maximum Rainfall (mm/hr)		50				Maximum Backdrop Height (m)		1.500				Maximum Time of Concentration (mins)		30		Mn Design Depth for Optimisation (m)		1.200						Foul Sewage (l/s/ha)		0.000		Mn Vel for Auto Design only (m/s)		1.00						Volumetric Runoff Coeff.		0.750		Mn Slope for Optimisation (1:X)		500																																																																																																																																											
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PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design																																																																																																																																																																																																																																						
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C & A Consulting Engineers Ltd										Page 2	
Landmark House Station Road, Hook Hampshire RG27 9HA						Designed by Scott Collis Checked by					
Date 05/08/2021 11:33 File 20-061 SW NETWORK SC											
Innovyze						Network 2019.1					
Network Design Table for Storm											
PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
3.003	27.020	0.067	403.6	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	33.152	0.082	403.6	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	5.182	0.010	545.4	0.020	5.00	0.0	0.600	o	450	Pipe/Conduit	
4.001	5.182	0.010	545.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	17.243	0.043	402.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	4.638	0.009	545.6	0.053	5.00	0.0	0.600	o	450	Pipe/Conduit	
5.001	4.638	0.009	545.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	36.843	1.649	22.3	0.053	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	15.018	1.020	14.7	0.165	5.00	0.0	0.600	o	450	Pipe/Conduit	
6.001	25.454	0.190	134.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.002	50.069	0.123	407.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.003	35.599	0.088	406.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.004	25.331	0.046	550.7	0.054	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.005	24.390	0.101	241.5	0.025	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	6.501	0.630	10.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
Network Results Table											
PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
3.003	50.00	6.10	7.284	0.206	0.0	0.0	0.0	1.01	160.0	27.9	
1.004	50.00	6.65	7.217	0.326	0.0	0.0	0.0	1.01	160.0	44.1	
4.000	50.00	5.10	7.189	0.020	0.0	0.0	0.0	0.86	137.3	2.7	
4.001	50.00	5.20	7.180	0.020	0.0	0.0	0.0	0.86	137.3	2.7	
1.005	50.00	6.94	7.134	0.346	0.0	0.0	0.0	1.01	160.1	46.9	
5.000	50.00	5.09	7.153	0.053	0.0	0.0	0.0	0.86	137.3	7.2	
5.001	50.00	5.18	7.145	0.053	0.0	0.0	0.0	0.86	137.3	7.2	
1.006	50.00	7.08	7.092	0.452	0.0	0.0	0.0	4.32	686.5	61.2	
6.000	50.00	5.05	7.010	0.165	0.0	0.0	0.0	5.32	846.0	22.3	
6.001	50.00	5.29	5.990	0.165	0.0	0.0	0.0	1.75	279.1	22.3	
6.002	50.00	6.12	5.800	0.165	0.0	0.0	0.0	1.00	159.3	22.3	
6.003	50.00	6.71	5.677	0.165	0.0	0.0	0.0	1.00	159.5	22.3	
6.004	50.00	7.21	5.589	0.219	0.0	0.0	0.0	0.86	136.7	29.7	
6.005	50.00	7.52	5.543	0.244	0.0	0.0	0.0	1.30	207.4	33.0	
1.007	50.00	7.53	5.442	0.696	0.0	0.0	0.0	6.36	1011.0	94.2	
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
7.000	80.776	0.815	99.1	0.066	5.00	0.0	0.600	o	450	Pipe/Conduit	
8.000	14.809	0.253	58.5	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	28.507	0.487	58.5	0.035	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	53.806	0.543	99.0	0.085	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.001	31.452	0.077	408.9	0.060	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.002	31.485	0.077	409.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	38.857	0.096	404.8	0.054	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	41.615	0.103	404.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	50.674	0.857	59.1	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	18.749	0.047	400.0	0.063	5.00	0.0	0.600	o	450	Pipe/Conduit	
9.001	18.334	0.046	400.0	0.038	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.002	13.630	0.034	400.0	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.003	39.695	0.099	400.0	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.004	43.137	0.444	97.2	0.090	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.005	23.504	0.060	391.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	21.610	0.054	400.0	0.030	5.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
7.000	50.00	5.66	7.400	0.066	0.0	0.0	0.0	2.04	324.8	8.9
8.000	50.00	5.24	6.600	0.000	0.0	0.0	0.0	1.01	7.9	0.0
8.001	50.00	5.72	6.347	0.035	0.0	0.0	0.0	1.01	7.9	4.7
8.002	50.00	6.60	5.809	0.120	0.0	0.0	0.0	1.01	17.8	16.2
7.001	50.00	7.13	4.966	0.246	0.0	0.0	0.0	1.00	158.9	33.3
7.002	50.00	7.65	4.889	0.246	0.0	0.0	0.0	1.00	158.8	33.3
1.008	50.00	8.30	4.812	0.996	0.0	0.0	0.0	1.00	159.7	134.9
1.009	50.00	8.99	4.716	0.996	0.0	0.0	0.0	1.00	159.7	134.9
1.010	50.00	9.31	4.613	1.026	0.0	0.0	0.0	2.65	421.2	138.9
9.000	50.00	5.31	7.520	0.063	0.0	0.0	0.0	1.01	160.7	8.5
9.001	50.00	5.61	7.473	0.101	0.0	0.0	0.0	1.01	160.7	13.7
9.002	50.00	5.84	7.427	0.138	0.0	0.0	0.0	1.01	160.7	18.7
9.003	50.00	6.49	7.393	0.238	0.0	0.0	0.0	1.01	160.7	32.2
9.004	50.00	6.84	7.294	0.328	0.0	0.0	0.0	2.06	328.1	44.4
9.005	50.00	7.22	6.850	0.328	0.0	0.0	0.0	1.02	162.4	44.4
10.000	50.00	5.36	7.500	0.030	0.0	0.0	0.0	1.01	160.7	4.1
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PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.001	79.567	0.199	400.0	0.193	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
10.002	47.697	0.119	400.0	0.046	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.006	12.244	0.140	87.5	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.007	66.556	0.165	403.4	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.008	72.027	0.186	387.2	0.600	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.009	149.621	1.948	76.8	0.070	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.010	35.070	0.550	63.8	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.011	41.219	0.176	234.2	0.091	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
1.011	25.916	0.144	180.0	0.095	0.00	0.0	0.600	o	525	Pi pe/ Conduit	
1.012	48.097	0.098	491.3	0.142	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.013	15.896	0.189	84.1	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.014	18.776	0.300	62.6	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.015	26.409	0.053	500.0	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
Network Results Table											
PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
10.001	50.00	6.67	7.446	0.223	0.0	0.0	0.0	1.01	160.7	30.2	
10.002	50.00	7.46	7.250	0.269	0.0	0.0	0.0	1.01	160.7	36.4	
9.006	50.00	7.55	6.790	0.597	0.0	0.0	0.0	2.17	345.9	80.8	
9.007	50.00	8.65	7.086	0.597	0.0	0.0	0.0	1.01	160.0	80.8	
9.008	50.00	9.82	6.921	1.197	0.0	0.0	0.0	1.03	163.3	162.1	
9.009	50.00	10.90	6.735	1.267	0.0	0.0	0.0	2.32	369.2	171.6	
9.010	50.00	11.12	4.787	1.267	0.0	0.0	0.0	2.55	405.5	171.6	
9.011	50.00	11.64	3.932	1.358	0.0	0.0	0.0	1.32	210.6	183.9	
1.011	50.00	11.90	3.681	2.479	0.0	0.0	0.0	1.67	360.8	335.7	
1.012	50.00	12.58	3.387	2.621	0.0	0.0	0.0	1.18	420.7	354.9	
1.013	50.00	12.68	3.289	2.621	0.0	0.0	0.0	2.86	1023.2	354.9	
1.014	50.00	12.77	3.100	2.621	0.0	0.0	0.0	3.32	1186.8	354.9	
1.015	50.00	13.15	2.800	2.621	0.0	0.0	0.0	1.17	417.0	354.9	
Free Flowing Outfall Details for Storm											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	M n I. Level (m)	D, L (mm)	W (mm)					
1.015	S-Outfall	5.000	2.747	1.000	0	0					
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10mE/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	12
Number of Online Controls	10	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.500	Storm Duration (mins)	30
Ratio R	0.333		

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Online Controls for Storm Orifice Manhole: 2, DS/PN: 1.001, Volume (mE): 4.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.378 Orifice Manhole: 18, DS/PN: 2.001, Volume (mE): 4.3 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.379 Orifice Manhole: 20, DS/PN: 3.001, Volume (mE): 3.9 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.340 Orifice Manhole: 24, DS/PN: 4.001, Volume (mE): 3.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.180 Orifice Manhole: 7, DS/PN: 1.006, Volume (mE): 5.9 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.092 Orifice Manhole: 29, DS/PN: 6.002, Volume (mE): 6.2 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 5.800 Orifice Manhole: 9, DS/PN: 1.008, Volume (mE): 10.5 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 4.812 Orifice Manhole: 40, DS/PN: 9.001, Volume (mE): 5.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.473 Hydro-Brake÷ Optimum Manhole: 46, DS/PN: 9.007, Volume (mE): 3.6 <table><tr><td>Unit Reference</td><td>MD-SHE-0212-2500-1500-2500</td></tr><tr><td>Design Head (m)</td><td>1.500</td></tr><tr><td>Design Flow (l/s)</td><td>25.0</td></tr><tr><td>Flush-Flow</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>212</td></tr><tr><td>Invert Level (m)</td><td>7.086</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1800</td></tr></table> ø1982-2019 Innovyze			Unit Reference	MD-SHE-0212-2500-1500-2500	Design Head (m)	1.500	Design Flow (l/s)	25.0	Flush-Flow	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	212	Invert Level (m)	7.086	Minimum Outlet Pipe Diameter (mm)	225	Suggested Manhole Diameter (mm)	1800
Unit Reference	MD-SHE-0212-2500-1500-2500																							
Design Head (m)	1.500																							
Design Flow (l/s)	25.0																							
Flush-Flow	Calculated																							
Objective	Minimise upstream storage																							
Application	Surface																							
Sump Available	Yes																							
Diameter (mm)	212																							
Invert Level (m)	7.086																							
Minimum Outlet Pipe Diameter (mm)	225																							
Suggested Manhole Diameter (mm)	1800																							

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<u>Hydro- Brake÷ Optimum Manhole: 46, DS/PN: 9.007, Volume (mE): 3.6</u>					
Control Points		Head (m)	Flow (l/s)	Control Points	
Design Point (Calculated)		1.500	25.0	Kick-Flow	
Flush-Flow		0.455	25.0	Mean Flow over Head Range	
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake÷ Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum be utilised then these storage routing calculations will be invalidated					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	22.5	3.000	34.8
0.200	20.6	1.400	24.2	3.500	37.5
0.300	24.2	1.600	25.8	4.000	40.0
0.400	24.9	1.800	27.3	4.500	42.4
0.500	24.9	2.000	28.7	5.000	44.6
0.600	24.7	2.200	30.0	5.500	46.7
0.800	23.7	2.400	31.3	6.000	48.7
1.000	20.7	2.600	32.5	6.500	50.6
<u>Hydro- Brake÷ Optimum Manhole: 16, DS/PN: 1.015, Volume (mE): 11.8</u>					
Unit Reference MD-SHE-0199-2000-1000-2000					
Design Head (m) 1.000					
Design Flow (l/s) 20.0					
Flush-Flow Calculated					
Objective Minimise upstream storage					
Application Surface					
Sump Available Yes					
Diameter (mm) 199					
Invert Level (m) 2.800					
Minimum Outlet Pipe Diameter (mm) 225					
Suggested Manhole Diameter (mm) 1500					
Control Points		Head (m)	Flow (l/s)	Control Points	
Design Point (Calculated)		1.000	20.0	Kick-Flow	
Flush-Flow		0.340	20.0	Mean Flow over Head Range	
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake÷ Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum be utilised then these storage routing calculations will be invalidated					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.9	0.600	19.0	1.600	25.0
0.200	18.7	0.800	18.0	1.800	26.5
0.300	19.9	1.000	20.0	2.000	27.8
0.400	19.9	1.200	21.8	2.200	29.1
0.500	19.5	1.400	23.5	2.400	30.4
				4.500	41.1
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Storage Structures for Storm

Complex Manhole: 1, DS/PN: 1.000

Cellular Storage

Invert Level (m) 7.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	187.0	0.0	1.151	187.0	0.0
1.150	187.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 5.3
Membrane Percolation (mm/hr) 1000 Length (m) 35.0
Max Percolation (l/s) 51.5 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 8.550 Membrane Depth (mm) 260

Complex Manhole: 17, DS/PN: 2.000

Cellular Storage

Invert Level (m) 7.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	316.0	0.0	1.150	316.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 13.5
Membrane Percolation (mm/hr) 1000 Length (m) 23.0
Max Percolation (l/s) 86.3 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 8.550 Membrane Depth (mm) 0

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Complex Manhole: 19, DS/PN: 3.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	56.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.359	Membrane Depth (mm)	260

Cellular Storage

Invert Level (m)	7.359	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	208.0	0.0	0.991	208.0	0.0

Complex Manhole: 23, DS/PN: 4.000

Cellular Storage

Invert Level (m)	7.189	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	219.0	0.0	1.291	219.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	31.0
Max Percolation (l/s)	60.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.480	Membrane Depth (mm)	260

Complex Manhole: 25, DS/PN: 5.000

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<u>Cellular Storage</u> Invert Level (m) 7.153 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>360.0</td> <td>0.0</td> <td>1.297</td> <td>360.0</td> <td>0.0</td> </tr> </tbody> </table> <u>Porous Car Park</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8 Membrane Percolation (mm/hr) 1000 Length (m) 75.0 Max Percolation (l/s) 100.0 Slope (1:X) 1000.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 8.450 Membrane Depth (mm) 260 <u>Complex Manhole: 28, DS/PN: 6.001</u> <u>Porous Car Park</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 7.0 Membrane Percolation (mm/hr) 1000 Length (m) 31.0 Max Percolation (l/s) 60.3 Slope (1:X) 1000.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 5.690 Membrane Depth (mm) 260 <u>Cellular Storage</u> Invert Level (m) 5.690 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>221.0</td> <td>0.0</td> <td>1.460</td> <td>221.0</td> <td>0.0</td> </tr> </tbody> </table> <u>Complex Manhole: 36, DS/PN: 8.000</u> <u>Cellular Storage</u> Invert Level (m) 6.600 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	360.0	0.0	1.297	360.0	0.0	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	221.0	0.0	1.460	221.0	0.0
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)																					
0.000	360.0	0.0	1.297	360.0	0.0																					
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Cellular Storage

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	208.0	0.0	1.150	208.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.0
Max Percolation (l/s)	57.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.750	Membrane Depth (mm)	260

Complex Manhole: 39, DS/PN: 9.000

Cellular Storage

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.0
Max Percolation (l/s)	57.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.750	Membrane Depth (mm)	260

Complex Manhole: 39, DS/PN: 9.000

Cellular Storage

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	180.0	0.0	1.150	180.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	46.9	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.670	Membrane Depth (mm)	0

Tank or Pond Manhole: 45, DS/PN: 9.006

Invert Level (m) 7.127

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.4	1.500	217.0

Swale Manhole: 47, DS/PN: 9.008

Warning: - Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	46.9	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.670	Membrane Depth (mm)	0

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<u>Swale Manhole: 47, DS/PN: 9.008</u> <table style="margin: auto; border: none;"> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>4.0</td> </tr> <tr> <td>Porosity</td> <td>1.00</td> <td>Slope (1:X)</td> <td>750.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>8.480</td> <td>Cap Volume</td> <td>Depth (m) 0.000</td> </tr> <tr> <td>Base Width (m)</td> <td>1.0</td> <td>Cap Infiltration</td> <td>Depth (m) 0.000</td> </tr> <tr> <td>Length (m)</td> <td>65.0</td> <td>Include Swale Volume</td> <td>Yes</td> </tr> </table> <u>Porous Car Park Manhole: 50, DS/PN: 9.011</u> <table style="margin: auto; border: none;"> <tr> <td>Infiltration Coefficient</td> <td>Base (m/hr) 0.00000</td> <td>Width (m)</td> <td>8.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>25.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>55.6</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>3.932</td> <td>Membrane Depth (mm)</td> <td>0</td> </tr> </table> <u>Tank or Pond Manhole: 15, DS/PN: 1.014</u> Invert Level (m) 3.500 <table style="margin: auto; border: none;"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>92.0</td> <td>1.600</td> <td>755.0</td> </tr> </tbody> </table>			Safety Factor	2.0	Side Slope (1:X)	4.0	Porosity	1.00	Slope (1:X)	750.0	Invert Level (m)	8.480	Cap Volume	Depth (m) 0.000	Base Width (m)	1.0	Cap Infiltration	Depth (m) 0.000	Length (m)	65.0	Include Swale Volume	Yes	Infiltration Coefficient	Base (m/hr) 0.00000	Width (m)	8.0	Membrane Percolation (mm/hr)	1000	Length (m)	25.0	Max Percolation (l/s)	55.6	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	3.932	Membrane Depth (mm)	0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	92.0	1.600	755.0
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
<u>Simulation Criteria</u>									
Areal Reduction Factor		1.000	Additional Flow - % of Total Flow		0.000				
Hot Start (mins)		0	MADD Factor * 10mE/ha Storage		2.000				
Hot Start Level (mm)		0	Inlet Coefficient		0.800				
Manhole Headloss Coeff (Global)		0.500	Flow per Person per Day (l/per/day)		0.000				
Foul Sewage per hectare (l/s)		0.000							
Number of Input Hydrographs		0	Number of Storage Structures		12				
Number of Online Controls		10	Number of Time/Area Diagrams		0				
Number of Offline Controls		0	Number of Real Time Controls		0				
<u>Synthetic Rainfall Details</u>									
Rainfall Model		FSR	Ratio R		0.336				
Region England and Wales		Cv (Summer)	0.750						
M5-60 (mm)		19.400	Cv (Winter)		0.840				
Margin for Flood Risk Warning (mm)					300.0				
Analysis Timestep		2.5 Second Increment (Extended)							
DTS Status					ON				
DVD Status					ON				
Inertia Status					ON				
Profile(s)		Summer and Winter							
Duration(s) (mins)		15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080							
Return Period(s) (years)		1, 30, 100							
Climate Change (%)		0, 0, 0							
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	180 Wnter	100	+0%					7.446
1.001	2	180 Wnter	100	+0%					7.440
2.000	17	360 Wnter	100	+0%					7.462
2.001	18	360 Wnter	100	+0%					7.458
1.002	3	15 Wnter	100	+0%					7.516
1.003	4	15 Wnter	100	+0%					7.516
3.000	19	240 Wnter	100	+0%					7.514
3.001	20	240 Wnter	100	+0%					7.513
3.002	21	15 Wnter	100	+0%					7.559
3.003	22	15 Wnter	100	+0%					7.550
1.004	5	15 Wnter	100	+0%					7.521
4.000	23	2160 Wnter	100	+0%					7.235
4.001	24	15 Wnter	100	+0%					7.310
1.005	6	15 Wnter	100	+0%					7.481
5.000	25	180 Wnter	100	+0%					7.306
5.001	26	15 Wnter	100	+0%					7.394
1.006	7	15 Wnter	100	+0%					7.460
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>							
PN	US/ MH Name	Surcharged Depth (m)	Flooded Volume (mE)	Flow / Cap.	Overflow (l/s)	Pi pe Flow (l/s)	Status Level Exceeded
1.000	1	-0.404	0.000	0.01		0.7	OK
1.001	2	-0.388	0.000	0.01		0.7	OK
2.000	17	-0.388	0.000	0.01		1.0	OK
2.001	18	-0.371	0.000	0.01		1.0	OK
1.002	3	-0.289	0.000	0.04		3.3	OK
1.003	4	-0.269	0.000	0.02		4.5	OK
3.000	19	-0.295	0.000	0.04		2.9	OK
3.001	20	-0.276	0.000	0.04		2.9	OK
3.002	21	-0.211	0.000	0.28		29.5	OK
3.003	22	-0.183	0.000	0.26		35.8	OK
1.004	5	-0.145	0.000	0.23		32.1	OK
4.000	23	-0.404	0.000	0.00		0.4	OK
4.001	24	-0.320	0.000	0.01		1.3	OK
1.005	6	-0.104	0.000	0.24		27.4	OK
5.000	25	-0.297	0.000	0.03		3.7	OK
5.001	26	-0.201	0.000	0.03		3.1	OK
1.006	7	-0.082	0.000	0.02		11.7	OK
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Summary of Critical Results by Maximum Level (Rank 1) for Storm									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.000	27	15 W nter	100	+0%					7.112
6.001	28	180 W nter	100	+0%					6.076
6.002	29	60 W nter	100	+0%					6.170
6.003	30	60 W nter	100	+0%	30/15 W nter				7.040
6.004	31	60 W nter	100	+0%	30/15 Summer				7.060
6.005	32	60 W nter	100	+0%	30/15 Summer				7.072
1.007	8	60 W nter	100	+0%	30/15 Summer				7.081
7.000	33	15 W nter	100	+0%					7.490
8.000	36	60 W nter	100	+0%					6.652
8.001	37	15 W nter	100	+0%	30/15 Summer				7.450
8.002	38	15 W nter	100	+0%	30/15 Summer				7.534
7.001	34	60 W nter	100	+0%	1/15 Summer				7.101
7.002	35	60 W nter	100	+0%	1/15 Summer				7.091
1.008	9	60 W nter	100	+0%	1/15 Summer				7.081
1.009	10	240 W nter	100	+0%	100/180 W nter				5.263
1.010	11	240 W nter	100	+0%	100/120 W nter				5.255
9.000	39	120 W nter	100	+0%					7.807
9.001	40	120 W nter	100	+0%					7.807
9.002	41	60 W nter	100	+0%	100/15 W nter				8.087
9.003	42	60 W nter	100	+0%	30/60 W nter				8.094
9.004	43	60 W nter	100	+0%	30/30 Summer				8.098
9.005	44	60 W nter	100	+0%	1/15 Summer				8.096
10.000	51	60 W nter	100	+0%	100/15 W nter				8.115
10.001	52	60 W nter	100	+0%	100/15 W nter				8.114
10.002	53	60 W nter	100	+0%	30/15 W nter				8.105
9.006	45	60 W nter	100	+0%	1/15 Summer				8.095
9.007	46	60 W nter	100	+0%	30/15 Summer				8.096
9.008	47	15 W nter	100	+0%	100/15 Summer				7.497
9.009	48	30 W nter	100	+0%					6.982
9.010	19	360 W nter	100	+0%	100/180 W nter				5.346
9.011	50	240 W nter	100	+0%	30/30 Summer				5.329
1.011	12	240 W nter	100	+0%	30/15 Summer				5.246
1.012	13	360 W nter	100	+0%	1/60 W nter				5.134
1.013	14	360 W nter	100	+0%	1/60 W nter				5.127
1.014	15	360 W nter	100	+0%	1/15 W nter				5.013
1.015	16	480 W nter	100	+0%	1/15 Summer				5.005
PN	US/MH Name		Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pi pe Flow (l/s)	Status	Level Exceeded
6.000	27		-0.348	0.000	0.12		66.6	OK	
6.001	28		-0.364	0.000	0.02		5.7	OK	
6.002	29		-0.080	0.000	0.01		1.1	OK	
6.003	30		0.913	0.000	0.03		4.6	SURCHARGED	
6.004	31		1.021	0.000	0.06		6.3	SURCHARGED	
6.005	32		1.079	0.000	0.04		7.2	SURCHARGED	
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>								
		Surcharged	Flooded			Pipe		
PN	US/MH Name	Depth (m)	Volume (mE)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded
1.007	8	1.189	0.000	0.04		16.0	SURCHARGED	
7.000	33	-0.360	0.000	0.09		26.6	OK	
8.000	36	-0.048	0.000	0.46		3.5	OK	
8.001	37	1.003	0.000	0.81		6.3	SURCHARGED	
8.002	38	1.575	0.000	1.49		26.0	SURCHARGED	
7.001	34	1.685	0.000	0.31		42.7	SURCHARGED	
7.002	35	1.752	0.000	0.29		39.9	SURCHARGED	
1.008	9	1.819	0.000	0.21		29.1	SURCHARGED	
1.009	10	0.097	0.000	0.17		24.2	SURCHARGED	
1.010	11	0.191	0.000	0.07		25.3	SURCHARGED	
9.000	39	-0.163	0.000	0.07		8.3	OK	
9.001	40	-0.116	0.000	0.07		8.6	OK	
9.002	41	0.210	0.000	0.09		9.0	SURCHARGED	
9.003	42	0.251	0.000	0.15		22.0	SURCHARGED	
9.004	43	0.354	0.000	0.12		34.6	SURCHARGED	
9.005	44	0.796	0.000	0.25		33.3	SURCHARGED	
10.000	51	0.165	0.000	0.04		5.9	SURCHARGED	
10.001	52	0.218	0.000	0.27		41.4	SURCHARGED	
10.002	53	0.405	0.000	0.30		44.0	SURCHARGED	
9.006	45	0.855	0.000	0.13		28.1	SURCHARGED	
9.007	46	0.560	0.000	0.17		24.9	SURCHARGED	
9.008	47	0.126	0.000	1.26		191.6	SURCHARGED	
9.009	48	-0.203	0.000	0.57		202.4	OK	
9.010	19	0.109	0.000	0.19		67.4	SURCHARGED	
9.011	50	0.947	0.000	0.39		72.7	SURCHARGED	
1.011	12	1.040	0.000	0.35		103.1	FLOOD RISK	
1.012	13	1.072	0.000	0.26		94.6	SURCHARGED	
1.013	14	1.163	0.000	0.17		94.3	SURCHARGED	
1.014	15	1.238	0.000	0.04		30.6	SURCHARGED	
1.015	16	1.530	0.000	0.09		28.9	SURCHARGED	
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<u>STORM SEWER DESIGN by the Mbdified Rational Method</u> <u>Design Criteria for Storm</u> Pipe Sizes STANDARD Manhole Sizes STANDARD FSR Rainfall Model - England and Wales <table><tr><td>Return Period (years)</td><td>100</td><td>PIMP (%)</td><td>100</td></tr><tr><td>M5-60 (mm)</td><td>19.500</td><td>Add Flow / Climate Change (%)</td><td>0</td></tr><tr><td>Ratio R</td><td>0.333</td><td>Minimum Backdrop Height (m)</td><td>0.200</td></tr><tr><td>Maximum Rainfall (mm/hr)</td><td>50</td><td>Maximum Backdrop Height (m)</td><td>1.500</td></tr><tr><td>Maximum Time of Concentration (mins)</td><td>30</td><td>Mn Design Depth for Optimisation (m)</td><td>1.200</td></tr><tr><td>Foul Sewage (l/s/ha)</td><td>0.000</td><td>Mn Vel for Auto Design only (m/s)</td><td>1.00</td></tr><tr><td>Volumetric Runoff Coeff.</td><td>0.750</td><td>Mn Slope for Optimisation (1:X)</td><td>500</td></tr></table> Designed with Level Soffits												Return Period (years)	100	PIMP (%)	100	M5-60 (mm)	19.500	Add Flow / Climate Change (%)	0	Ratio R	0.333	Minimum Backdrop Height (m)	0.200	Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500	Maximum Time of Concentration (mins)	30	Mn Design Depth for Optimisation (m)	1.200	Foul Sewage (l/s/ha)	0.000	Mn Vel for Auto Design only (m/s)	1.00	Volumetric Runoff Coeff.	0.750	Mn Slope for Optimisation (1:X)	500																																																																																																																																																																																																										
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PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design																																																																																																																																																																																																																																						
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3.003	27.020	0.067	403.6	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	33.152	0.082	403.6	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	5.182	0.010	545.4	0.020	5.00	0.0	0.600	o	450	Pipe/Conduit	
4.001	5.182	0.010	545.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	17.243	0.043	402.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	4.638	0.009	545.6	0.053	5.00	0.0	0.600	o	450	Pipe/Conduit	
5.001	4.638	0.009	545.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	36.843	1.649	22.3	0.053	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	15.018	1.020	14.7	0.165	5.00	0.0	0.600	o	450	Pipe/Conduit	
6.001	25.454	0.190	134.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.002	50.069	0.123	407.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.003	35.599	0.088	406.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.004	25.331	0.046	550.7	0.054	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.005	24.390	0.101	241.5	0.025	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	6.501	0.630	10.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
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PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
3.003	50.00	6.10	7.284	0.206	0.0	0.0	0.0	1.01	160.0	27.9	
1.004	50.00	6.65	7.217	0.326	0.0	0.0	0.0	1.01	160.0	44.1	
4.000	50.00	5.10	7.189	0.020	0.0	0.0	0.0	0.86	137.3	2.7	
4.001	50.00	5.20	7.180	0.020	0.0	0.0	0.0	0.86	137.3	2.7	
1.005	50.00	6.94	7.134	0.346	0.0	0.0	0.0	1.01	160.1	46.9	
5.000	50.00	5.09	7.153	0.053	0.0	0.0	0.0	0.86	137.3	7.2	
5.001	50.00	5.18	7.145	0.053	0.0	0.0	0.0	0.86	137.3	7.2	
1.006	50.00	7.08	7.092	0.452	0.0	0.0	0.0	4.32	686.5	61.2	
6.000	50.00	5.05	7.010	0.165	0.0	0.0	0.0	5.32	846.0	22.3	
6.001	50.00	5.29	5.990	0.165	0.0	0.0	0.0	1.75	279.1	22.3	
6.002	50.00	6.12	5.800	0.165	0.0	0.0	0.0	1.00	159.3	22.3	
6.003	50.00	6.71	5.677	0.165	0.0	0.0	0.0	1.00	159.5	22.3	
6.004	50.00	7.21	5.589	0.219	0.0	0.0	0.0	0.86	136.7	29.7	
6.005	50.00	7.52	5.543	0.244	0.0	0.0	0.0	1.30	207.4	33.0	
1.007	50.00	7.53	5.442	0.696	0.0	0.0	0.0	6.36	1011.0	94.2	
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7.000	80.776	0.815	99.1	0.066	5.00	0.0	0.600	o	450	Pipe/Conduit	
8.000	14.809	0.253	58.5	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	28.507	0.487	58.5	0.035	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	53.806	0.543	99.0	0.085	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.001	31.452	0.077	408.9	0.060	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.002	31.485	0.077	409.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	38.857	0.096	404.8	0.054	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	41.615	0.103	404.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	50.674	0.857	59.1	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	18.749	0.047	400.0	0.063	5.00	0.0	0.600	o	450	Pipe/Conduit	
9.001	18.334	0.046	400.0	0.038	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.002	13.630	0.034	400.0	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.003	39.695	0.099	400.0	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.004	43.137	0.444	97.2	0.090	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.005	23.504	0.060	391.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	21.610	0.054	400.0	0.030	5.00	0.0	0.600	o	450	Pipe/Conduit	
Network Results Table											
PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
7.000	50.00	5.66	7.400	0.066	0.0	0.0	0.0	2.04	324.8	8.9	
8.000	50.00	5.24	6.600	0.000	0.0	0.0	0.0	1.01	7.9	0.0	
8.001	50.00	5.72	6.347	0.035	0.0	0.0	0.0	1.01	7.9	4.7	
8.002	50.00	6.60	5.809	0.120	0.0	0.0	0.0	1.01	17.8	16.2	
7.001	50.00	7.13	4.966	0.246	0.0	0.0	0.0	1.00	158.9	33.3	
7.002	50.00	7.65	4.889	0.246	0.0	0.0	0.0	1.00	158.8	33.3	
1.008	50.00	8.30	4.812	0.996	0.0	0.0	0.0	1.00	159.7	134.9	
1.009	50.00	8.99	4.716	0.996	0.0	0.0	0.0	1.00	159.7	134.9	
1.010	50.00	9.31	4.613	1.026	0.0	0.0	0.0	2.65	421.2	138.9	
9.000	50.00	5.31	7.520	0.063	0.0	0.0	0.0	1.01	160.7	8.5	
9.001	50.00	5.61	7.473	0.101	0.0	0.0	0.0	1.01	160.7	13.7	
9.002	50.00	5.84	7.427	0.138	0.0	0.0	0.0	1.01	160.7	18.7	
9.003	50.00	6.49	7.393	0.238	0.0	0.0	0.0	1.01	160.7	32.2	
9.004	50.00	6.84	7.294	0.328	0.0	0.0	0.0	2.06	328.1	44.4	
9.005	50.00	7.22	6.850	0.328	0.0	0.0	0.0	1.02	162.4	44.4	
10.000	50.00	5.36	7.500	0.030	0.0	0.0	0.0	1.01	160.7	4.1	
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Network Design Table for Storm											
PN	Length (m)	Fall (m)	Slope (1:X)	I. Area (ha)	T. E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.001	79.567	0.199	400.0	0.193	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
10.002	47.697	0.119	400.0	0.046	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.006	12.244	0.140	87.5	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.007	66.556	0.165	403.4	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.008	72.027	0.186	387.2	0.600	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.009	149.621	1.948	76.8	0.070	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.010	35.070	0.550	63.8	0.000	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
9.011	41.219	0.176	234.2	0.091	0.00	0.0	0.600	o	450	Pi pe/ Conduit	
1.011	25.916	0.144	180.0	0.095	0.00	0.0	0.600	o	525	Pi pe/ Conduit	
1.012	48.097	0.098	491.3	0.142	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.013	15.896	0.189	84.1	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.014	18.776	0.300	62.6	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
1.015	26.409	0.053	500.0	0.000	0.00	0.0	0.600	o	675	Pi pe/ Conduit	
Network Results Table											
PN	Rain (mm/hr)	T. C. (mins)	US/IL (m)	√ I. Area (ha)	√ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
10.001	50.00	6.67	7.446	0.223	0.0	0.0	0.0	1.01	160.7	30.2	
10.002	50.00	7.46	7.250	0.269	0.0	0.0	0.0	1.01	160.7	36.4	
9.006	50.00	7.55	6.790	0.597	0.0	0.0	0.0	2.17	345.9	80.8	
9.007	50.00	8.65	7.086	0.597	0.0	0.0	0.0	1.01	160.0	80.8	
9.008	50.00	9.82	6.921	1.197	0.0	0.0	0.0	1.03	163.3	162.1	
9.009	50.00	10.90	6.735	1.267	0.0	0.0	0.0	2.32	369.2	171.6	
9.010	50.00	11.12	4.787	1.267	0.0	0.0	0.0	2.55	405.5	171.6	
9.011	50.00	11.64	3.932	1.358	0.0	0.0	0.0	1.32	210.6	183.9	
1.011	50.00	11.90	3.681	2.479	0.0	0.0	0.0	1.67	360.8	335.7	
1.012	50.00	12.58	3.387	2.621	0.0	0.0	0.0	1.18	420.7	354.9	
1.013	50.00	12.68	3.289	2.621	0.0	0.0	0.0	2.86	1023.2	354.9	
1.014	50.00	12.77	3.100	2.621	0.0	0.0	0.0	3.32	1186.8	354.9	
1.015	50.00	13.15	2.800	2.621	0.0	0.0	0.0	1.17	417.0	354.9	
Free Flowing Outfall Details for Storm											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	M n I. Level (m)	D, L (mm)	W (mm)					
1.015	S-Outfall	5.000	2.747	1.000	0	0					
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10mE/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	12
Number of Online Controls	10	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.500	Storm Duration (mins)	30
Ratio R	0.333		

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Online Controls for Storm Orifice Manhole: 2, DS/PN: 1.001, Volume (mE): 4.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.378 Orifice Manhole: 18, DS/PN: 2.001, Volume (mE): 4.3 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.379 Orifice Manhole: 20, DS/PN: 3.001, Volume (mE): 3.9 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.340 Orifice Manhole: 24, DS/PN: 4.001, Volume (mE): 3.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.180 Orifice Manhole: 7, DS/PN: 1.006, Volume (mE): 5.9 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.092 Orifice Manhole: 29, DS/PN: 6.002, Volume (mE): 6.2 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 5.800 Orifice Manhole: 9, DS/PN: 1.008, Volume (mE): 10.5 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 4.812 Orifice Manhole: 40, DS/PN: 9.001, Volume (mE): 5.4 Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.473 Hydro-Brake÷ Optimum Manhole: 46, DS/PN: 9.007, Volume (mE): 3.6 <table><tr><td>Unit Reference</td><td>MD-SHE-0212-2500-1500-2500</td></tr><tr><td>Design Head (m)</td><td>1.500</td></tr><tr><td>Design Flow (l/s)</td><td>25.0</td></tr><tr><td>Flush-Flow</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>212</td></tr><tr><td>Invert Level (m)</td><td>7.086</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1800</td></tr></table> </			Unit Reference	MD-SHE-0212-2500-1500-2500	Design Head (m)	1.500	Design Flow (l/s)	25.0	Flush-Flow	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	212	Invert Level (m)	7.086	Minimum Outlet Pipe Diameter (mm)	225	Suggested Manhole Diameter (mm)	1800
Unit Reference	MD-SHE-0212-2500-1500-2500																							
Design Head (m)	1.500																							
Design Flow (l/s)	25.0																							
Flush-Flow	Calculated																							
Objective	Minimise upstream storage																							
Application	Surface																							
Sump Available	Yes																							
Diameter (mm)	212																							
Invert Level (m)	7.086																							
Minimum Outlet Pipe Diameter (mm)	225																							
Suggested Manhole Diameter (mm)	1800																							

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<u>Hydro- Brake÷ Optimum Manhole: 46, DS/PN: 9.007, Volume (mE): 3.6</u>					
Control Points		Head (m)	Flow (l/s)	Control Points	
Design Point (Calculated)		1.500	25.0	Kick-Flow	
Flush-Flow		0.455	25.0	Mean Flow over Head Range	
				1.000	20.6
				-	21.5
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake÷ Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum be utilised then these storage routing calculations will be invalidated					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	22.5	3.000	34.8
0.200	20.6	1.400	24.2	3.500	37.5
0.300	24.2	1.600	25.8	4.000	40.0
0.400	24.9	1.800	27.3	4.500	42.4
0.500	24.9	2.000	28.7	5.000	44.6
0.600	24.7	2.200	30.0	5.500	46.7
0.800	23.7	2.400	31.3	6.000	48.7
1.000	20.7	2.600	32.5	6.500	50.6
<u>Hydro- Brake÷ Optimum Manhole: 16, DS/PN: 1.015, Volume (mE): 11.8</u>					
Unit Reference MD-SHE-0199-2000-1000-2000					
Design Head (m) 1.000					
Design Flow (l/s) 20.0					
Flush-Flow Calculated					
Objective Minimise upstream storage					
Application Surface					
Sump Available Yes					
Diameter (mm) 199					
Invert Level (m) 2.800					
Minimum Outlet Pipe Diameter (mm) 225					
Suggested Manhole Diameter (mm) 1500					
Control Points		Head (m)	Flow (l/s)	Control Points	
Design Point (Calculated)		1.000	20.0	Kick-Flow	
Flush-Flow		0.340	20.0	Mean Flow over Head Range	
				0.721	17.1
				-	16.8
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake÷ Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum be utilised then these storage routing calculations will be invalidated					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.9	0.600	19.0	1.600	25.0
0.200	18.7	0.800	18.0	1.800	26.5
0.300	19.9	1.000	20.0	2.000	27.8
0.400	19.9	1.200	21.8	2.200	29.1
0.500	19.5	1.400	23.5	2.400	30.4
				4.000	38.9
				4.500	41.1
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Storage Structures for Storm

Complex Manhole: 1, DS/PN: 1.000

Cellular Storage

Invert Level (m) 7.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	187.0	0.0	1.151	187.0	0.0
1.150	187.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 5.3
Membrane Percolation (mm/hr) 1000 Length (m) 35.0
Max Percolation (l/s) 51.5 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 8.550 Membrane Depth (mm) 260

Complex Manhole: 17, DS/PN: 2.000

Cellular Storage

Invert Level (m) 7.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	316.0	0.0	1.150	316.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 13.5
Membrane Percolation (mm/hr) 1000 Length (m) 23.0
Max Percolation (l/s) 86.3 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 8.550 Membrane Depth (mm) 0

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Complex Manhole: 19, DS/PN: 3.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	56.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.359	Membrane Depth (mm)	260

Cellular Storage

Invert Level (m)	7.359	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	208.0	0.0	0.991	208.0	0.0

Complex Manhole: 23, DS/PN: 4.000

Cellular Storage

Invert Level (m)	7.189	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	219.0	0.0	1.291	219.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	31.0
Max Percolation (l/s)	60.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.480	Membrane Depth (mm)	260

Complex Manhole: 25, DS/PN: 5.000

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<u>Cellular Storage</u> Invert Level (m) 7.153 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>360.0</td> <td>0.0</td> <td>1.297</td> <td>360.0</td> <td>0.0</td> </tr> </tbody> </table> <u>Porous Car Park</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8 Membrane Percolation (mm/hr) 1000 Length (m) 75.0 Max Percolation (l/s) 100.0 Slope (1:X) 1000.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 8.450 Membrane Depth (mm) 260 <u>Complex Manhole: 28, DS/PN: 6.001</u> <u>Porous Car Park</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 7.0 Membrane Percolation (mm/hr) 1000 Length (m) 31.0 Max Percolation (l/s) 60.3 Slope (1:X) 1000.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 5.690 Membrane Depth (mm) 260 <u>Cellular Storage</u> Invert Level (m) 5.690 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>221.0</td> <td>0.0</td> <td>1.460</td> <td>221.0</td> <td>0.0</td> </tr> </tbody> </table> <u>Complex Manhole: 36, DS/PN: 8.000</u> <u>Cellular Storage</u> Invert Level (m) 6.600 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	360.0	0.0	1.297	360.0	0.0	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	221.0	0.0	1.460	221.0	0.0
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)																					
0.000	360.0	0.0	1.297	360.0	0.0																					
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)																					
0.000	221.0	0.0	1.460	221.0	0.0																					
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Cellular Storage

Depth (m)	Area (m ²)	Inf. Area (m ²)	
0.000	208.0	0.0	

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.0
Max Percolation (l/s)	57.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.750	Membrane Depth (mm)	260

Complex Manhole: 39, DS/PN: 9.000

Cellular Storage

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.0
Max Percolation (l/s)	57.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.750	Membrane Depth (mm)	260

Complex Manhole: 39, DS/PN: 9.000

Cellular Storage

Depth (m)	Area (m ²)	Inf. Area (m ²)	
0.000	180.0	0.0	

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	46.9	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.670	Membrane Depth (mm)	0

Tank or Pond Manhole: 45, DS/PN: 9.006

Invert Level (m) 7.127

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.4	1.500	217.0

Swale Manhole: 47, DS/PN: 9.008

Warning: - Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Infiltration Coefficient Side (m/hr)	0.00000
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<u>Swale Manhole: 47, DS/PN: 9.008</u> <table border="0"> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>4.0</td> </tr> <tr> <td>Porosity</td> <td>1.00</td> <td>Slope (1:X)</td> <td>750.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>8.480</td> <td>Cap Volume</td> <td>Depth (m) 0.000</td> </tr> <tr> <td>Base Width (m)</td> <td>1.0</td> <td>Cap Infiltration</td> <td>Depth (m) 0.000</td> </tr> <tr> <td>Length (m)</td> <td>65.0</td> <td>Include Swale Volume</td> <td>Yes</td> </tr> </table> <u>Porous Car Park Manhole: 50, DS/PN: 9.011</u> <table border="0"> <tr> <td>Infiltration Coefficient</td> <td>Base (m/hr)</td> <td>0.00000</td> <td>Width (m)</td> <td>8.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td></td> <td>1000</td> <td>Length (m)</td> <td>25.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td></td> <td>55.6</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td></td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td></td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td></td> <td>3.932</td> <td>Membrane Depth (mm)</td> <td>0</td> </tr> </table> <u>Tank or Pond Manhole: 15, DS/PN: 1.014</u> Invert Level (m) 3.500 <table border="0"> <tr> <td>Depth (m)</td> <td>Area (m²)</td> <td>Depth (m)</td> <td>Area (m²)</td> </tr> <tr> <td>0.000</td> <td>92.0</td> <td>1.600</td> <td>755.0</td> </tr> </table>			Safety Factor	2.0	Side Slope (1:X)	4.0	Porosity	1.00	Slope (1:X)	750.0	Invert Level (m)	8.480	Cap Volume	Depth (m) 0.000	Base Width (m)	1.0	Cap Infiltration	Depth (m) 0.000	Length (m)	65.0	Include Swale Volume	Yes	Infiltration Coefficient	Base (m/hr)	0.00000	Width (m)	8.0	Membrane Percolation (mm/hr)		1000	Length (m)	25.0	Max Percolation (l/s)		55.6	Slope (1:X)	0.0	Safety Factor		2.0	Depression Storage (mm)	5	Porosity		0.30	Evaporation (mm/day)	3	Invert Level (m)		3.932	Membrane Depth (mm)	0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	92.0	1.600	755.0
Safety Factor	2.0	Side Slope (1:X)	4.0																																																									
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Summary of Critical Results by Maximum Inflow (Rank 1) for Storm									
Simulation Criteria									
Areal Reduction Factor		1.000	Additional Flow - % of Total Flow		0.000				
Hot Start (mins)		0	MADD Factor * 10mE/ha Storage		2.000				
Hot Start Level (mm)		0	Inlet Coefficient		0.800				
Manhole Headloss Coeff (Global)		0.500	Flow per Person per Day (l/per/day)		0.000				
Foul Sewage per hectare (l/s)		0.000							
Number of Input Hydrographs		0	Number of Storage Structures		12				
Number of Online Controls		10	Number of Time/Area Diagrams		0				
Number of Offline Controls		0	Number of Real Time Controls		0				
Synthetic Rainfall Details									
Rainfall Model		FSR	Ratio R		0.336				
Region England and Wales		Cv (Summer)	0.750						
M5-60 (mm)		19.400	Cv (Winter)		0.840				
Margin for Flood Risk Warning (mm)					300.0				
Analysis Timestep		2.5	Second Increment (Extended)						
DTS Status					ON				
DVD Status					ON				
Inertia Status					ON				
Profile(s)					Summer and Winter				
Duration(s) (mins)		15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080							
Return Period(s) (years)					100				
Climate Change (%)					40				
Water									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
1.000	1	15 Winter	100	+40%					7.433
1.001	2	60 Winter	100	+40%					7.451
2.000	17	15 Winter	100	+40%					7.441
2.001	18	60 Winter	100	+40%					7.465
1.002	3	60 Winter	100	+40%					7.637
1.003	4	60 Winter	100	+40%					7.636
3.000	19	15 Winter	100	+40%					7.462
3.001	20	60 Winter	100	+40%					7.514
3.002	21	15 Winter	100	+40%					7.703
3.003	22	15 Summer	100	+40%					7.646
1.004	5	15 Summer	100	+40%					7.594
4.000	23	15 Winter	100	+40%					7.232
4.001	24	60 Winter	100	+40%					7.346
1.005	6	15 Summer	100	+40%					7.542
5.000	25	15 Winter	100	+40%					7.270
5.001	26	360 Winter	100	+40%					7.394
1.006	7	15 Summer	100	+40%					7.507
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<u>Summary of Critical Results by Maximum Inflow (Rank 1) for Storm</u>								
PN	US/ MH Name	Surcharged Depth (m)	Flooded Volume (mE)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.417	0.000	0.02		1.2	OK	
1.001	2	-0.377	0.000	0.03		2.4	OK	
2.000	17	-0.409	0.000	0.02		1.4	OK	
2.001	18	-0.364	0.000	0.05		3.6	OK	
1.002	3	-0.168	0.000	0.08		7.7	OK	
1.003	4	-0.149	0.000	0.04		8.4	OK	
3.000	19	-0.347	0.000	0.12		8.6	OK	
3.001	20	-0.276	0.000	0.12		9.1	OK	
3.002	21	-0.067	0.000	0.37		39.0	OK	
3.003	22	-0.088	0.000	0.35		47.9	OK	
1.004	5	-0.073	0.000	0.28		39.7	OK	
4.000	23	-0.407	0.000	0.02		2.2	OK	
4.001	24	-0.283	0.000	0.07		7.5	OK	
1.005	6	-0.042	0.000	0.29		33.5	OK	
5.000	25	-0.333	0.000	0.03		3.6	OK	
5.001	26	-0.201	0.000	0.04		4.7	OK	
1.006	7	-0.035	0.000	0.02		12.4	OK	
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Summary of Critical Results by Maximum Inflow (Rank 1) for Storm									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
6.000	27	15 W nter	100	+40%					
6.001	28	15 W nter	100	+40%					
6.002	29	180 W nter	100	+40%	100/180 W nter				
6.003	30	180 W nter	100	+40%	100/15 Summer	100/60 W nter			
6.004	31	15 Summer	100	+40%	100/15 Summer				
6.005	32	15 W nter	100	+40%	100/15 Summer				
1.007	8	15 Summer	100	+40%	100/15 Summer				
7.000	33	15 W nter	100	+40%					
8.000	36	360 W nter	100	+40%	100/60 W nter				
8.001	37	15 Summer	100	+40%	100/15 Summer	100/15 Summer			
8.002	38	15 Summer	100	+40%	100/15 Summer				
7.001	34	15 W nter	100	+40%	100/15 Summer				
7.002	35	15 W nter	100	+40%	100/15 Summer				
1.008	9	15 W nter	100	+40%	100/15 Summer				
1.009	10	60 W nter	100	+40%	100/120 Summer				
1.010	11	60 W nter	100	+40%	100/60 Summer				
9.000	39	15 W nter	100	+40%	100/60 W nter				
9.001	40	120 W nter	100	+40%	100/60 W nter				
9.002	41	15 Summer	100	+40%	100/15 Summer				
9.003	42	15 Summer	100	+40%	100/15 Summer				
9.004	43	15 W nter	100	+40%	100/15 Summer				
9.005	44	30 Summer	100	+40%	100/15 Summer				
10.000	51	15 W nter	100	+40%	100/15 Summer				
10.001	52	15 Summer	100	+40%	100/15 Summer				
10.002	53	15 W nter	100	+40%	100/15 Summer				
9.006	45	15 W nter	100	+40%	100/15 Summer				
9.007	46	60 W nter	100	+40%	100/15 Summer	100/60 W nter			
9.008	47	15 W nter	100	+40%	100/15 Summer				
9.009	48	15 W nter	100	+40%					
9.010	19	30 W nter	100	+40%	100/60 W nter				
9.011	50	30 W nter	100	+40%	100/15 Summer				
1.011	12	15 W nter	100	+40%	100/15 Summer	100/240 W nter			
1.012	13	30 W nter	100	+40%	100/15 Summer				
1.013	14	30 W nter	100	+40%	100/15 Summer				
1.014	15	30 W nter	100	+40%	100/15 Summer				
1.015	16	15 W nter	100	+40%	100/15 Summer				
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
6.000	27	7.132	-0.328	0.000	0.16		93.3	OK	
6.001	28	5.921	-0.519	0.000	0.00		0.0	OK	
6.002	29	6.309	0.059	0.000	0.05		7.4	SURCHARGED	
6.003	30	7.091	0.964	0.000	0.06		8.1	SURCHARGED	1
6.004	31	7.070	1.031	0.000	0.14		15.7	SURCHARGED	
6.005	32	7.289	1.295	0.000	0.11		19.0	SURCHARGED	
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PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (mE)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.007	8	7.096	1.203	0.000	0.04		19.9	SURCHARGED	
7.000	33	7.505	-0.345	0.000	0.12		36.8	OK	
8.000	36	6.630	-0.070	0.000	0.17		1.2	OK	
8.001	37	7.901	1.454	0.666	0.80		6.2	FLOOD	4
8.002	38	8.429	2.469	0.000	1.73		30.2	SURCHARGED	
7.001	34	7.331	1.915	0.000	0.62		85.1	SURCHARGED	
7.002	35	7.317	1.978	0.000	0.53		72.9	SURCHARGED	
1.008	9	7.303	2.041	0.000	0.22		30.7	SURCHARGED	
1.009	10	5.166	0.000	0.000	0.23		32.9	OK	
1.010	11	5.149	0.085	0.000	0.10		38.8	SURCHARGED	
9.000	39	7.769	-0.201	0.000	0.04		5.1	OK	
9.001	40	8.120	0.197	0.000	0.10		12.0	SURCHARGED	
9.002	41	8.136	0.259	0.000	0.18		18.4	SURCHARGED	
9.003	42	8.139	0.296	0.000	0.43		61.0	SURCHARGED	
9.004	43	8.272	0.528	0.000	0.26		77.6	SURCHARGED	
9.005	44	8.286	0.986	0.000	0.56		75.2	FLOOD RISK	
10.000	51	8.263	0.313	0.000	0.11		14.4	SURCHARGED	
10.001	52	8.162	0.266	0.000	0.69		103.9	SURCHARGED	
10.002	53	8.255	0.555	0.000	0.70		102.1	SURCHARGED	
9.006	45	8.246	1.006	0.000	0.13		27.9	FLOOD RISK	
9.007	46	8.402	0.866	1.885	0.17		24.9	FLOOD	1
9.008	47	7.796	0.425	0.000	1.73		263.5	SURCHARGED	
9.009	48	7.044	-0.141	0.000	0.78		277.0	OK	
9.010	19	5.089	-0.148	0.000	0.78		278.0	OK	
9.011	50	4.904	0.522	0.000	1.16		218.8	SURCHARGED	
1.011	12	4.696	0.490	0.000	0.89		258.2	SURCHARGED	7
1.012	13	4.754	0.692	0.000	0.80		289.3	SURCHARGED	
1.013	14	4.747	0.782	0.000	0.52		287.5	SURCHARGED	
1.014	15	4.602	0.827	0.000	0.07		47.4	SURCHARGED	
1.015	16	4.445	0.970	0.000	0.08		24.8	SURCHARGED	
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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1	3.907	11	24.867	21	68.989	31	138.233	41	61.269	51	24.495
2	11.232	12	25.666	22	78.273	32	134.350	42	54.125	52	24.439
3	16.611	13	27.288	23	86.878	33	128.966	43	46.962	53	24.491
4	20.585	14	29.491	24	95.613	34	121.374	44	41.454	54	24.425
5	22.693	15	32.419	25	105.350	35	113.643	45	36.718	55	23.894
6	23.894	16	36.718	26	113.643	36	105.350	46	32.419	56	22.694
7	24.425	17	41.454	27	121.374	37	95.613	47	29.491	57	20.584
8	24.490	18	46.962	28	128.966	38	86.878	48	27.288	58	16.611
9	24.439	19	54.125	29	134.350	39	78.273	49	25.666	59	11.232
10	24.495	20	61.269	30	138.233	40	68.989	50	24.867	60	3.906
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4	20.585	14	29.491	24	95.613	34	121.374	44	41.454	54	24.425
5	22.693	15	32.419	25	105.350	35	113.643	45	36.718	55	23.894
6	23.894	16	36.718	26	113.643	36	105.350	46	32.419	56	22.694
7	24.425	17	41.454	27	121.374	37	95.613	47	29.491	57	20.584
8	24.490	18	46.962	28	128.966	38	86.878	48	27.288	58	16.611
9	24.439	19	54.125	29	134.350	39	78.273	49	25.666	59	11.232
10	24.495	20	61.269	30	138.233	40	68.989	50	24.867	60	3.906
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	3.907	11	24.867	21	68.989	31	138.233	41	61.269	51	24.495
2	11.232	12	25.666	22	78.273	32	134.350	42	54.125	52	24.439
3	16.611	13	27.288	23	86.878	33	128.966	43	46.962	53	24.491
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
2	54.613	5	116.548	8	311.751	11	116.548	14	54.613																																				
3	56.880	6	188.569	9	268.386	12	72.004	15	29.927																																				
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Landmark House Station Road, Hook Hampshire RG27 9HA											
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC					Designed by Scott Collis Checked by						
Innovyze					Network 2019.1						
<u>Rainfall Hyetograph for 360 minute 100 year Winter I+40%</u> <u>for Pipe 5.001 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	0.500	49	6.770	97	10.614	145	28.571	193	36.324	241	18.267
2	0.500	50	6.770	98	11.288	146	28.571	194	36.324	242	17.210
3	0.500	51	6.764	99	11.456	147	28.571	195	35.696	243	16.945
4	1.081	52	6.761	100	11.456	148	29.160	196	35.278	244	16.945
5	1.953	53	6.761	101	11.642	149	30.043	197	35.278	245	16.694
6	1.953	54	6.761	102	12.388	150	30.043	198	35.278	246	15.690
7	1.953	55	6.766	103	12.388	151	30.043	199	34.105	247	15.690
8	2.914	56	6.766	104	12.388	152	31.183	200	34.105	248	15.690
9	3.154	57	6.766	105	12.999	153	31.468	201	34.105	249	14.981
10	3.154	58	6.780	106	13.406	154	31.468	202	33.595	250	14.509
11	3.349	59	6.800	107	13.406	155	31.740	203	32.829	251	14.509
12	4.131	60	6.800	108	13.406	156	32.829	204	32.829	252	14.509
13	4.131	61	6.800	109	14.509	157	32.829	205	32.829	253	13.406
14	4.131	62	6.858	110	14.509	158	32.829	206	31.740	254	13.406
15	4.598	63	6.873	111	14.509	159	33.595	207	31.468	255	13.406
16	4.909	64	6.873	112	14.981	160	34.105	208	31.468	256	12.999
17	4.909	65	6.898	113	15.690	161	34.105	209	31.183	257	12.388
18	4.909	66	6.995	114	15.690	162	34.105	210	30.043	258	12.388
19	5.515	67	6.995	115	15.690	163	35.278	211	30.043	259	12.388
20	5.515	68	6.995	116	16.694	164	35.278	212	30.043	260	11.642
21	5.515	69	7.104	117	16.945	165	35.278	213	29.160	261	11.456
22	5.698	70	7.177	118	16.945	166	35.696	214	28.571	262	11.456
23	5.972	71	7.177	119	17.210	167	36.324	215	28.571	263	11.288
24	5.972	72	7.177	120	18.267	168	36.324	216	28.571	264	10.614
25	5.972	73	7.424	121	18.267	169	36.324	217	27.070	265	10.614
26	6.236	74	7.424	122	18.267	170	37.042	218	27.070	266	10.614
27	6.302	75	7.424	123	19.095	171	37.221	219	27.070	267	10.163
28	6.302	76	7.553	124	19.648	172	37.221	220	26.465	268	9.862
29	6.347	77	7.746	125	19.648	173	37.366	221	25.556	269	9.862
30	6.528	78	7.746	126	19.648	174	37.945	222	25.556	270	9.862
31	6.528	79	7.746	127	21.077	175	37.945	223	25.556	271	9.202
32	6.528	80	8.066	128	21.077	176	37.945	224	24.346	272	9.202
33	6.614	81	8.146	129	21.077	177	38.261	225	24.044	273	9.202
34	6.670	82	8.146	130	21.665	178	38.472	226	24.044	274	8.973
35	6.670	83	8.243	131	22.547	179	38.472	227	23.744	275	8.630
36	6.670	84	8.630	132	22.547	180	38.472	228	22.547	276	8.630
37	6.748	85	8.630	133	22.547	181	38.472	229	22.547	277	8.630
38	6.748	86	8.630	134	23.744	182	38.472	230	22.547	278	8.243
39	6.748	87	8.973	135	24.044	183	38.472	231	21.665	279	8.146
40	6.760	88	9.202	136	24.044	184	38.261	232	21.077	280	8.146
41	6.779	89	9.202	137	24.346	185	37.945	233	21.077	281	8.066
42	6.779	90	9.202	138	25.556	186	37.945	234	21.077	282	7.746
43	6.779	91	9.862	139	25.556	187	37.945	235	19.648	283	7.746
44	6.781	92	9.862	140	25.556	188	37.366	236	19.648	284	7.746
45	6.781	93	9.862	141	26.465	189	37.221	237	19.648	285	7.553
46	6.781	94	10.163	142	27.070	190	37.221	238	19.095	286	7.424
47	6.779	95	10.614	143	27.070	191	37.042	239	18.267	287	7.424
48	6.770	96	10.614	144	27.070	192	36.324	240	18.267	288	7.424
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<u>Rainfall Hyetograph for 360 minute 100 year Winter I+40%</u> <u>for Pipe 5.001 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
289	7.177	301	6.800	313	6.770	325	6.670	337	5.972	349	4.130
290	7.177	302	6.800	314	6.779	326	6.670	338	5.972	350	3.349
291	7.177	303	6.780	315	6.781	327	6.670	339	5.697	351	3.154
292	7.104	304	6.766	316	6.781	328	6.613	340	5.515	352	3.154
293	6.996	305	6.766	317	6.781	329	6.528	341	5.515	353	2.914
294	6.996	306	6.766	318	6.779	330	6.528	342	5.515	354	1.953
295	6.996	307	6.761	319	6.779	331	6.528	343	4.909	355	1.953
296	6.897	308	6.761	320	6.779	332	6.347	344	4.909	356	1.953
297	6.873	309	6.761	321	6.760	333	6.302	345	4.909	357	1.081
298	6.873	310	6.765	322	6.748	334	6.302	346	4.598	358	0.500
299	6.858	311	6.770	323	6.748	335	6.236	347	4.130	359	0.500
300	6.800	312	6.770	324	6.748	336	5.972	348	4.130	360	0.500
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Landmark House Station Road, Hook Hampshire RG27 9HA																																													
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC		Designed by Scott Collis Checked by																																											
Innovyze		Network 2019.1																																											
<u>Rainfall Hyetograph for 15 minute 100 year Summer I+40%</u> <u>for Pipe 1.006 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>42.300</td><td>4</td><td>63.608</td><td>7</td><td>286.235</td><td>10</td><td>144.626</td><td>13</td><td>52.986</td></tr><tr><td>2</td><td>46.512</td><td>5</td><td>84.412</td><td>8</td><td>444.249</td><td>11</td><td>84.412</td><td>14</td><td>46.512</td></tr><tr><td>3</td><td>52.986</td><td>6</td><td>144.626</td><td>9</td><td>286.235</td><td>12</td><td>63.608</td><td>15</td><td>42.300</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	42.300	4	63.608	7	286.235	10	144.626	13	52.986	2	46.512	5	84.412	8	444.249	11	84.412	14	46.512	3	52.986	6	144.626	9	286.235	12	63.608	15	42.300
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	42.300	4	63.608	7	286.235	10	144.626	13	52.986																																				
2	46.512	5	84.412	8	444.249	11	84.412	14	46.512																																				
3	52.986	6	144.626	9	286.235	12	63.608	15	42.300																																				
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Landmark House Station Road, Hook Hampshire RG27 9HA																																													
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Innovyze		Network 2019.1																																											
<u>Rainfall Hyetograph for 15 minute 100 year Winter I+40%</u> <u>for Pipe 6.000 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>29.928</td><td>4</td><td>72.004</td><td>7</td><td>268.386</td><td>10</td><td>188.569</td><td>13</td><td>56.880</td></tr><tr><td>2</td><td>54.613</td><td>5</td><td>116.548</td><td>8</td><td>311.751</td><td>11</td><td>116.548</td><td>14</td><td>54.613</td></tr><tr><td>3</td><td>56.880</td><td>6</td><td>188.569</td><td>9</td><td>268.386</td><td>12</td><td>72.004</td><td>15</td><td>29.927</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	29.928	4	72.004	7	268.386	10	188.569	13	56.880	2	54.613	5	116.548	8	311.751	11	116.548	14	54.613	3	56.880	6	188.569	9	268.386	12	72.004	15	29.927
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
2	54.613	5	116.548	8	311.751	11	116.548	14	54.613																																				
3	56.880	6	188.569	9	268.386	12	72.004	15	29.927																																				
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Landmark House Station Road, Hook Hampshire RG27 9HA																																													
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC		Designed by Scott Collis Checked by																																											
Innovyze		Network 2019.1																																											
<u>Rainfall Hyetograph for 15 minute 100 year Winter I+40%</u> <u>for Pipe 6.001 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>29.928</td><td>4</td><td>72.004</td><td>7</td><td>268.386</td><td>10</td><td>188.569</td><td>13</td><td>56.880</td></tr><tr><td>2</td><td>54.613</td><td>5</td><td>116.548</td><td>8</td><td>311.751</td><td>11</td><td>116.548</td><td>14</td><td>54.613</td></tr><tr><td>3</td><td>56.880</td><td>6</td><td>188.569</td><td>9</td><td>268.386</td><td>12</td><td>72.004</td><td>15</td><td>29.927</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	29.928	4	72.004	7	268.386	10	188.569	13	56.880	2	54.613	5	116.548	8	311.751	11	116.548	14	54.613	3	56.880	6	188.569	9	268.386	12	72.004	15	29.927
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
2	54.613	5	116.548	8	311.751	11	116.548	14	54.613																																				
3	56.880	6	188.569	9	268.386	12	72.004	15	29.927																																				
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Landmark House Station Road, Hook Hampshire RG27 9HA						Designed by Scott Collis Checked by					
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC											
Innovyze						Network 2019.1					
<u>Rainfall Hyetograph for 180 minute 100 year Winter I+40%</u> <u>for Pipe 6.002 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	0.840	31	11.470	61	30.679	91	64.612	121	29.791	151	11.421
2	1.328	32	11.543	62	32.534	92	64.435	122	28.459	152	11.375
3	3.280	33	11.666	63	32.998	93	63.728	123	27.194	153	11.364
4	4.087	34	11.749	64	35.399	94	63.242	124	26.351	154	11.354
5	5.297	35	11.992	65	35.893	95	62.512	125	24.764	155	11.358
6	6.281	36	12.053	66	37.867	96	61.608	126	24.367	156	11.370
7	6.937	37	12.469	67	38.872	97	61.005	127	22.515	157	11.378
8	7.983	38	12.577	68	40.381	98	59.599	128	22.173	158	11.389
9	8.245	39	13.009	69	41.905	99	59.248	129	20.804	159	11.387
10	9.262	40	13.278	70	42.921	100	57.279	130	20.179	160	11.386
11	9.415	41	13.681	71	44.955	101	56.850	131	19.240	161	11.343
12	10.029	42	14.169	72	45.464	102	55.135	132	18.391	162	11.333
13	10.251	43	14.494	73	47.984	103	54.221	133	17.826	163	11.203
14	10.584	44	15.262	74	48.479	104	52.849	134	16.816	164	11.155
15	10.812	45	15.454	75	50.456	105	51.413	135	16.564	165	10.964
16	10.964	46	16.564	76	51.413	106	50.456	136	15.454	166	10.812
17	11.155	47	16.816	77	52.849	107	48.479	137	15.262	167	10.584
18	11.203	48	17.826	78	54.221	108	47.984	138	14.494	168	10.251
19	11.333	49	18.391	79	55.135	109	45.464	139	14.169	169	10.029
20	11.343	50	19.240	80	56.850	110	44.955	140	13.681	170	9.415
21	11.385	51	20.179	81	57.279	111	42.921	141	13.278	171	9.262
22	11.387	52	20.804	82	59.248	112	41.905	142	13.009	172	8.245
23	11.389	53	22.173	83	59.599	113	40.381	143	12.577	173	7.983
24	11.378	54	22.515	84	61.005	114	38.872	144	12.469	174	6.937
25	11.370	55	24.367	85	61.608	115	37.867	145	12.053	175	6.281
26	11.358	56	24.764	86	62.512	116	35.893	146	11.992	176	5.297
27	11.354	57	26.351	87	63.242	117	35.399	147	11.749	177	4.087
28	11.364	58	27.194	88	63.728	118	32.998	148	11.666	178	3.280
29	11.375	59	28.459	89	64.435	119	32.534	149	11.543	179	1.328
30	11.421	60	29.791	90	64.612	120	30.679	150	11.470	180	0.840
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Landmark House Station Road, Hook Hampshire RG27 9HA						Designed by Scott Collis Checked by					
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC											
Innovyze						Network 2019.1					
<u>Rainfall Hyetograph for 180 minute 100 year Winter I+40%</u> <u>for Pipe 6.003 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	0.840	31	11.470	61	30.679	91	64.612	121	29.791	151	11.421
2	1.328	32	11.543	62	32.534	92	64.435	122	28.459	152	11.375
3	3.280	33	11.666	63	32.998	93	63.728	123	27.194	153	11.364
4	4.087	34	11.749	64	35.399	94	63.242	124	26.351	154	11.354
5	5.297	35	11.992	65	35.893	95	62.512	125	24.764	155	11.358
6	6.281	36	12.053	66	37.867	96	61.608	126	24.367	156	11.370
7	6.937	37	12.469	67	38.872	97	61.005	127	22.515	157	11.378
8	7.983	38	12.577	68	40.381	98	59.599	128	22.173	158	11.389
9	8.245	39	13.009	69	41.905	99	59.248	129	20.804	159	11.387
10	9.262	40	13.278	70	42.921	100	57.279	130	20.179	160	11.386
11	9.415	41	13.681	71	44.955	101	56.850	131	19.240	161	11.343
12	10.029	42	14.169	72	45.464	102	55.135	132	18.391	162	11.333
13	10.251	43	14.494	73	47.984	103	54.221	133	17.826	163	11.203
14	10.584	44	15.262	74	48.479	104	52.849	134	16.816	164	11.155
15	10.812	45	15.454	75	50.456	105	51.413	135	16.564	165	10.964
16	10.964	46	16.564	76	51.413	106	50.456	136	15.454	166	10.812
17	11.155	47	16.816	77	52.849	107	48.479	137	15.262	167	10.584
18	11.203	48	17.826	78	54.221	108	47.984	138	14.494	168	10.251
19	11.333	49	18.391	79	55.135	109	45.464	139	14.169	169	10.029
20	11.343	50	19.240	80	56.850	110	44.955	140	13.681	170	9.415
21	11.385	51	20.179	81	57.279	111	42.921	141	13.278	171	9.262
22	11.387	52	20.804	82	59.248	112	41.905	142	13.009	172	8.245
23	11.389	53	22.173	83	59.599	113	40.381	143	12.577	173	7.983
24	11.378	54	22.515	84	61.005	114	38.872	144	12.469	174	6.937
25	11.370	55	24.367	85	61.608	115	37.867	145	12.053	175	6.281
26	11.358	56	24.764	86	62.512	116	35.893	146	11.992	176	5.297
27	11.354	57	26.351	87	63.242	117	35.399	147	11.749	177	4.087
28	11.364	58	27.194	88	63.728	118	32.998	148	11.666	178	3.280
29	11.375	59	28.459	89	64.435	119	32.534	149	11.543	179	1.328
30	11.421	60	29.791	90	64.612	120	30.679	150	11.470	180	0.840
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Landmark House Station Road, Hook Hampshire RG27 9HA																																													
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<u>Rainfall Hyetograph for 15 minute 100 year Summer I+40%</u> <u>for Pipe 6.004 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>42.300</td><td>4</td><td>63.608</td><td>7</td><td>286.235</td><td>10</td><td>144.626</td><td>13</td><td>52.986</td></tr><tr><td>2</td><td>46.512</td><td>5</td><td>84.412</td><td>8</td><td>444.249</td><td>11</td><td>84.412</td><td>14</td><td>46.512</td></tr><tr><td>3</td><td>52.986</td><td>6</td><td>144.626</td><td>9</td><td>286.235</td><td>12</td><td>63.608</td><td>15</td><td>42.300</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	42.300	4	63.608	7	286.235	10	144.626	13	52.986	2	46.512	5	84.412	8	444.249	11	84.412	14	46.512	3	52.986	6	144.626	9	286.235	12	63.608	15	42.300
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
2	54.613	5	116.548	8	311.751	11	116.548	14	54.613																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
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1	0.500	49	6.770	97	10.614	145	28.571	193	36.324	241	18.267
2	0.500	50	6.770	98	11.288	146	28.571	194	36.324	242	17.210
3	0.500	51	6.764	99	11.456	147	28.571	195	35.696	243	16.945
4	1.081	52	6.761	100	11.456	148	29.160	196	35.278	244	16.945
5	1.953	53	6.761	101	11.642	149	30.043	197	35.278	245	16.694
6	1.953	54	6.761	102	12.388	150	30.043	198	35.278	246	15.690
7	1.953	55	6.766	103	12.388	151	30.043	199	34.105	247	15.690
8	2.914	56	6.766	104	12.388	152	31.183	200	34.105	248	15.690
9	3.154	57	6.766	105	12.999	153	31.468	201	34.105	249	14.981
10	3.154	58	6.780	106	13.406	154	31.468	202	33.595	250	14.509
11	3.349	59	6.800	107	13.406	155	31.740	203	32.829	251	14.509
12	4.131	60	6.800	108	13.406	156	32.829	204	32.829	252	14.509
13	4.131	61	6.800	109	14.509	157	32.829	205	32.829	253	13.406
14	4.131	62	6.858	110	14.509	158	32.829	206	31.740	254	13.406
15	4.598	63	6.873	111	14.509	159	33.595	207	31.468	255	13.406
16	4.909	64	6.873	112	14.981	160	34.105	208	31.468	256	12.999
17	4.909	65	6.898	113	15.690	161	34.105	209	31.183	257	12.388
18	4.909	66	6.995	114	15.690	162	34.105	210	30.043	258	12.388
19	5.515	67	6.995	115	15.690	163	35.278	211	30.043	259	12.388
20	5.515	68	6.995	116	16.694	164	35.278	212	30.043	260	11.642
21	5.515	69	7.104	117	16.945	165	35.278	213	29.160	261	11.456
22	5.698	70	7.177	118	16.945	166	35.696	214	28.571	262	11.456
23	5.972	71	7.177	119	17.210	167	36.324	215	28.571	263	11.288
24	5.972	72	7.177	120	18.267	168	36.324	216	28.571	264	10.614
25	5.972	73	7.424	121	18.267	169	36.324	217	27.070	265	10.614
26	6.236	74	7.424	122	18.267	170	37.042	218	27.070	266	10.614
27	6.302	75	7.424	123	19.095	171	37.221	219	27.070	267	10.163
28	6.302	76	7.553	124	19.648	172	37.221	220	26.465	268	9.862
29	6.347	77	7.746	125	19.648	173	37.366	221	25.556	269	9.862
30	6.528	78	7.746	126	19.648	174	37.945	222	25.556	270	9.862
31	6.528	79	7.746	127	21.077	175	37.945	223	25.556	271	9.202
32	6.528	80	8.066	128	21.077	176	37.945	224	24.346	272	9.202
33	6.614	81	8.146	129	21.077	177	38.261	225	24.044	273	9.202
34	6.670	82	8.146	130	21.665	178	38.472	226	24.044	274	8.973
35	6.670	83	8.243	131	22.547	179	38.472	227	23.744	275	8.630
36	6.670	84	8.630	132	22.547	180	38.472	228	22.547	276	8.630
37	6.748	85	8.630	133	22.547	181	38.472	229	22.547	277	8.630
38	6.748	86	8.630	134	23.744	182	38.472	230	22.547	278	8.243
39	6.748	87	8.973	135	24.044	183	38.472	231	21.665	279	8.146
40	6.760	88	9.202	136	24.044	184	38.261	232	21.077	280	8.146
41	6.779	89	9.202	137	24.346	185	37.945	233	21.077	281	8.066
42	6.779	90	9.202	138	25.556	186	37.945	234	21.077	282	7.746
43	6.779	91	9.862	139	25.556	187	37.945	235	19.648	283	7.746
44	6.781	92	9.862	140	25.556	188	37.366	236	19.648	284	7.746
45	6.781	93	9.862	141	26.465	189	37.221	237	19.648	285	7.553
46	6.781	94	10.163	142	27.070	190	37.221	238	19.095	286	7.424
47	6.779	95	10.614	143	27.070	191	37.042	239	18.267	287	7.424
48	6.770	96	10.614	144	27.070	192	36.324	240	18.267	288	7.424
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289	7.177	301	6.800	313	6.770	325	6.670	337	5.972	349	4.130
290	7.177	302	6.800	314	6.779	326	6.670	338	5.972	350	3.349
291	7.177	303	6.780	315	6.781	327	6.670	339	5.697	351	3.154
292	7.104	304	6.766	316	6.781	328	6.613	340	5.515	352	3.154
293	6.996	305	6.766	317	6.781	329	6.528	341	5.515	353	2.914
294	6.996	306	6.766	318	6.779	330	6.528	342	5.515	354	1.953
295	6.996	307	6.761	319	6.779	331	6.528	343	4.909	355	1.953
296	6.897	308	6.761	320	6.779	332	6.347	344	4.909	356	1.953
297	6.873	309	6.761	321	6.760	333	6.302	345	4.909	357	1.081
298	6.873	310	6.765	322	6.748	334	6.302	346	4.598	358	0.500
299	6.858	311	6.770	323	6.748	335	6.236	347	4.130	359	0.500
300	6.800	312	6.770	324	6.748	336	5.972	348	4.130	360	0.500
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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<u>Rainfall Hyetograph for 60 minute 100 year Winter I+40%</u> <u>for Pipe 1.009 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	3.907	11	24.867	21	68.989	31	138.233	41	61.269	51	24.495
2	11.232	12	25.666	22	78.273	32	134.350	42	54.125	52	24.439
3	16.611	13	27.288	23	86.878	33	128.966	43	46.962	53	24.491
4	20.585	14	29.491	24	95.613	34	121.374	44	41.454	54	24.425
5	22.693	15	32.419	25	105.350	35	113.643	45	36.718	55	23.894
6	23.894	16	36.718	26	113.643	36	105.350	46	32.419	56	22.694
7	24.425	17	41.454	27	121.374	37	95.613	47	29.491	57	20.584
8	24.490	18	46.962	28	128.966	38	86.878	48	27.288	58	16.611
9	24.439	19	54.125	29	134.350	39	78.273	49	25.666	59	11.232
10	24.495	20	61.269	30	138.233	40	68.989	50	24.867	60	3.906
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Landmark House Station Road, Hook Hampshire RG27 9HA											
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1	3.907	11	24.867	21	68.989	31	138.233	41	61.269	51	24.495
2	11.232	12	25.666	22	78.273	32	134.350	42	54.125	52	24.439
3	16.611	13	27.288	23	86.878	33	128.966	43	46.962	53	24.491
4	20.585	14	29.491	24	95.613	34	121.374	44	41.454	54	24.425
5	22.693	15	32.419	25	105.350	35	113.643	45	36.718	55	23.894
6	23.894	16	36.718	26	113.643	36	105.350	46	32.419	56	22.694
7	24.425	17	41.454	27	121.374	37	95.613	47	29.491	57	20.584
8	24.490	18	46.962	28	128.966	38	86.878	48	27.288	58	16.611
9	24.439	19	54.125	29	134.350	39	78.273	49	25.666	59	11.232
10	24.495	20	61.269	30	138.233	40	68.989	50	24.867	60	3.906
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	1.126	21	15.405	41	41.740	61	86.598	81	39.333	101	15.292
2	3.742	22	15.581	42	44.226	62	85.650	82	37.013	102	15.231
3	6.018	23	15.828	43	47.445	63	84.435	83	34.786	103	15.218
4	7.979	24	16.154	44	50.090	64	82.975	84	32.658	104	15.235
5	9.648	25	16.712	45	52.774	65	81.293	85	30.177	105	15.255
6	11.050	26	17.290	46	55.483	66	79.409	86	28.342	106	15.263
7	12.414	27	17.976	47	58.208	67	76.770	87	26.626	107	15.246
8	13.236	28	18.772	48	60.934	68	74.471	88	25.029	108	15.189
9	13.888	29	19.684	49	64.312	69	72.058	89	23.553	109	15.015
10	14.389	30	20.713	50	66.962	70	69.550	90	22.200	110	14.759
11	14.759	31	22.200	51	69.550	71	66.962	91	20.713	111	14.390
12	15.015	32	23.553	52	72.058	72	64.312	92	19.683	112	13.888
13	15.189	33	25.029	53	74.471	73	60.934	93	18.772	113	13.236
14	15.246	34	26.626	54	76.770	74	58.208	94	17.976	114	12.413
15	15.263	35	28.342	55	79.409	75	55.484	95	17.290	115	11.051
16	15.254	36	30.177	56	81.293	76	52.774	96	16.712	116	9.648
17	15.235	37	32.658	57	82.975	77	50.090	97	16.154	117	7.979
18	15.218	38	34.786	58	84.435	78	47.445	98	15.828	118	6.018
19	15.231	39	37.013	59	85.650	79	44.226	99	15.581	119	3.742
20	15.292	40	39.333	60	86.598	80	41.740	100	15.405	120	1.126
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	27.904	6	37.263	11	81.501	16	300.652	21	62.785	26	34.455
2	29.351	7	40.836	12	114.255	17	223.575	22	51.470	27	32.158
3	30.797	8	45.260	13	163.853	18	163.853	23	45.259	28	30.797
4	32.158	9	51.470	14	223.575	19	114.255	24	40.836	29	29.350
5	34.455	10	62.785	15	300.652	20	81.501	25	37.263	30	27.904

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<u>Rainfall Hyetograph for 15 minute 100 year Winter I+40%</u> <u>for Pipe 10.000 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>29.928</td><td>4</td><td>72.004</td><td>7</td><td>268.386</td><td>10</td><td>188.569</td><td>13</td><td>56.880</td></tr><tr><td>2</td><td>54.613</td><td>5</td><td>116.548</td><td>8</td><td>311.751</td><td>11</td><td>116.548</td><td>14</td><td>54.613</td></tr><tr><td>3</td><td>56.880</td><td>6</td><td>188.569</td><td>9</td><td>268.386</td><td>12</td><td>72.004</td><td>15</td><td>29.927</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	29.928	4	72.004	7	268.386	10	188.569	13	56.880	2	54.613	5	116.548	8	311.751	11	116.548	14	54.613	3	56.880	6	188.569	9	268.386	12	72.004	15	29.927
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	29.928	4	72.004	7	268.386	10	188.569	13	56.880																																				
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3	56.880	6	188.569	9	268.386	12	72.004	15	29.927																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
1	42.300	4	63.608	7	286.235	10	144.626	13	52.986																																				
2	46.512	5	84.412	8	444.249	11	84.412	14	46.512																																				
3	52.986	6	144.626	9	286.235	12	63.608	15	42.300																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	3.907	11	24.867	21	68.989	31	138.233	41	61.269	51	24.495
2	11.232	12	25.666	22	78.273	32	134.350	42	54.125	52	24.439
3	16.611	13	27.288	23	86.878	33	128.966	43	46.962	53	24.491
4	20.585	14	29.491	24	95.613	34	121.374	44	41.454	54	24.425
5	22.693	15	32.419	25	105.350	35	113.643	45	36.718	55	23.894
6	23.894	16	36.718	26	113.643	36	105.350	46	32.419	56	22.694
7	24.425	17	41.454	27	121.374	37	95.613	47	29.491	57	20.584
8	24.490	18	46.962	28	128.966	38	86.878	48	27.288	58	16.611
9	24.439	19	54.125	29	134.350	39	78.273	49	25.666	59	11.232
10	24.495	20	61.269	30	138.233	40	68.989	50	24.867	60	3.906
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)																																				
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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	11.718	6	39.114	11	113.983	16	210.982	21	89.317	26	37.876
2	28.790	7	43.947	12	141.251	17	193.766	22	68.435	27	37.861
3	36.059	8	53.512	13	169.503	18	169.503	23	53.512	28	36.059
4	37.861	9	68.435	14	193.766	19	141.251	24	43.947	29	28.790
5	37.876	10	89.317	15	210.982	20	113.983	25	39.114	30	11.718

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Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	11.718	6	39.114	11	113.983	16	210.982	21	89.317	26	37.876
2	28.790	7	43.947	12	141.251	17	193.766	22	68.435	27	37.861
3	36.059	8	53.512	13	169.503	18	169.503	23	53.512	28	36.059
4	37.861	9	68.435	14	193.766	19	141.251	24	43.947	29	28.790
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5	37.876	10	89.317	15	210.982	20	113.983	25	39.114	30	11.718

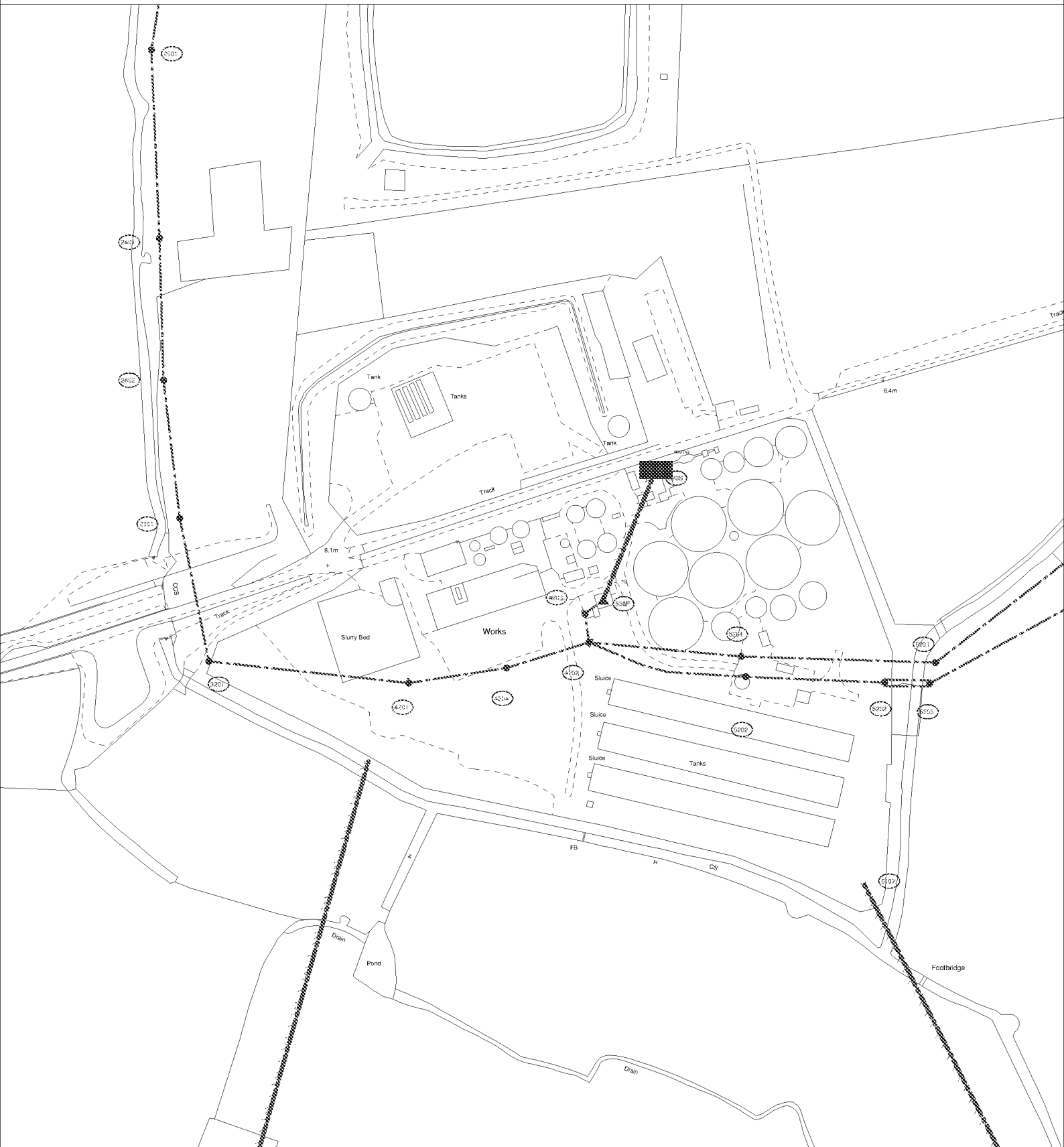
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Date 05/08/2021 11:39 File 20-061 SW NETWORK SC						Designed by Scott Collis Checked by					
Innovyze						Network 2019.1					
<u>Rainfall Hyetograph for 30 minute 100 year Winter I+40%</u> <u>for Pipe 1.014 (Storm)</u>											
Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)
1	11.718	6	39.114	11	113.983	16	210.982	21	89.317	26	37.876
2	28.790	7	43.947	12	141.251	17	193.766	22	68.435	27	37.861
3	36.059	8	53.512	13	169.503	18	169.503	23	53.512	28	36.059
4	37.861	9	68.435	14	193.766	19	141.251	24	43.947	29	28.790
5	37.876	10	89.317	15	210.982	20	113.983	25	39.114	30	11.718
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C & A Consulting Engineers Ltd				Page 72																																									
Landmark House Station Road, Hook Hampshire RG27 9HA																																													
Date 05/08/2021 11:39 File 20-061 SW NETWORK SC		Designed by Scott Collis Checked by																																											
Innovyze		Network 2019.1																																											
<u>Rainfall Hyetograph for 15 minute 100 year Winter I+40%</u> <u>for Pipe 1.015 (Storm)</u> <table><tr><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td><td>Time (mins)</td><td>Rain (mm/hr)</td></tr><tr><td>1</td><td>29.928</td><td>4</td><td>72.004</td><td>7</td><td>268.386</td><td>10</td><td>188.569</td><td>13</td><td>56.880</td></tr><tr><td>2</td><td>54.613</td><td>5</td><td>116.548</td><td>8</td><td>311.751</td><td>11</td><td>116.548</td><td>14</td><td>54.613</td></tr><tr><td>3</td><td>56.880</td><td>6</td><td>188.569</td><td>9</td><td>268.386</td><td>12</td><td>72.004</td><td>15</td><td>29.927</td></tr></table>						Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	Time (mins)	Rain (mm/hr)	1	29.928	4	72.004	7	268.386	10	188.569	13	56.880	2	54.613	5	116.548	8	311.751	11	116.548	14	54.613	3	56.880	6	188.569	9	268.386	12	72.004	15	29.927
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ø1982- 2019 Innovyze																																													

Appendix K Southern Water Correspondence

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.

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O.S. REF: SU9403SW

Scale: 1:2500

Sewer Plot

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

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

ARUN DISTRICT COUNCIL AL107/21/PL



Printed By: Mercy

Date: 25-11-2020

WTW

Requested By:



from
**Southern
Water**

Martin Riches
Charles & Associates
Park House
Park Farm
Ditton
Aylesford
Kent
ME20 6SN

Your ref

Our ref
DS_CC_PPE-121194

Date
25 November 2020

Contact
Tel: 0330 303 0119

Dear Mr Riches,

Level 1 Capacity Check Enquiry: Land at Woodgate Centre, Oak Tree Lane, Woodgate, West Sussex, PO20 3GU.

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

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of 1.5 l/s for the above development at manhole reference SU94043002. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at **Lidsey WTW** which is located approximately **800 metres** South of the proposed development site. Rights are not issued for a direct connection to Wastewater Treatment Works (WTW). Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

New Infrastructure Charging

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

our charges. Please read through our new charging arrangement documents available at the following link [REDACTED]

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

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: [REDACTED]

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

Should it be necessary to contact us please quote our above reference number relating to this application by email [REDACTED]

Yours sincerely,

[REDACTED]
Joff Edevane
Growth Planning Lead
Business Channels