

**LAND WEST OF FONTWELL AVENUE
FRA AND DRAINAGE STRATEGY
NOVEMBER 2021**



LAND WEST OF FONTWELL AVENUE

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

November 2021

Reside Developments Ltd

RESIDENTIAL DEVELOPMENT LAND WEST OF FONTWELL AVENUE

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

CONTROLLED DOCUMENT

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RESIDENTIAL DEVELOPMENT LAND WEST OF FONTWELL AVENUE

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

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1. INTRODUCTION

- 1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Paul Basham Associates on behalf of Reside Developments Ltd to support an outline planning application for a residential site. The land is located to the west of Fontwell Avenue (A29), Eastergate, Arun. The nearest postcode is PO20 3RX, and the grid reference is 494644,106146.

2. SITE DETAILS

- 2.1 The plot size is approximately 0.38ha and the land is currently arable farmland with associated out buildings and dwellings. The topographical survey shows the site has a high point of 16.41m AOD at the north-west of the site, with a level of 15.95m AOD in the south-east. This shows a rather gentle fall over 75m, giving a gradient of 1:163. See **Figure 1** for site location.
- 2.2 The development aspirations are for up to 8 residential dwellings with the associated hardstanding and landscaping. See **Appendix A** for the site layout.



Figure 1: Site Location Plan

Site Geology

- 2.3 A review of the British Geological Survey (BGS) mapping indicates that the bedrock geology beneath the site is Lambeth Group - Clay, silt and sand. Sedimentary bedrock formed between 59.2 and 47.8 million years ago during the Palaeogene period.
- 2.4 There also superficial deposits of Head - Gravel, sand, silt and clay. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period. See **Figure 2** for the BGS map extract.



Figure 2: BGS bedrock mapping

- 2.5 At the time that the prepared Flood Risk Assessment was written, a site investigation had not been completed. It is recommended to undertake Soakage Tests and Groundwater Monitoring at the proposed development site. Further Testing is scheduled to take place and this will be provided within an Addendum to this FRA.

- 2.6 However, a Site Investigation was undertaken by Soils Limited in February 2021 for the adjacent proposed development, immediately north of the proposed development site.
- 2.7 This Site Investigation Report (Ref: 1518/FLR Rev 1.02) confirms that infiltration rates were achieved and range from 1.07×10^{-4} to 8.57×10^{-5} .

3. EXISTING DRAINAGE

Existing Surface Water Drainage

- 3.1 There appears to be no existing surface water drainage provisions proximate to the site.
- 3.2 The greenfield run-off rates for the existing site have been estimated using the HR Wallingford online calculator on the UK SuDS website. The run-off rates are shown in **Figure 3** below. See **Appendix B** for a copy of the full report.

Greenfield runoff rates	Default	Edited
Q _{BAR} (l/s):	0.07	0.07
1 in 1 year (l/s):	0.06	0.06
1 in 30 years (l/s):	0.16	0.16
1 in 100 year (l/s):	0.22	0.22
1 in 200 years (l/s):	0.26	0.26

Figure 3: Greenfield runoff rates

- 3.3 The developed area impermeable area has been calculated at 0.14ha, which provides the developed area greenfield rates as shown in **Figure 4**. The developed area is all the impermeable areas added together (roofs, driveways, internal road, footway, and a nominal patio allowance of 3.0x3.0m) with an addition 10% allowance for urban creep. **Appendix B** for a copy of the full report.

Greenfield runoff rates		Default	Edited
Q _{BAR} (l/s):		0.03	0.03
1 in 1 year (l/s):		0.02	0.02
1 in 30 years (l/s):		0.06	0.06
1 in 100 year (l/s):		0.09	0.09
1 in 200 years (l/s):		0.1	0.1

Figure 4: Developed area greenfield runoff rates

Existing Foul Water Drainage

- 3.4 The existing foul water drainage provisions are a Southern Water foul sewer within the adjacent site to the north, flowing southbound. See **Appendix C** for a copy of Southern Water's sewer mapping.
- 3.5 There is a proposed foul water drainage system in the adjacent site to the north (Planning ref: BN/50/20/PL).

4. FLOOD RISK

Fluvial/tidal flooding

- 4.1 Flood mapping obtained from the Environment Agency's 'flood map for planning' website has identified that the site falls wholly within Flood Zone 1. Flood Zone 1 is defined as land having less than 0.1% chance of flooding in any year. See **Figure 5** for a snip of the Environment Agency's flood map for planning.

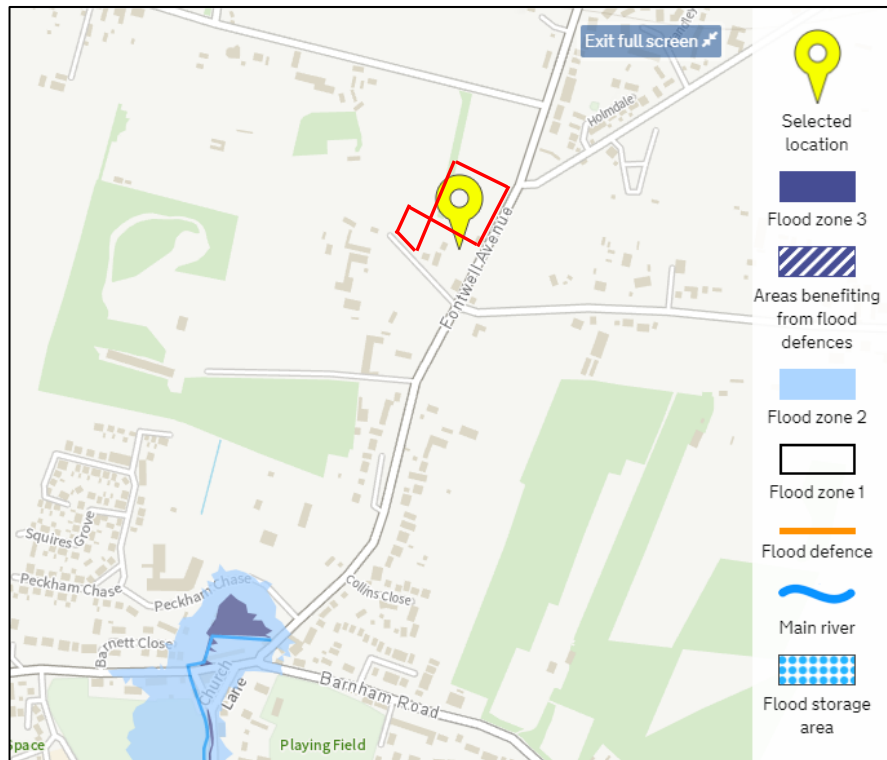


Figure 5: Flood Map for Planning

Long term flood risk from rivers, seas and reservoirs

- 4.2 The long-term flood risk and from rivers, seas and reservoirs mapping shows that the site is not considered to be at long-term risk of flooding from rivers and seas. See **Figure 6** below for a snip of the long-term risk of from rivers and seas map

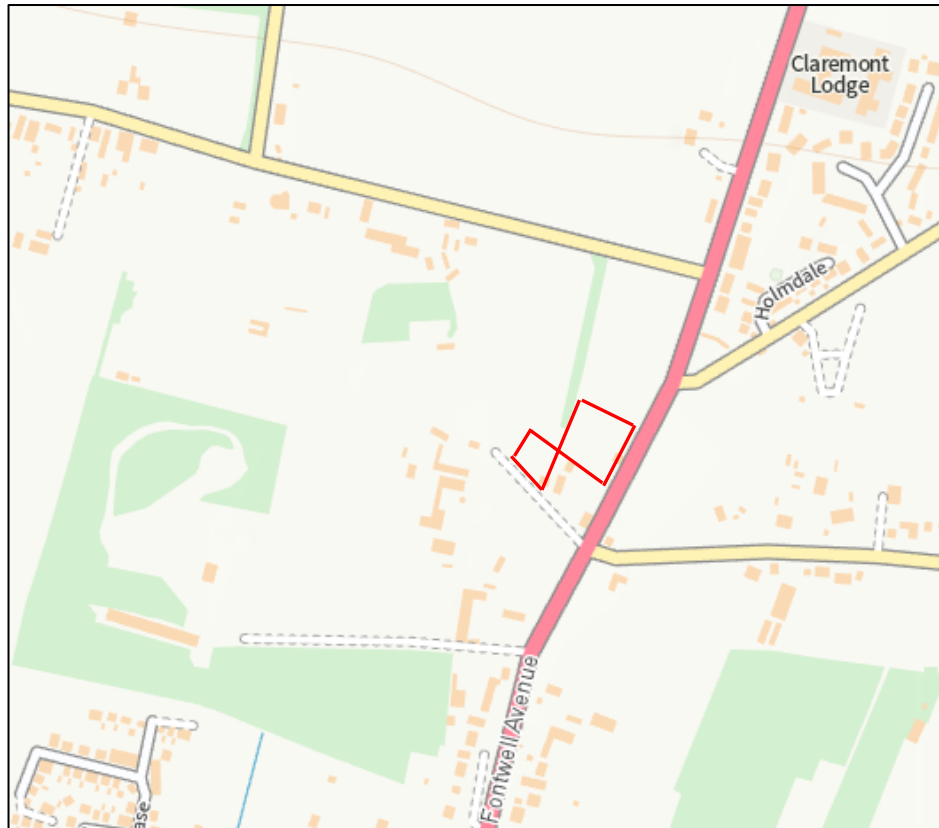


Figure 6: Long-term flood risk from rivers, seas and reservoirs map

Long-term surface water flood risk

- 4.3 Surface water or 'pluvial' flooding results from rainfall running over ground before eventually entering a watercourse or sewer. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is already saturated, frozen, developed (for example in an urban setting), or otherwise has low permeability.

- 4.4 The surface water flood risk map is shown in **Figure 7** and indicates that the site is considered to have a very low risk of long-term surface water flooding. However, it is noted that Fontwell Avenue (A29) has a medium risk of flooding which is defined as land having a chance of flooding between 1% and 3.3% in any year.

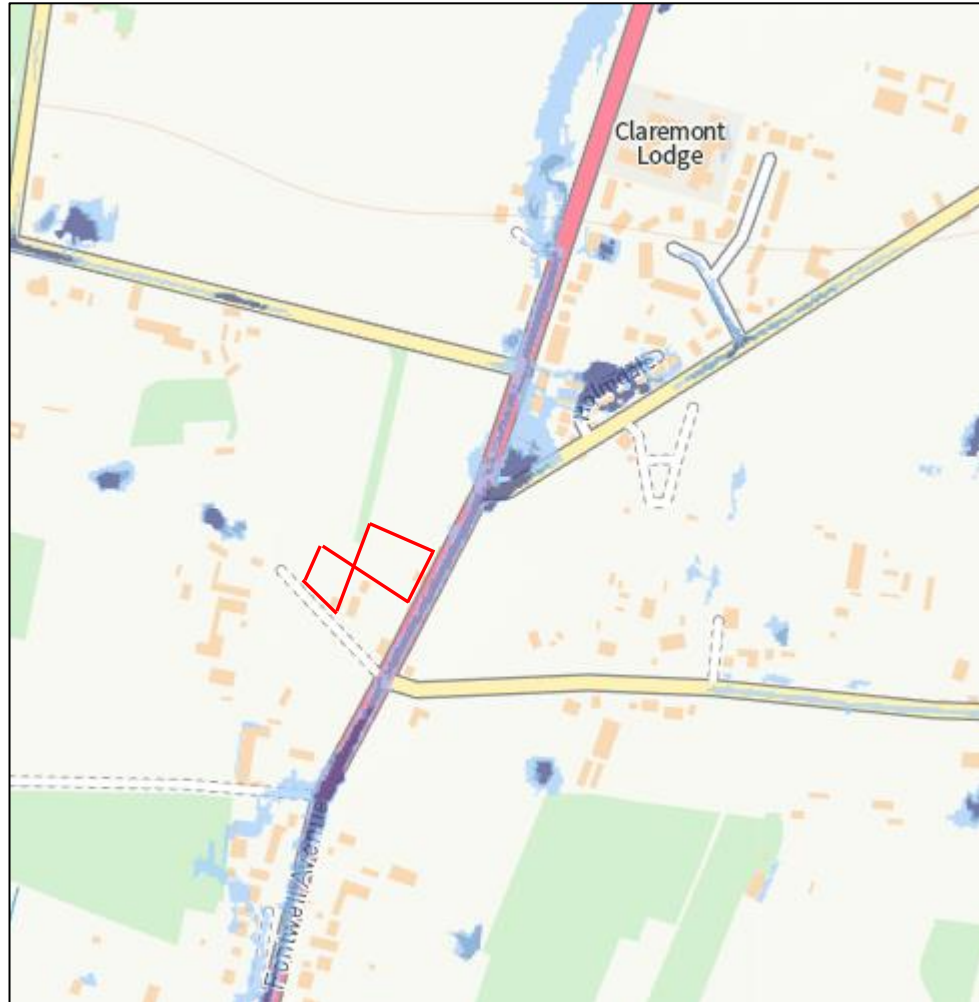


Figure 7: Long term flood risk from surface water

National Planning Policy Framework (NPPF)

- 4.5 This report has been prepared considering the National Planning Policy Framework (NPPF) Technical Guidance and the Environment Agency's (EA) flood risk standing advice.
- 4.6 Table 3 from the NPPF Technical Guidance has been included as **Figure 8** below. This provides the classes of development (based on flood risk vulnerability) that are permitted within each of the flood zones. The Flood Risk Vulnerability Classification for the site is 'More Vulnerable' as it is a housing development, which is defined in Table 2 of the Planning Practice Guidance. Based on this, the development is appropriate as it passes the Sequential Test and no Exception Test is required.

Flood Zones	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Table 3 - Flood risk vulnerability and flood zone 'compatibility'

Key: ✓ Development is appropriate ✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the [Sequential Test](#) which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and [Exception Tests](#) do not need to be applied to [minor developments](#) and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* " * "In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere

Minor development means:

- minor non-residential extensions: industrial/commercial/leisure etc extensions with a footprint less than 250 square metres.
- alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
- householder development: For example; sheds, garages, games rooms etc within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

Figure 8: NPPF Planning Practice Guidance Table – Flood Risk Vulnerability and Flood Zone Compatibility

Groundwater Flooding

- 4.7 Groundwater flooding occurs when groundwater levels increase sufficiently for the water table to intersect the ground surface. Groundwater flooding can occur in a variety of geological settings including valleys and in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels.
- 4.8 Magic Map by Defra uses the same base information as BGS and shows that the site is at low risk of ground-water flooding. Groundwater monitoring will be required to be undertaken to confirm this.
- 4.9 Magic Map by Defra uses the same base information as BGS and shows that the site is classed as a Secondary A Aquifer, which comprises layers that support local water supplies, and may form an important source of base flow to rivers.
- 4.10 The groundwater flooding risk for the site is considered to be low. Four-month groundwater monitoring was completed for the adjacent site to the north (**planning ref: BN/50/20/PL**) by Forge Environmental Management Ltd in September 2020. The results showed the water level ranged to from 2.96m bgl to 3.51m bgl; these values can be considered to not put the site at risk of groundwater flooding.
- 4.11 It is proposed that further ground water monitoring is to be carried out in the coming winter months, which will in turn inform the design for the scheme at reserved matters.

5. DRAINAGE STRATEGY

Potential Surface Water Drainage Strategy

- 5.1 In line with the Building Regulations Part H3, surface water shall discharge to one of the following, listed in order of priority:
- An adequate infiltration system: or, where not reasonably practicable,
 - A watercourse; or, where not reasonably practicable,
 - A sewer.
- 5.2 It is currently assumed that infiltration devices will be suitable on this proposed development site. This is due to infiltration being achieved on the adjacent proposed development to the north.
- 5.3 The infiltration rate for this site is based on the “worst case” rates achieved on the adjacent site. Therefore, all soakaways and permeable paving have been designed using the infiltration rate of 8.57×10^{-5} .
- 5.4 The main roads, parking courts and private drives will all be managed through permeable paving with all roof areas being conveyed to cellular crate soakaways within the rear gardens.
- 5.5 The proposed Surface Water drainage strategy is shown in **Appendix D**.

MicroDrainage Calculations

- 5.6 Microdrainage calculations have been undertaken for the cellular soakaways and show that in both the 10yr and 100yr (+40%) storm events there is no flooding and that the half drain time criteria are met. The results are shown in **Appendix E**.

Potential Foul Water Drainage Strategy

- 5.7 The proposals for the foul drainage are to discharge to the existing foul sewer adjacent Fontwell Avenue, via the proposed infrastructure within the development to the north.
- 5.8 The proposals require that the sewer levels within the adjacent development are designed as to facilitate a gravity connection from this proposed development.
- 5.9 The proposed Foul Water drainage proposals are shown in **Appendix D**.
- 5.10 Based on the Sewerage Sector Guidance, a foul flow of 4000litres of water per property per day has been used for the foul water drainage design, therefore the design flow is 0.37l/s for up to 8 residential dwellings. A pipe of 100mm diameter is to be specified in the design for 10 properties or less.

6. SUMMARY AND CONCLUSION

- 6.1 This FRA has been prepared by Paul Basham Associates to help assess the suitability of the site for development located to the west of Fontwell Avenue, Eastergate, Arun.
- 6.2 There is no increase in flood risk, either on site or downstream, as a result of the proposed development and no flood reduction measures are required based on the assumptions made in this report.
- 6.3 It has been identified that the site lies wholly with Flood Zone 1 and has a very low risk of flooding. The proposed drainage system has been designed for the 1:100year storm event with an additional 40% allowance for climate change.
- 6.4 The site has also been assessed for all sources of flood risk such as rivers, groundwater, canals, reservoirs, surface water (pluvial flooding) and sewer, and it is concluded that the site is not a risk of any means of flooding.

Drainage Strategy

- 6.5 In accordance with the Environment Agency, National Planning Policy Framework and current best practices, it is intended to attenuate the run-off at source using a number of different SuDS techniques, which also help improving the water quality prior to discharge into the ground.
- 6.6 In this instance, given the underlying geology consists of silty/clayey GRAVEL, it is assumed that infiltration devices will be suitable at this location.
- 6.7 The drainage strategy employed will comprise the following:
- Surface water via infiltration with a combination of soakaways and permeable pavements
 - Piped networks for foul water with the strategy via gravity and through the adjacent site
 - The new foul sewers will be connected to the existing network via an agreement with Southern Water under Section 106 of the Water Industry Act 1991
- 6.8 The proposed foul drainage strategy comprises a gravity drain network made up of 100mm diameter pipes running in the main access roads and landscaping through the site. Sewage will then be drained into the existing foul sewers based on the guidance within the Sewerage Sector Guidance.

- 6.9 Based on the Sewerage Sector Guidance, a foul flow of 4000litres of water per property per day has been used for the foul water drainage design, therefore the design flow is 0.37l/s for up to 8 residential dwellings.

General

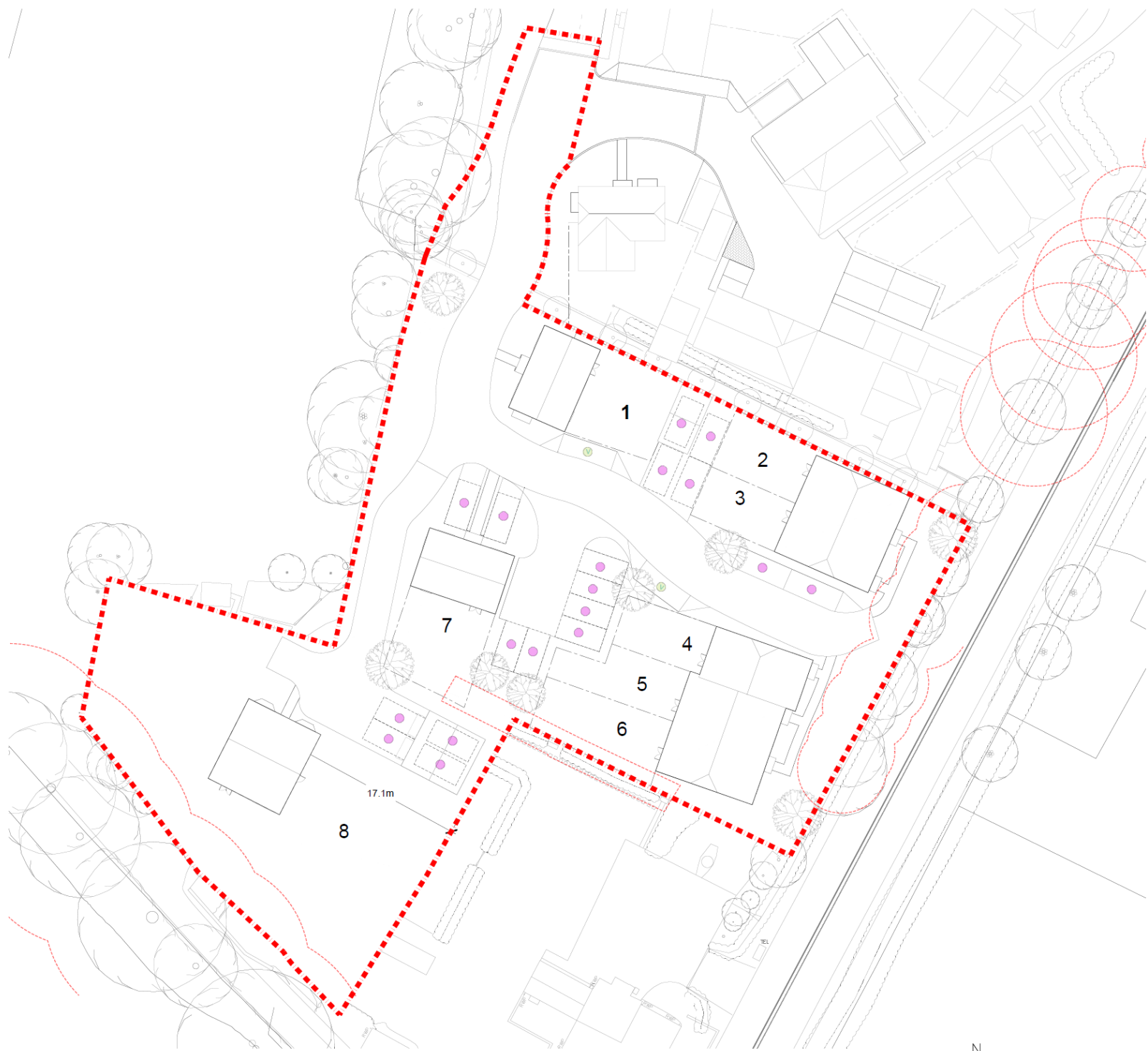
- 6.10 It is important to note that the surface and foul water strategies outlined in this report may not necessarily form the final design. It is simply a demonstration of the most suitable and technically feasible designs for the proposed development, based on the information available at present. Site constraints and economic appraisals undertaken as part of the design stage may result in suitable amendments to the current strategies.
- 6.11 This FRA has been prepared considering the National Planning Policy Framework Technical Guidance and the EA Flood Risk Standing Advice. This report has quantified the flood risk posed to the proposed development as being More Vulnerable which is a suitable development type for Flood Zone 1.

Appendix A

Land West of Fontwell Avenue
Flood Risk Assessment & Drainage Strategy

Paul Basham Associates Ltd
Report No 020.5672/FRA&DSLWFA/3





Proposed Residential Development

Appendix B

Land West of Fontwell Avenue
Flood Risk Assessment & Drainage Strategy

Paul Basham Associates Ltd
Report No 020.5672/FRA&DSLWFA/3



Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics	Default	Edited
SOIL type:	1	1
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.1

Hydrological characteristics	Default	Edited
SAAR (mm):	778	778
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	0.07	0.07
1 in 1 year (l/s):	0.06	0.06
1 in 30 years (l/s):	0.16	0.16
1 in 100 year (l/s):	0.22	0.22
1 in 200 years (l/s):	0.26	0.26

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	1	1
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.1

Hydrological characteristics

	Default	Edited
SAAR (mm):	778	778
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	0.03	0.03
1 in 1 year (l/s):	0.02	0.02
1 in 30 years (l/s):	0.06	0.06
1 in 100 year (l/s):	0.09	0.09
1 in 200 years (l/s):	0.1	0.1

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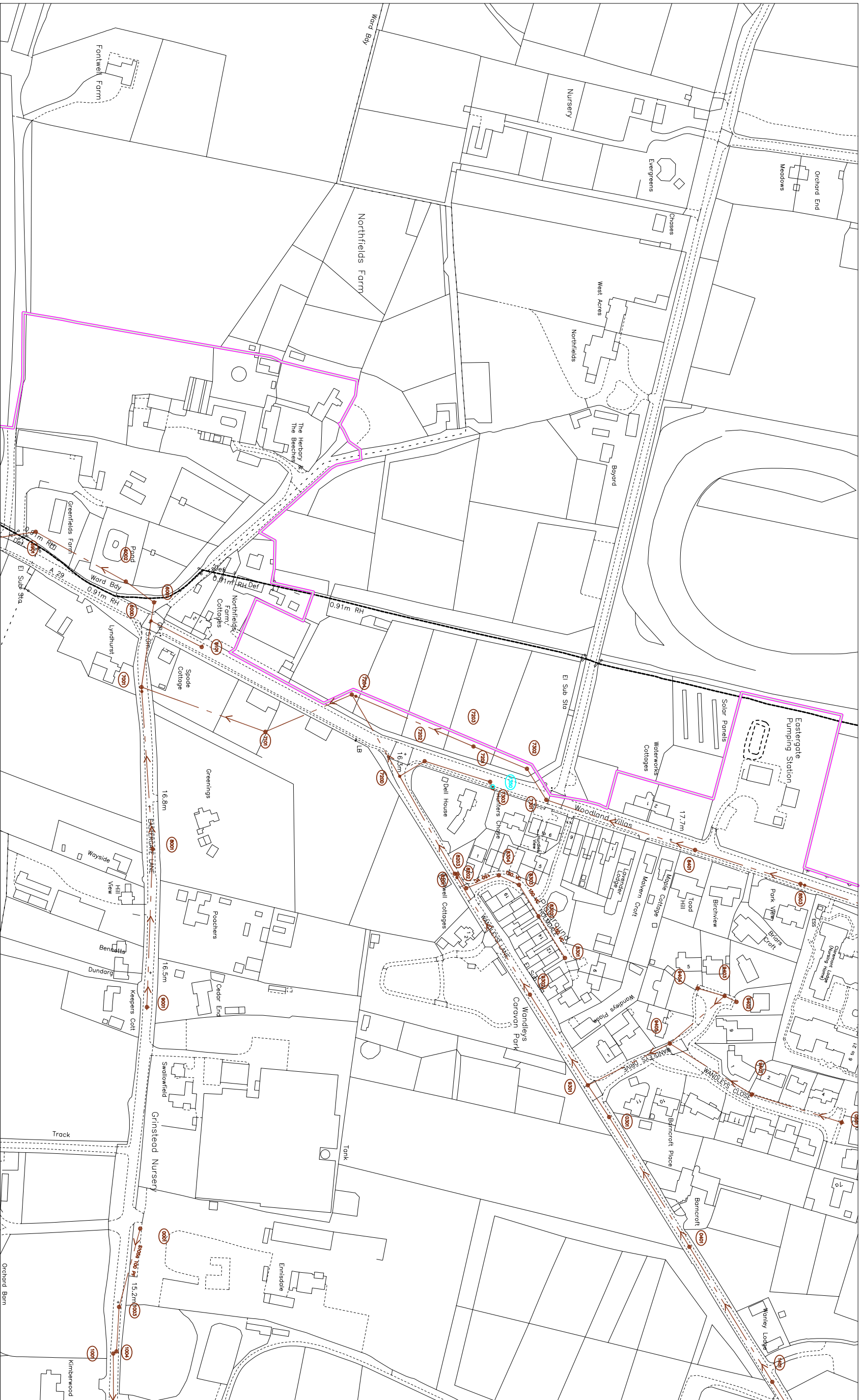
Appendix C

Land West of Fontwell Avenue
Flood Risk Assessment & Drainage Strategy

Paul Basham Associates Ltd
Report No 020.5672/FRA&DSLWFA/3



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O.S. REF.

SU9406SE

Title: 284436_Land at Northfield Cott

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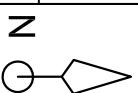
Date: 09/03/2018

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy.

The actual positions should be determined on site.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

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Southern
Water

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shope	Node	Cover	Invert	Size	Material	Shope	Node	Cover	Invert	Size	Material	Shope
0001X			100	PF	CIRC												
0301X	18.42		150	VC	CIRC												
0401X	19.05	17.58	150	VC	CIRC												
0501X	21.39	20.19	150	VC	CIRC												
1001X	15.19	13.38	175	VC	CIRC												
1003X			150	PF	CIRC												
1004X			150	VC	CIRC												
1401X	20.48	18.61	150	VC	CIRC												
6001X	14.81	13.09	225	VC	CIRC												
6002X	15.11	12.93	225	VC	CIRC												
600DX	14.93		225	VC	CIRC												
6101X	15.31		100	VC	CIRC												
6901X	15.42	12.92	225	VC	CIRC												
7001X	15.8		225	VC	CIRC												
7101X	16.11	13.73	225	VC	CIRC												
7201X	16.79	15.6	100	VC	CIRC												
7202X	16.54	14.58	100	VC	CIRC												
7203X	16.58	15.01	225	VC	CIRC												
7204X	16.38	13.89	225	VC	CIRC												
720DX	16.45	14.1	150	VC	CIRC												
7301X	17.02	15.74	225	VC	CIRC												
7302X	17.23	15.65	225	VC	CIRC												
7303X	16.92	15.72	100	CI	CIRC												
8001X	16.89	14.63	150	VC	CIRC												
8201X	17.01	14.67	150	VC	CIRC												
8202X	17.34	14.82	150	VC	CIRC												
8203X	17.07	14.73	150	VC	CIRC												
8301X	16.72	15.67	150	VC	CIRC												
8302X	16.37	15.23	150	VC	CIRC												
8303X	16.6	15.07	150	VC	CIRC												
8304X	16.8	14.96	150	VC	CIRC												
8401X	17.98	16.17	225	VC	CIRC												
8503X	19.36	16.8	225	VC	CIRC												
9001X	16.24	15.21	150	VC	CIRC												
9301X	18.26	16.84	150	VC	CIRC												
9302X	18.25	16.48	150	VC	CIRC												
9401X	20.11	18.79	150	VC	CIRC												
9402X	19.17	19.16	150	VC	CIRC												
9403X	19.16	17.83	150	VC	CIRC												
9404X	19.1	17.99	150	VC	CIRC												
9405X	18.76	17.33	150	VC	CIRC												

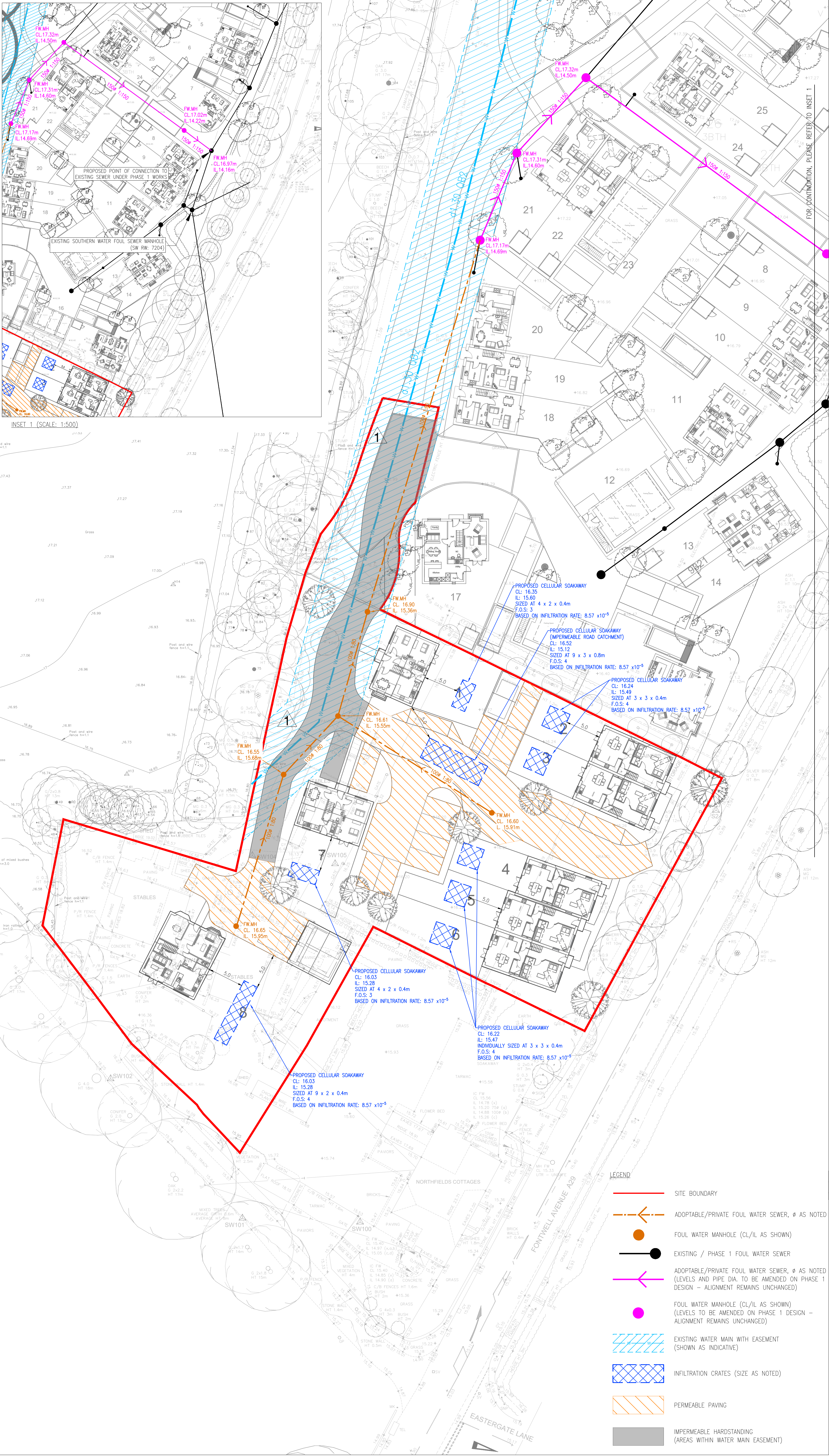
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Title: 284436_Land at Northfield Cott	
Date: 09/03/2018	

Appendix D

Land West of Fontwell Avenue
Flood Risk Assessment & Drainage Strategy

Paul Basham Associates Ltd
Report No 020.5672/FRA&DSLWFA/3



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CDM Regulations 2015 : Reg. 9			
None of the below is deemed to relieve any contractor of his obligations under all applicable health and safety legislation.			
In preparing the design shown on this and related drawings Paul Basham Associates has considered and, where reasonably practicable, eliminated foreseeable risks. Any further abnormal or unusual risks, which remain, are numbered below and identified thus (A) and should be given particular attention by all those carrying out construction or of future maintenance works.			
1.	Existing water mains present		
2.			

- GENERAL NOTES**
- THIS DRAWING IS INTENDED TO BE VIEWED IN COMBINATION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, SERVICES AND SPECIALIST DRAWINGS AND SPECIFICATION.
 - ANY VARIATIONS OR DISCREPANCIES BETWEEN THESE DRAWINGS IN TERMS OF DIMENSIONS OR DETAILS SHOULD BE DRAWN TO THE ATTENTION OF THE ARCHITECT AND/OR THE ENGINEER FOR CLARIFICATION.
 - PAUL BASHAM ASSOCIATES ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF BACKGROUND INFORMATION PRODUCED BY THIRD PARTIES - THIS MUST BE TREATED AS INDICATIVE ONLY.
 - ALL DIMENSIONS AND LEVELS ARE IN METRES. DO NOT SCALE THIS DRAWING, PRINT, PLOT OR DISK.
 - THIS DRAWING SHOULD ONLY BE USED FOR CONSTRUCTION IF THE PROJECT PHASE IN THE TITLE FRAME BELOW IS SHOWN AS "CONSTRUCTION". PAUL BASHAM ASSOCIATES TAKE NO RESPONSIBILITY FOR CONSTRUCTION WORKS UNDERTAKEN TO DRAWINGS WHICH ARE NOT MARKED UNDER THIS PHASE.

- DRAINAGE**
- SURFACE WATER INFILTRATION CALCULATIONS BASED ON FOLLOWING ARUN DC FACTORS OF SAFETY FOR "MINOR INCONVENIENCE" CONSEQUENCES OF FAILURE:

AREA TO BE DRAINED <100m² : Cv=0.75 ; FOS OF 3
AREA TO BE DRAINED 100m²-1000m² : Cv=0.75 ; FOS OF 4
 - SOAKAWAYS IN OPEN SPACES/GARDENS SHOWN AS HAVING c.300mm OF COVER FROM PROPOSED GROUND LEVEL TO TOP OF STRUCTURE.
 - SOAKAWAY OFFSETS TO BE 5m FROM ALL FOUNDATIONS
 - INFILTRATION RATES HAVE BEEN BASED ON THE WORST CASE SCENARIO FOR THE DEVELOPMENT SITE TO THE NORTH. THE INFILTRATION RATE USED IS 8.57 x 10⁻⁵.
 - EXISTING GROUND WATER TAKEN AS 2.96m BGL.



PRELIMINARY
DRAWING/DESIGN IS STILL 'IN DEVELOPMENT'
YOU ARE ADVISED TO MAKE DUE ALLOWANCE

B	SITE LAYOUT UPDATED	05.11.21	CLP	CJL
A	UPDATED APPLICATION BOUNDARY	28.10.21	CLP	CJL
Rev	Description	Date	By	Chkd

Paul Basham Associates Ltd
The Botley, Cam's Hall Estate, Fareham, PO16 8UT
info@paulbashamassociates.com www.paulbashamassociates.com

Client

reside.

Project Name
**LAND WEST OF FONTWELL AVENUE
EASTERGATE, ARUN**

Title
OUTLINE DRAINAGE STRATEGY

Project Phase
PRELIMINARY

Checked By	Checked Date	Drawn By	Drawn Date
CJL	20.10.2021	CLP	18.10.2021

Client Drawing No. - Scale 1:250 (AT A1 SIZE)

PBA Drawing No. 020.5762.021 Revision B

- LEGEND**
- SITE BOUNDARY
 - ADOPTABLE/PRIVATE FOUL WATER SEWER, Ø AS NOTED
 - FOUL WATER MANHOLE (CL/IL AS SHOWN)
 - EXISTING / PHASE 1 FOUL WATER SEWER
 - ADOPTABLE/PRIVATE FOUL WATER SEWER, Ø AS NOTED (LEVELS AND PIPE DIA. TO BE AMENDED ON PHASE 1 DESIGN - ALIGNMENT REMAINS UNCHANGED)
 - FOUL WATER MANHOLE (CL/IL AS SHOWN) (LEVELS TO BE AMENDED ON PHASE 1 DESIGN - ALIGNMENT REMAINS UNCHANGED)
 - EXISTING WATER MAIN WITH EASEMENT (SHOWN AS INDICATIVE)
 - INFILTRATION CRATES (SIZE AS NOTED)
 - PERMEABLE PAVING
 - IMPERMEABLE HARDSTANDING (AREAS WITHIN WATER MAIN EASEMENT)

Appendix E

Land West of Fontwell Avenue
Flood Risk Assessment & Drainage Strategy

Paul Basham Associates Ltd
Report No 020.5672/FRA&DSLWFA/3



Paul Basham Associates		Page 1
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 1 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.008

Time (mins)	Area
From:	To: (ha)
0	4 0.008

Paul Basham Associates		Page 2
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 1 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Model Details

Storage is Online Cover Level (m) 16.350

Cellular Storage Structure

Invert Level (m) 15.600 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	8.0	8.0	0.400	8.0	12.5	0.401	0.0	12.5

Paul Basham Associates		Page 1
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 2 & 3 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 2 & 3 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Half Drain Time : 119 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.687	0.197	0.4	3.0	O K
30 min Summer	15.746	0.256	0.4	3.9	O K
60 min Summer	15.794	0.304	0.4	4.6	O K
120 min Summer	15.816	0.326	0.5	5.0	O K
180 min Summer	15.815	0.325	0.5	4.9	O K
240 min Summer	15.806	0.316	0.5	4.8	O K
360 min Summer	15.787	0.297	0.4	4.5	O K
480 min Summer	15.765	0.275	0.4	4.2	O K
600 min Summer	15.744	0.254	0.4	3.9	O K
720 min Summer	15.724	0.234	0.4	3.6	O K
960 min Summer	15.686	0.196	0.4	3.0	O K
1440 min Summer	15.624	0.134	0.4	2.0	O K
2160 min Summer	15.565	0.075	0.4	1.1	O K
2880 min Summer	15.539	0.049	0.4	0.8	O K
4320 min Summer	15.527	0.037	0.3	0.6	O K
5760 min Summer	15.520	0.030	0.2	0.4	O K
7200 min Summer	15.515	0.025	0.2	0.4	O K
8640 min Summer	15.512	0.022	0.2	0.3	O K
10080 min Summer	15.509	0.019	0.1	0.3	O K
15 min Winter	15.713	0.223	0.4	3.4	O K
30 min Winter	15.781	0.291	0.4	4.4	O K
60 min Winter	15.839	0.349	0.5	5.3	O K
120 min Winter	15.866	0.376	0.5	5.7	O K
180 min Winter	15.863	0.373	0.5	5.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	125.658	0.0	18
30 min Summer	85.511	0.0	32
60 min Summer	55.544	0.0	60
120 min Summer	34.763	0.0	100
180 min Summer	25.981	0.0	132
240 min Summer	20.983	0.0	166
360 min Summer	15.545	0.0	234
480 min Summer	12.541	0.0	304
600 min Summer	10.607	0.0	370
720 min Summer	9.245	0.0	434
960 min Summer	7.435	0.0	562
1440 min Summer	5.457	0.0	808
2160 min Summer	3.995	0.0	1148
2880 min Summer	3.197	0.0	1468
4320 min Summer	2.331	0.0	2204
5760 min Summer	1.863	0.0	2928
7200 min Summer	1.567	0.0	3672
8640 min Summer	1.360	0.0	4376
10080 min Summer	1.207	0.0	5088
15 min Winter	125.658	0.0	18
30 min Winter	85.511	0.0	32
60 min Winter	55.544	0.0	60
120 min Winter	34.763	0.0	112
180 min Winter	25.981	0.0	140

Paul Basham Associates		Page 2
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 2 & 3 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 2 & 3 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	15.850	0.360	0.5	5.5	O K
360 min Winter	15.820	0.330	0.5	5.0	O K
480 min Winter	15.786	0.296	0.4	4.5	O K
600 min Winter	15.753	0.263	0.4	4.0	O K
720 min Winter	15.722	0.232	0.4	3.5	O K
960 min Winter	15.666	0.176	0.4	2.7	O K
1440 min Winter	15.582	0.092	0.4	1.4	O K
2160 min Winter	15.535	0.045	0.3	0.7	O K
2880 min Winter	15.527	0.037	0.3	0.6	O K
4320 min Winter	15.517	0.027	0.2	0.4	O K
5760 min Winter	15.512	0.022	0.2	0.3	O K
7200 min Winter	15.508	0.018	0.1	0.3	O K
8640 min Winter	15.506	0.016	0.1	0.2	O K
10080 min Winter	15.504	0.014	0.1	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	20.983	0.0	180
360 min Winter	15.545	0.0	254
480 min Winter	12.541	0.0	328
600 min Winter	10.607	0.0	398
720 min Winter	9.245	0.0	464
960 min Winter	7.435	0.0	596
1440 min Winter	5.457	0.0	824
2160 min Winter	3.995	0.0	1120
2880 min Winter	3.197	0.0	1468
4320 min Winter	2.331	0.0	2204
5760 min Winter	1.863	0.0	2936
7200 min Winter	1.567	0.0	3744
8640 min Winter	1.360	0.0	4312
10080 min Winter	1.207	0.0	5120

Paul Basham Associates		Page 3
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 2 & 3 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 2 & 3 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.014

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

0	4	0.014
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Paul Basham Associates		Page 4
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 2 & 3 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 2 & 3 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Model Details

Storage is Online Cover Level (m) 16.240

Cellular Storage Structure

Invert Level (m) 15.490 Safety Factor 4.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	16.0	16.0	0.400	16.0	22.4	0.401	0.0	22.4

Paul Basham Associates		Page 1
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 4 - 6 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Half Drain Time : 112 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.644	0.174	0.7	4.5	O K
30 min Summer	15.696	0.226	0.7	5.8	O K
60 min Summer	15.738	0.268	0.7	6.9	O K
120 min Summer	15.755	0.285	0.7	7.3	O K
180 min Summer	15.753	0.283	0.7	7.3	O K
240 min Summer	15.745	0.275	0.7	7.1	O K
360 min Summer	15.726	0.256	0.7	6.6	O K
480 min Summer	15.705	0.235	0.7	6.0	O K
600 min Summer	15.685	0.215	0.7	5.5	O K
720 min Summer	15.665	0.195	0.7	5.0	O K
960 min Summer	15.630	0.160	0.6	4.1	O K
1440 min Summer	15.575	0.105	0.6	2.7	O K
2160 min Summer	15.527	0.057	0.6	1.5	O K
2880 min Summer	15.514	0.044	0.5	1.1	O K
4320 min Summer	15.503	0.033	0.4	0.8	O K
5760 min Summer	15.497	0.027	0.3	0.7	O K
7200 min Summer	15.492	0.022	0.3	0.6	O K
8640 min Summer	15.490	0.020	0.2	0.5	O K
10080 min Summer	15.487	0.017	0.2	0.4	O K
15 min Winter	15.667	0.197	0.7	5.0	O K
30 min Winter	15.727	0.257	0.7	6.6	O K
60 min Winter	15.777	0.307	0.7	7.9	O K
120 min Winter	15.799	0.329	0.7	8.4	O K
180 min Winter	15.795	0.325	0.7	8.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	125.658	0.0	18
30 min Summer	85.511	0.0	32
60 min Summer	55.544	0.0	60
120 min Summer	34.763	0.0	98
180 min Summer	25.981	0.0	130
240 min Summer	20.983	0.0	164
360 min Summer	15.545	0.0	234
480 min Summer	12.541	0.0	302
600 min Summer	10.607	0.0	368
720 min Summer	9.245	0.0	434
960 min Summer	7.435	0.0	558
1440 min Summer	5.457	0.0	794
2160 min Summer	3.995	0.0	1124
2880 min Summer	3.197	0.0	1468
4320 min Summer	2.331	0.0	2204
5760 min Summer	1.863	0.0	2928
7200 min Summer	1.567	0.0	3672
8640 min Summer	1.360	0.0	4384
10080 min Summer	1.207	0.0	5136
15 min Winter	125.658	0.0	18
30 min Winter	85.511	0.0	32
60 min Winter	55.544	0.0	60
120 min Winter	34.763	0.0	112
180 min Winter	25.981	0.0	140

Paul Basham Associates		Page 2
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021	Designed by C Pritchard	
File 020.5762 PLOT 4 - 6 SOAKAWAY ...	Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	15.782	0.312	0.7	8.0	O K
360 min Winter	15.752	0.282	0.7	7.2	O K
480 min Winter	15.720	0.250	0.7	6.4	O K
600 min Winter	15.688	0.218	0.7	5.6	O K
720 min Winter	15.659	0.189	0.7	4.8	O K
960 min Winter	15.607	0.137	0.6	3.5	O K
1440 min Winter	15.534	0.064	0.6	1.6	O K
2160 min Winter	15.511	0.041	0.5	1.0	O K
2880 min Winter	15.503	0.033	0.4	0.8	O K
4320 min Winter	15.494	0.024	0.3	0.6	O K
5760 min Winter	15.489	0.019	0.2	0.5	O K
7200 min Winter	15.486	0.016	0.2	0.4	O K
8640 min Winter	15.484	0.014	0.2	0.4	O K
10080 min Winter	15.483	0.013	0.2	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	20.983	0.0	178
360 min Winter	15.545	0.0	254
480 min Winter	12.541	0.0	326
600 min Winter	10.607	0.0	394
720 min Winter	9.245	0.0	462
960 min Winter	7.435	0.0	586
1440 min Winter	5.457	0.0	794
2160 min Winter	3.995	0.0	1108
2880 min Winter	3.197	0.0	1472
4320 min Winter	2.331	0.0	2236
5760 min Winter	1.863	0.0	2840
7200 min Winter	1.567	0.0	3632
8640 min Winter	1.360	0.0	4288
10080 min Winter	1.207	0.0	5240

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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021	Designed by C Pritchard	
File 020.5762 PLOT 4 - 6 SOAKAWAY ...	Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.021

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

0	4	0.021
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Paul Basham Associates		Page 4
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 1 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 4 - 6 SOAKAWAY ...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

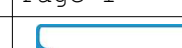
Model Details

Storage is Online Cover Level (m) 16.220

Cellular Storage Structure

Invert Level (m) 15.470 Safety Factor 4.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	27.0	27.0	0.400	27.0	35.3	0.401	0.0	35.3

Paul Basham Associates		Page 1
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 7 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 7 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Half Drain Time : 82 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.500	0.220	0.3	1.7	O K
30 min Summer	15.561	0.281	0.3	2.1	O K
60 min Summer	15.604	0.324	0.3	2.5	O K
120 min Summer	15.620	0.340	0.3	2.6	O K
180 min Summer	15.613	0.333	0.3	2.5	O K
240 min Summer	15.599	0.319	0.3	2.4	O K
360 min Summer	15.570	0.290	0.3	2.2	O K
480 min Summer	15.541	0.261	0.3	2.0	O K
600 min Summer	15.514	0.234	0.3	1.8	O K
720 min Summer	15.489	0.209	0.3	1.6	O K
960 min Summer	15.446	0.166	0.3	1.3	O K
1440 min Summer	15.382	0.102	0.3	0.8	O K
2160 min Summer	15.333	0.053	0.2	0.4	O K
2880 min Summer	15.322	0.042	0.2	0.3	O K
4320 min Summer	15.311	0.031	0.2	0.2	O K
5760 min Summer	15.305	0.025	0.1	0.2	O K
7200 min Summer	15.301	0.021	0.1	0.2	O K
8640 min Summer	15.298	0.018	0.1	0.1	O K
10080 min Summer	15.296	0.016	0.1	0.1	O K
15 min Winter	15.528	0.248	0.3	1.9	O K
30 min Winter	15.600	0.320	0.3	2.4	O K
60 min Winter	15.653	0.373	0.3	2.8	O K
120 min Winter	15.669	0.389	0.4	3.0	O K
180 min Winter	15.657	0.377	0.3	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	125.658	0.0	17
30 min Summer	85.511	0.0	31
60 min Summer	55.544	0.0	58
120 min Summer	34.763	0.0	90
180 min Summer	25.981	0.0	124
240 min Summer	20.983	0.0	158
360 min Summer	15.545	0.0	226
480 min Summer	12.541	0.0	294
600 min Summer	10.607	0.0	358
720 min Summer	9.245	0.0	422
960 min Summer	7.435	0.0	546
1440 min Summer	5.457	0.0	780
2160 min Summer	3.995	0.0	1104
2880 min Summer	3.197	0.0	1468
4320 min Summer	2.331	0.0	2192
5760 min Summer	1.863	0.0	2936
7200 min Summer	1.567	0.0	3664
8640 min Summer	1.360	0.0	4344
10080 min Summer	1.207	0.0	5120
15 min Winter	125.658	0.0	17
30 min Winter	85.511	0.0	31
60 min Winter	55.544	0.0	58
120 min Winter	34.763	0.0	94
180 min Winter	25.981	0.0	134

Paul Basham Associates		Page 2
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 7 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 7 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	15.636	0.356	0.3	2.7	O K
360 min Winter	15.590	0.310	0.3	2.4	O K
480 min Winter	15.546	0.266	0.3	2.0	O K
600 min Winter	15.506	0.226	0.3	1.7	O K
720 min Winter	15.470	0.190	0.3	1.4	O K
960 min Winter	15.410	0.130	0.3	1.0	O K
1440 min Winter	15.335	0.055	0.2	0.4	O K
2160 min Winter	15.318	0.038	0.2	0.3	O K
2880 min Winter	15.311	0.031	0.2	0.2	O K
4320 min Winter	15.303	0.023	0.1	0.2	O K
5760 min Winter	15.298	0.018	0.1	0.1	O K
7200 min Winter	15.295	0.015	0.1	0.1	O K
8640 min Winter	15.293	0.013	0.1	0.1	O K
10080 min Winter	15.292	0.012	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	20.983	0.0	172
360 min Winter	15.545	0.0	244
480 min Winter	12.541	0.0	314
600 min Winter	10.607	0.0	380
720 min Winter	9.245	0.0	446
960 min Winter	7.435	0.0	568
1440 min Winter	5.457	0.0	766
2160 min Winter	3.995	0.0	1104
2880 min Winter	3.197	0.0	1468
4320 min Winter	2.331	0.0	2180
5760 min Winter	1.863	0.0	2912
7200 min Winter	1.567	0.0	3560
8640 min Winter	1.360	0.0	4248
10080 min Winter	1.207	0.0	4960

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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 7 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 7 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.008

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

0	4	0.008
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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 7 Cellular Soakaway	
Date 18.10.2021 File 020.5762 PLOT 7 SOAKAWAY CRAT...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Model Details

Storage is Online Cover Level (m) 16.030

Cellular Storage Structure

Invert Level (m) 15.280 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	8.0	8.0	0.400	8.0	12.5	0.401	0.0	12.5

Paul Basham Associates		Page 1
Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Cellular Soakaway	
Date 18.10.2021	Designed by C Pritchard	
File 020.5762 Plot 8 Soakaway Crat...	Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Half Drain Time : 114 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.387	0.187	0.5	3.2	O K
30 min Summer	15.443	0.243	0.5	4.2	O K
60 min Summer	15.488	0.288	0.5	4.9	O K
120 min Summer	15.508	0.308	0.5	5.3	O K
180 min Summer	15.506	0.306	0.5	5.2	O K
240 min Summer	15.498	0.298	0.5	5.1	O K
360 min Summer	15.478	0.278	0.5	4.8	O K
480 min Summer	15.457	0.257	0.5	4.4	O K
600 min Summer	15.436	0.236	0.5	4.0	O K
720 min Summer	15.416	0.216	0.5	3.7	O K
960 min Summer	15.379	0.179	0.5	3.1	O K
1440 min Summer	15.320	0.120	0.4	2.1	O K
2160 min Summer	15.266	0.066	0.4	1.1	O K
2880 min Summer	15.247	0.047	0.4	0.8	O K
4320 min Summer	15.235	0.035	0.3	0.6	O K
5760 min Summer	15.228	0.028	0.2	0.5	O K
7200 min Summer	15.224	0.024	0.2	0.4	O K
8640 min Summer	15.221	0.021	0.2	0.4	O K
10080 min Summer	15.218	0.018	0.1	0.3	O K
15 min Winter	15.411	0.211	0.5	3.6	O K
30 min Winter	15.476	0.276	0.5	4.7	O K
60 min Winter	15.531	0.331	0.5	5.7	O K
120 min Winter	15.555	0.355	0.5	6.1	O K
180 min Winter	15.551	0.351	0.5	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	125.658	0.0	18
30 min Summer	85.511	0.0	32
60 min Summer	55.544	0.0	60
120 min Summer	34.763	0.0	98
180 min Summer	25.981	0.0	130
240 min Summer	20.983	0.0	166
360 min Summer	15.545	0.0	234
480 min Summer	12.541	0.0	302
600 min Summer	10.607	0.0	368
720 min Summer	9.245	0.0	434
960 min Summer	7.435	0.0	560
1440 min Summer	5.457	0.0	796
2160 min Summer	3.995	0.0	1144
2880 min Summer	3.197	0.0	1468
4320 min Summer	2.331	0.0	2200
5760 min Summer	1.863	0.0	2936
7200 min Summer	1.567	0.0	3672
8640 min Summer	1.360	0.0	4320
10080 min Summer	1.207	0.0	5136
15 min Winter	125.658	0.0	18
30 min Winter	85.511	0.0	32
60 min Winter	55.544	0.0	60
120 min Winter	34.763	0.0	112
180 min Winter	25.981	0.0	140

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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Cellular Soakaway	
Date 18.10.2021	Designed by C Pritchard	
File 020.5762 Plot 8 Soakaway Crat...	Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	15.539	0.339	0.5	5.8	O K
360 min Winter	15.508	0.308	0.5	5.3	O K
480 min Winter	15.475	0.275	0.5	4.7	O K
600 min Winter	15.443	0.243	0.5	4.1	O K
720 min Winter	15.412	0.212	0.5	3.6	O K
960 min Winter	15.358	0.158	0.4	2.7	O K
1440 min Winter	15.278	0.078	0.4	1.3	O K
2160 min Winter	15.243	0.043	0.3	0.7	O K
2880 min Winter	15.235	0.035	0.3	0.6	O K
4320 min Winter	15.226	0.026	0.2	0.4	O K
5760 min Winter	15.221	0.021	0.2	0.4	O K
7200 min Winter	15.217	0.017	0.1	0.3	O K
8640 min Winter	15.215	0.015	0.1	0.3	O K
10080 min Winter	15.213	0.013	0.1	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	20.983	0.0	178
360 min Winter	15.545	0.0	254
480 min Winter	12.541	0.0	326
600 min Winter	10.607	0.0	396
720 min Winter	9.245	0.0	464
960 min Winter	7.435	0.0	588
1440 min Winter	5.457	0.0	810
2160 min Winter	3.995	0.0	1120
2880 min Winter	3.197	0.0	1472
4320 min Winter	2.331	0.0	2196
5760 min Winter	1.863	0.0	2936
7200 min Winter	1.567	0.0	3544
8640 min Winter	1.360	0.0	4416
10080 min Winter	1.207	0.0	5136

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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Cellular Soakaway	
Date 18.10.2021	Designed by C Pritchard	
File 020.5762 Plot 8 Soakaway Crat...	Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.015

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

0	4	0.015
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Lancaster Court 8 Barnes Wallis Road Fareham PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Cellular Soakaway	
Date 18.10.2021 File 020.5762 Plot 8 Soakaway Crat...	Designed by C Pritchard Checked by C Longhurst	
XP Solutions	Source Control 2014.1	

Model Details

Storage is Online Cover Level (m) 15.950

Cellular Storage Structure

Invert Level (m) 15.200 Safety Factor 4.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	0.400	18.0	24.8	0.401	0.0	24.8

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Access Road Perm Paving	
Date 05/11/2021 10:43 File 020.5762 Plot 8 Perm Paving	Designed by C Pritchard Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

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

Half Drain Time : 8 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	15.611	0.051	2.9	1.5	O K
30 min Summer	15.621	0.061	2.9	1.8	O K
60 min Summer	15.619	0.059	2.9	1.8	O K
120 min Summer	15.606	0.046	2.6	1.4	O K
180 min Summer	15.599	0.039	2.2	1.2	O K
240 min Summer	15.593	0.033	1.9	1.0	O K
360 min Summer	15.586	0.026	1.5	0.8	O K
480 min Summer	15.582	0.022	1.2	0.7	O K
600 min Summer	15.579	0.019	1.1	0.6	O K
720 min Summer	15.577	0.017	1.0	0.5	O K
960 min Summer	15.574	0.014	0.8	0.4	O K
1440 min Summer	15.570	0.010	0.6	0.3	O K
2160 min Summer	15.567	0.007	0.4	0.2	O K
2880 min Summer	15.566	0.006	0.4	0.2	O K
4320 min Summer	15.564	0.004	0.2	0.1	O K
5760 min Summer	15.564	0.004	0.2	0.1	O K
7200 min Summer	15.563	0.003	0.2	0.1	O K
8640 min Summer	15.563	0.003	0.2	0.1	O K
10080 min Summer	15.562	0.002	0.1	0.1	O K
15 min Winter	15.618	0.058	2.9	1.7	O K
30 min Winter	15.626	0.066	2.9	2.0	O K
60 min Winter	15.617	0.057	2.9	1.7	O K
120 min Winter	15.601	0.041	2.4	1.2	O K
180 min Winter	15.592	0.032	1.8	1.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	125.658	0.0	13
30 min Summer	85.511	0.0	21
60 min Summer	55.544	0.0	38
120 min Summer	34.763	0.0	68
180 min Summer	25.981	0.0	98
240 min Summer	20.983	0.0	128
360 min Summer	15.545	0.0	188
480 min Summer	12.541	0.0	248
600 min Summer	10.607	0.0	308
720 min Summer	9.245	0.0	368
960 min Summer	7.435	0.0	490
1440 min Summer	5.457	0.0	732
2160 min Summer	3.995	0.0	1100
2880 min Summer	3.197	0.0	1460
4320 min Summer	2.331	0.0	2200
5760 min Summer	1.863	0.0	2888
7200 min Summer	1.567	0.0	3600
8640 min Summer	1.360	0.0	4272
10080 min Summer	1.207	0.0	5064
15 min Winter	125.658	0.0	13
30 min Winter	85.511	0.0	22
60 min Winter	55.544	0.0	38
120 min Winter	34.763	0.0	68
180 min Winter	25.981	0.0	100

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Access Road Perm Paving	
Date 05/11/2021 10:43 File 020.5762 Plot 8 Perm Paving	Designed by C Pritchard Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	15.587	0.027	1.5	0.8	O K
360 min Winter	15.580	0.020	1.2	0.6	O K
480 min Winter	15.577	0.017	1.0	0.5	O K
600 min Winter	15.574	0.014	0.8	0.4	O K
720 min Winter	15.572	0.012	0.7	0.4	O K
960 min Winter	15.570	0.010	0.6	0.3	O K
1440 min Winter	15.567	0.007	0.4	0.2	O K
2160 min Winter	15.565	0.005	0.3	0.2	O K
2880 min Winter	15.564	0.004	0.2	0.1	O K
4320 min Winter	15.563	0.003	0.2	0.1	O K
5760 min Winter	15.563	0.003	0.2	0.1	O K
7200 min Winter	15.562	0.002	0.1	0.1	O K
8640 min Winter	15.562	0.002	0.1	0.1	O K
10080 min Winter	15.562	0.002	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	20.983	0.0	130
360 min Winter	15.545	0.0	190
480 min Winter	12.541	0.0	246
600 min Winter	10.607	0.0	310
720 min Winter	9.245	0.0	370
960 min Winter	7.435	0.0	500
1440 min Winter	5.457	0.0	736
2160 min Winter	3.995	0.0	1108
2880 min Winter	3.197	0.0	1456
4320 min Winter	2.331	0.0	2132
5760 min Winter	1.863	0.0	3080
7200 min Winter	1.567	0.0	3624
8640 min Winter	1.360	0.0	4416
10080 min Winter	1.207	0.0	5208

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Plot 8 Access Road Perm Paving	
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File 020.5762 Plot 8 Perm Paving	Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.013

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

0 4 0.013

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Lancaster Court	Land West of Fontwell Ave	
Fareham	8 Unit Development	
Hampshire, PO15 5TU	Plot 8 Access Road Perm Paving	
Date 05/11/2021 10:43	Designed by C Pritchard	
File 020.5762 Plot 8 Perm Paving	Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 16.080

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.30800	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	3.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	15.560	Membrane Depth (m)	0

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Access Road Perm Paving	
Date 05/11/2021 10:41 File 020.5762 Access Road Perm	Designed by C Pritchard Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

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

Half Drain Time : 11 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	15.742	0.042	9.4	6.6	O K
30 min Summer	15.750	0.050	11.3	8.0	O K
60 min Summer	15.752	0.052	11.3	8.2	O K
120 min Summer	15.744	0.044	10.0	7.0	O K
180 min Summer	15.738	0.038	8.5	6.0	O K
240 min Summer	15.733	0.033	7.4	5.2	O K
360 min Summer	15.726	0.026	5.9	4.2	O K
480 min Summer	15.722	0.022	5.0	3.5	O K
600 min Summer	15.719	0.019	4.3	3.0	O K
720 min Summer	15.717	0.017	3.9	2.7	O K
960 min Summer	15.714	0.014	3.1	2.2	O K
1440 min Summer	15.711	0.011	2.4	1.7	O K
2160 min Summer	15.708	0.008	1.8	1.2	O K
2880 min Summer	15.706	0.006	1.4	1.0	O K
4320 min Summer	15.705	0.005	1.1	0.7	O K
5760 min Summer	15.704	0.004	0.8	0.6	O K
7200 min Summer	15.703	0.003	0.7	0.5	O K
8640 min Summer	15.703	0.003	0.6	0.4	O K
10080 min Summer	15.702	0.002	0.5	0.4	O K
15 min Winter	15.747	0.047	10.7	7.5	O K
30 min Winter	15.755	0.055	11.3	8.7	O K
60 min Winter	15.752	0.052	11.3	8.2	O K
120 min Winter	15.741	0.041	9.2	6.4	O K
180 min Winter	15.733	0.033	7.4	5.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	125.658	0.0	13
30 min Summer	85.511	0.0	21
60 min Summer	55.544	0.0	38
120 min Summer	34.763	0.0	68
180 min Summer	25.981	0.0	98
240 min Summer	20.983	0.0	130
360 min Summer	15.545	0.0	190
480 min Summer	12.541	0.0	250
600 min Summer	10.607	0.0	310
720 min Summer	9.245	0.0	370
960 min Summer	7.435	0.0	492
1440 min Summer	5.457	0.0	734
2160 min Summer	3.995	0.0	1104
2880 min Summer	3.197	0.0	1448
4320 min Summer	2.331	0.0	2172
5760 min Summer	1.863	0.0	2936
7200 min Summer	1.567	0.0	3664
8640 min Summer	1.360	0.0	4392
10080 min Summer	1.207	0.0	5136
15 min Winter	125.658	0.0	14
30 min Winter	85.511	0.0	23
60 min Winter	55.544	0.0	40
120 min Winter	34.763	0.0	70
180 min Winter	25.981	0.0	102

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Innovyze	Source Control 2020.1.3	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	15.727	0.027	6.2	4.4	O K
360 min Winter	15.721	0.021	4.8	3.3	O K
480 min Winter	15.717	0.017	3.9	2.7	O K
600 min Winter	15.715	0.015	3.3	2.3	O K
720 min Winter	15.713	0.013	2.9	2.0	O K
960 min Winter	15.710	0.010	2.3	1.6	O K
1440 min Winter	15.708	0.008	1.8	1.2	O K
2160 min Winter	15.706	0.006	1.3	0.9	O K
2880 min Winter	15.705	0.005	1.1	0.7	O K
4320 min Winter	15.703	0.003	0.7	0.5	O K
5760 min Winter	15.703	0.003	0.6	0.4	O K
7200 min Winter	15.702	0.002	0.5	0.3	O K
8640 min Winter	15.702	0.002	0.5	0.3	O K
10080 min Winter	15.702	0.002	0.4	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	20.983	0.0	132
360 min Winter	15.545	0.0	192
480 min Winter	12.541	0.0	252
600 min Winter	10.607	0.0	308
720 min Winter	9.245	0.0	374
960 min Winter	7.435	0.0	498
1440 min Winter	5.457	0.0	710
2160 min Winter	3.995	0.0	1092
2880 min Winter	3.197	0.0	1492
4320 min Winter	2.331	0.0	2152
5760 min Winter	1.863	0.0	2840
7200 min Winter	1.567	0.0	3664
8640 min Winter	1.360	0.0	4432
10080 min Winter	1.207	0.0	5048

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Access Road Perm Paving	
Date 05/11/2021 10:41 File 020.5762 Access Road Perm	Designed by C Pritchard Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.054

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

0 4 0.054

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Lancaster Court Fareham Hampshire, PO15 5TU	Land West of Fontwell Ave 8 Unit Development Access Road Perm Paving	
Date 05/11/2021 10:41 File 020.5762 Access Road Perm	Designed by C Pritchard Checked by C Longhurst	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 16.220

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.30800	Width (m)	52.8
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	146.7	Slope (1:X)	0.0
Safety Factor	4.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	15.700	Membrane Depth (m)	0

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Innovyze	Source Control 2020.1.3	

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

Half Drain Time : 187 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	14.508	0.318	0.7	8.2	O K
30 min Summer	14.609	0.419	0.8	10.7	O K
60 min Summer	14.702	0.512	0.8	13.1	O K
120 min Summer	14.761	0.571	0.8	14.6	O K
180 min Summer	14.768	0.578	0.8	14.8	O K
240 min Summer	14.762	0.572	0.8	14.7	O K
360 min Summer	14.745	0.555	0.8	14.2	O K
480 min Summer	14.724	0.534	0.8	13.7	O K
600 min Summer	14.701	0.511	0.8	13.1	O K
720 min Summer	14.678	0.488	0.8	12.5	O K
960 min Summer	14.632	0.442	0.8	11.3	O K
1440 min Summer	14.548	0.358	0.7	9.2	O K
2160 min Summer	14.443	0.253	0.7	6.5	O K
2880 min Summer	14.363	0.173	0.7	4.4	O K
4320 min Summer	14.266	0.076	0.6	1.9	O K
5760 min Summer	14.237	0.047	0.6	1.2	O K
7200 min Summer	14.229	0.039	0.5	1.0	O K
8640 min Summer	14.224	0.034	0.4	0.9	O K
10080 min Summer	14.221	0.031	0.4	0.8	O K
15 min Winter	14.548	0.358	0.7	9.2	O K
30 min Winter	14.664	0.474	0.8	12.2	O K
60 min Winter	14.773	0.583	0.8	15.0	O K
120 min Winter	14.849	0.659	0.9	16.9	O K
180 min Winter	14.860	0.670	0.9	17.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	125.658	0.0	18
30 min Summer	85.511	0.0	33
60 min Summer	55.544	0.0	62
120 min Summer	34.763	0.0	120
180 min Summer	25.981	0.0	152
240 min Summer	20.983	0.0	184
360 min Summer	15.545	0.0	252
480 min Summer	12.541	0.0	322
600 min Summer	10.607	0.0	390
720 min Summer	9.245	0.0	458
960 min Summer	7.435	0.0	594
1440 min Summer	5.457	0.0	852
2160 min Summer	3.995	0.0	1232
2880 min Summer	3.197	0.0	1584
4320 min Summer	2.331	0.0	2248
5760 min Summer	1.863	0.0	2936
7200 min Summer	1.567	0.0	3672
8640 min Summer	1.360	0.0	4400
10080 min Summer	1.207	0.0	5120
15 min Winter	125.658	0.0	18
30 min Winter	85.511	0.0	32
60 min Winter	55.544	0.0	60
120 min Winter	34.763	0.0	118
180 min Winter	25.981	0.0	170

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	14.851	0.661	0.9	17.0	O K
360 min Winter	14.829	0.639	0.9	16.4	O K
480 min Winter	14.796	0.606	0.8	15.5	O K
600 min Winter	14.760	0.570	0.8	14.6	O K
720 min Winter	14.724	0.534	0.8	13.7	O K
960 min Winter	14.654	0.464	0.8	11.9	O K
1440 min Winter	14.529	0.339	0.7	8.7	O K
2160 min Winter	14.383	0.193	0.7	4.9	O K
2880 min Winter	14.282	0.092	0.6	2.4	O K
4320 min Winter	14.232	0.042	0.5	1.1	O K
5760 min Winter	14.224	0.034	0.4	0.9	O K
7200 min Winter	14.219	0.029	0.3	0.7	O K
8640 min Winter	14.215	0.025	0.3	0.6	O K
10080 min Winter	14.212	0.022	0.3	0.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	20.983	0.0	194
360 min Winter	15.545	0.0	270
480 min Winter	12.541	0.0	348
600 min Winter	10.607	0.0	422
720 min Winter	9.245	0.0	496
960 min Winter	7.435	0.0	636
1440 min Winter	5.457	0.0	908
2160 min Winter	3.995	0.0	1276
2880 min Winter	3.197	0.0	1612
4320 min Winter	2.331	0.0	2204
5760 min Winter	1.863	0.0	2936
7200 min Winter	1.567	0.0	3672
8640 min Winter	1.360	0.0	4400
10080 min Winter	1.207	0.0	5016

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.325	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.037

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

0 4 0.037

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Model Details

Storage is Online Cover Level (m) 15.950

Cellular Storage Structure

Invert Level (m) 14.190 Safety Factor 4.0
Infiltration Coefficient Base (m/hr) 0.30800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.30800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	27.0	27.0	0.800	27.0	43.6	0.801	0.0	43.6

Report Presented by:

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