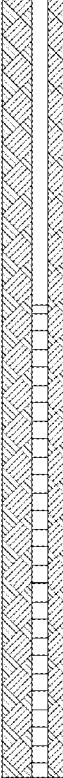


[illegible]

Exploratory Hole ID:		Client: Cordage Asset Management Ltd				 OPUS www.opusinternational.co.uk					
TP2		Site: Former Kings Beach Hotel, Pagham									
Job No:						Start Date:		End Date:			
E-F2278.00						20/03/2018		20/03/2018			
Drilling Equipment/ Excavation Method:				Co-ords:		Backfill Date:		Field Records:			
JCB 3CX						20/03/2018		CGJ			
				Ground Level (mAOD):		Logged:		Chkd:			
						CGJ		DRC			
								DRC			
Strata Description				Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Made Ground: Comprising soft consistency dark brown silty sandy Clay. Sand is fine to medium grained. Frequent roots and rootlets. Rare plastic sheeting. Soft consistency light brown/orange brown silty sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)				0.20							
Soft consistency light brown/orange brown gravelly silty sandy CLAY. Sand is fine to coarse grained. Gravel is subangular to subrounded fine to medium of flint. (River Terrace Deposits)				1.00							
				2.25							
Remarks: 1) No groundwater encountered. 2) Descriptions are reported in accordance with the guidance stated in BS 5930:2015 incorporating the requirements of BS EN ISO 14688-2:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003.							Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample ES - Environmental Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading		
Sheet:							Sheet 1 of 1				

Exploratory Hole ID: TP3	Client: Cordage Asset Management Ltd					 OPUS www.opusinternational.co.uk						
Job No: E-F2278.00	Site: Former Kings Beach Hotel, Pagham											
Drilling Equipment/ Excavation Method: JCB 3CX					Co-ords:		Start Date: 20/03/2018		End Date: 20/03/2018			
					Ground Level (mAOD):		Backfill Date: 20/03/2018		Field Records: CGJ			
							Logged: CGJ		Chkd: DRC		Appr: DRC	
Strata Description					Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Made Ground: Comprising soft consistency dark brown silty sandy Clay. Sand is fine to medium grained. Frequent roots and rootlets.					0.20							
Soft consistency light brown/orange brown silty sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)												
Soft consistency orange brown gravelly silty sandy CLAY. Sand is fine to coarse grained. Gravel is subangular to subrounded fine to medium of flint. (River Terrace Deposits)					1.20							
					2.50							
Remarks: 1) Groundwater seepage noted in base of pit. 2) Descriptions are reported in accordance with the guidance stated in BS 5930:2015 incorporating the requirements of BS EN ISO 14688-2:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003.								Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample ES - Environmental Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading		
								Sheet: Sheet 1 of 1				

SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Former Kings Beach Hotel Pagham

Job No: E-F2278.00

Trial Hole: TP1 Run 1

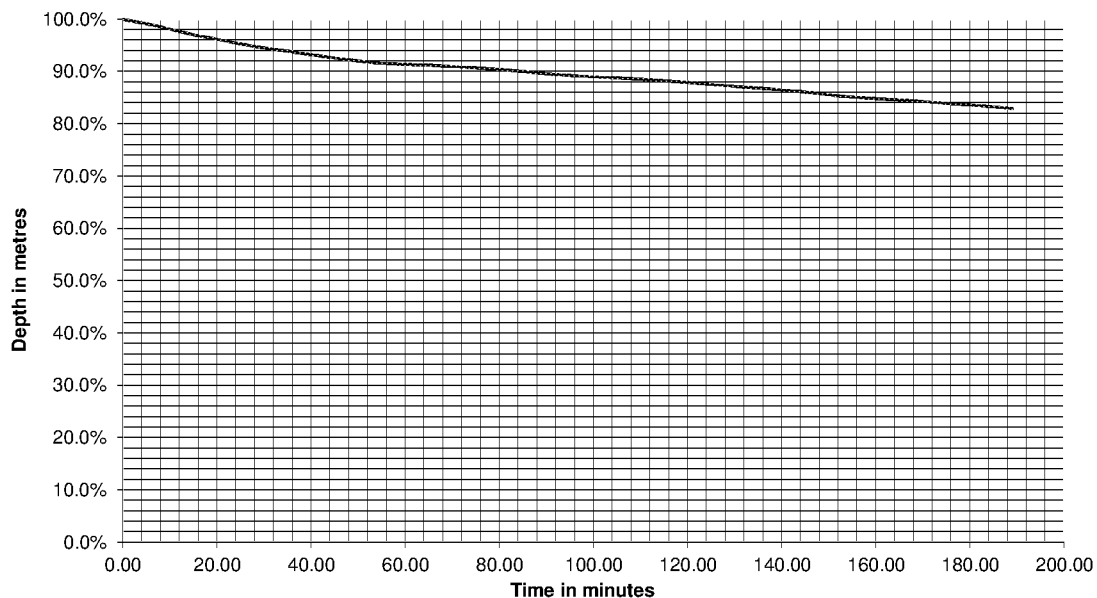
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	0.850	1.15	100.0%
1.00	0.852	1.15	99.8%
2.00	0.854	1.15	99.7%
3.00	0.856	1.14	99.5%
4.00	0.858	1.14	99.3%
6.00	0.862	1.14	99.0%
15.00	0.884	1.12	97.0%
19.00	0.892	1.11	96.3%
22.00	0.898	1.10	95.8%
26.00	0.906	1.09	95.1%
30.00	0.913	1.09	94.5%
35.00	0.920	1.08	93.9%
40.00	0.928	1.07	93.2%
54.00	0.946	1.05	91.7%
67.00	0.952	1.05	91.1%
82.00	0.962	1.04	90.3%
94.00	0.973	1.03	89.3%
112.00	0.983	1.02	88.4%
127.00	0.995	1.01	87.4%
143.00	1.008	0.99	86.3%
155.00	1.021	0.98	85.1%
173.00	1.033	0.97	84.1%
189.00	1.046	0.95	83.0%
189.00	1.046	0.95	83.0%
189.00	1.046	0.95	83.0%
189.00	1.046	0.95	83.0%
189.00	1.046	0.95	83.0%
189.00	1.046	0.95	83.0%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to graph sheet for calculation

Pit Size	Time in mins
Length	75%
Width	25%
Depth	

Infiltration Rate from 75%-25%

Permeability Graph TP1 (run 1)



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Former Kings Beach Hotel Pagham

Job No: E-F2278.00

Trial Hole: TP2 Run 1

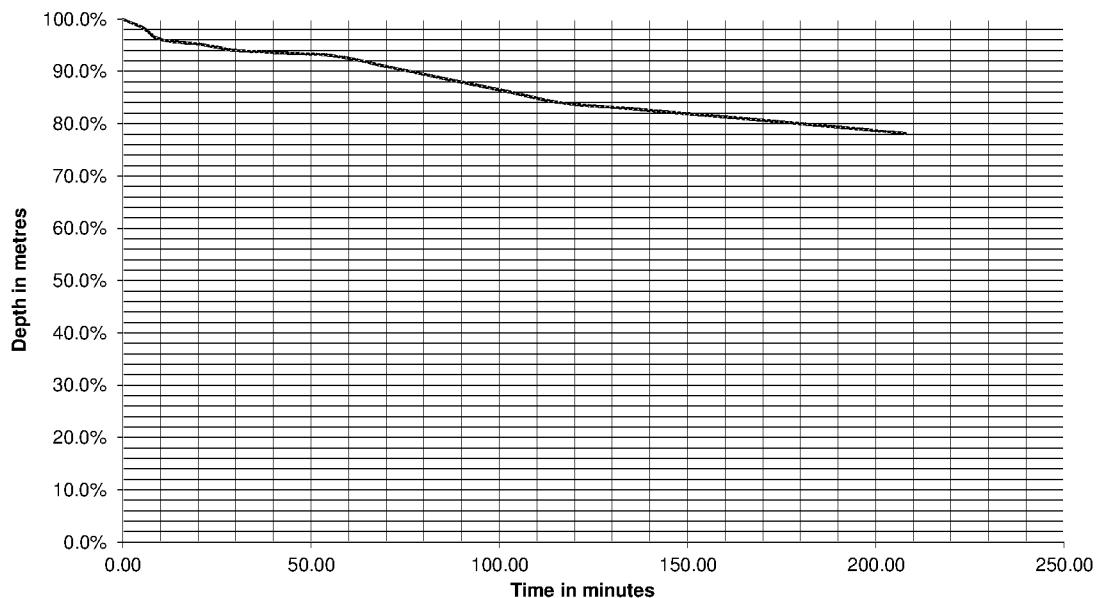
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	0.642	1.61	100.0%
5.00	0.666	1.58	98.5%
9.00	0.700	1.55	96.4%
13.00	0.710	1.54	95.8%
16.00	0.714	1.54	95.5%
20.00	0.718	1.53	95.3%
25.00	0.728	1.52	94.7%
30.00	0.738	1.51	94.0%
45.00	0.747	1.50	93.5%
57.00	0.756	1.49	92.9%
72.00	0.792	1.46	90.7%
87.00	0.828	1.42	88.4%
102.00	0.864	1.39	86.2%
117.00	0.900	1.35	84.0%
133.00	0.915	1.34	83.0%
148.00	0.931	1.32	82.0%
164.00	0.946	1.30	81.1%
179.00	0.962	1.29	80.1%
194.00	0.978	1.27	79.1%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%
208.00	0.993	1.26	78.2%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to graph sheet for calculation

Pit Size	Time in mins
Length	2.60
Width	0.70
Depth	2.25

Infiltration Rate from 75%-25%

Permeability Graph TP2 (run 1)



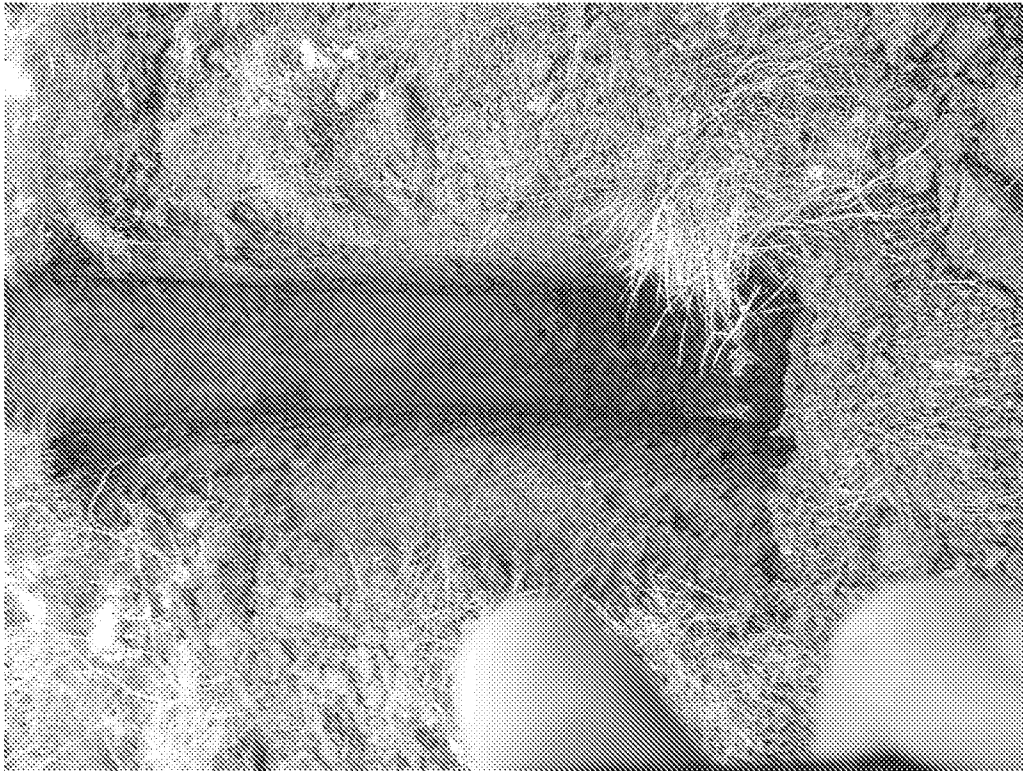
Trial Hole: TP3 Run 1



Photograph 1: TP1



Photograph 2: TP2



Photograph 3: TP3



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SITE INVESTIGATIONS

CONDITIONS AND LIMITATIONS

1. The report is confidential to the clients stated in the report and has been prepared to their instructions for their own purposes and it is not permitted to disclose this report to other parties (except NHBC, Local Authority, the Client's own Solicitors and Professional Advisers) without the prior consent of Opus International Consultants (UK) Ltd.
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3. No liability for the contents of this report is accepted to any parties other than the client stated in the report. No parties other than the client stated in the report should rely upon this report.
4. Attention is drawn to the fact that, whilst every effort is made to ensure the accuracy of the data and any conclusions derived from it, the possibility exists of variations in ground conditions around and between trial pits. No liability can be accepted for such variations or for agreed sampling rates/trial hole frequency.
5. Unless specifically stated otherwise in the report, any recommendations for works given in the report are outline only and are to be confirmed or modified as appropriate at detailed design stage.
6. No liability can be accepted for any services or other below ground items unless clearly shown on a plan to us in advance of any site works.
7. In accepting instructions to carry out site investigations it is assumed by us that our clients have all necessary permissions from existing owners and/or other authorities for such works to proceed. No liability is accepted for any claims arising as a result of anything contrary to this.
8. It is also assumed that a suitable clear access to the site is available for the required equipment and plant.
9. All holes are normally back-filled with excavated material compacted by its own weight only. Any excess spoil will be spread evenly around the direct area of excavation.
10. No chemical analysis of samples will be carried out unless specifically stated otherwise in the text of this report. Where fill, disturbed soil or an unfavourable earlier land usage is identified by the investigation the client is advised to have chemical analysis carried out subsequently. In any event no liability is accepted in respect of pollution. Similarly for radon and naturally occurring chemicals and gases.
11. Unless stated otherwise any desk study into the site history will be limited to information readily available at the Local Reference Library.
12. Under the Construction (Design & Management) Regulations latest edition, the Client has obligations for ensuring Health and Safety arising from any construction work. If it is proposed to proceed with construction work based upon information or recommendations contained in this report, these regulations probably apply. Further details of any issues arising from our report or the Clients obligations generally are available on request.
13. Unless dealt with more specifically above the Association of Consulting Engineers Conditions of Engagement, Short Form Agreement 2002 applies.
14. Laboratory testing where carried out is usually undertaken by sub-contract laboratories. No liability is accepted arising from any errors or omissions on the part of such laboratories.

Appendix E

Magic Map Groundwater Mapping

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- ☐ Access
- ☐ Administrative Geographies
- ☐ Countryside Stewardship Targeting & Scoring Layers
- ☐ Designations
- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☒ Landscape
 - ☒ Geology and Soils
 - ☒ Aquifer Designation Map (Bedrock) (England)
 - Principal
 - Secondary A
 - Secondary B
 - Secondary (undifferentiated)
 - Unproductive
 - ☐ Aquifer Designation Map (Superficial Drift) (England)
 - ☐ Groundwater Vulnerability Map (England)
 - ☐ Geological Places to Visit (England)
 - ☐ Geological Descriptions (England)
 - ☐ Soilscape (England)
 - ☐ Landscape Classifications

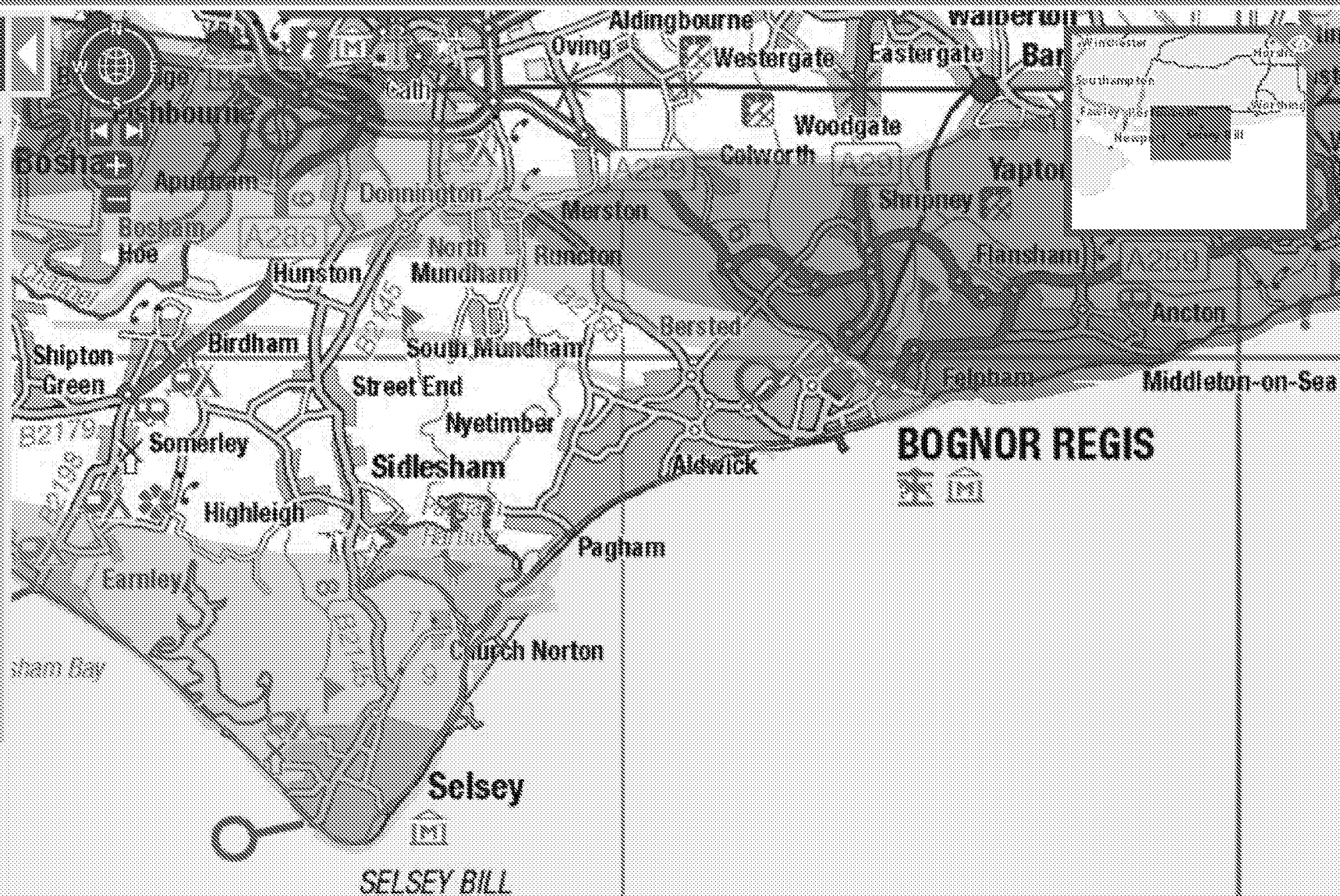


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- ☐ Access
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- ☐ Countryside Stewardship Targeting & Scoring Layers
- ☐ Designations
- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☒ Landscape
 - ☒ Geology and Soils
 - ☐ Aquifer Designation Map (Bedrock) (England)
 - ☒ Aquifer Designation Map (Superficial Drift) (England)
 - Principal
 - Secondary A
 - Secondary B
 - Secondary (undifferentiated)
 - Unknown (lakes+landslip)
 - Unproductive
 - ☐ Groundwater Vulnerability Map (England)
 - ☐ Geological Places to Visit (England)
 - ☐ Geological Descriptions (England)
 - ☐ Soilscape (England)

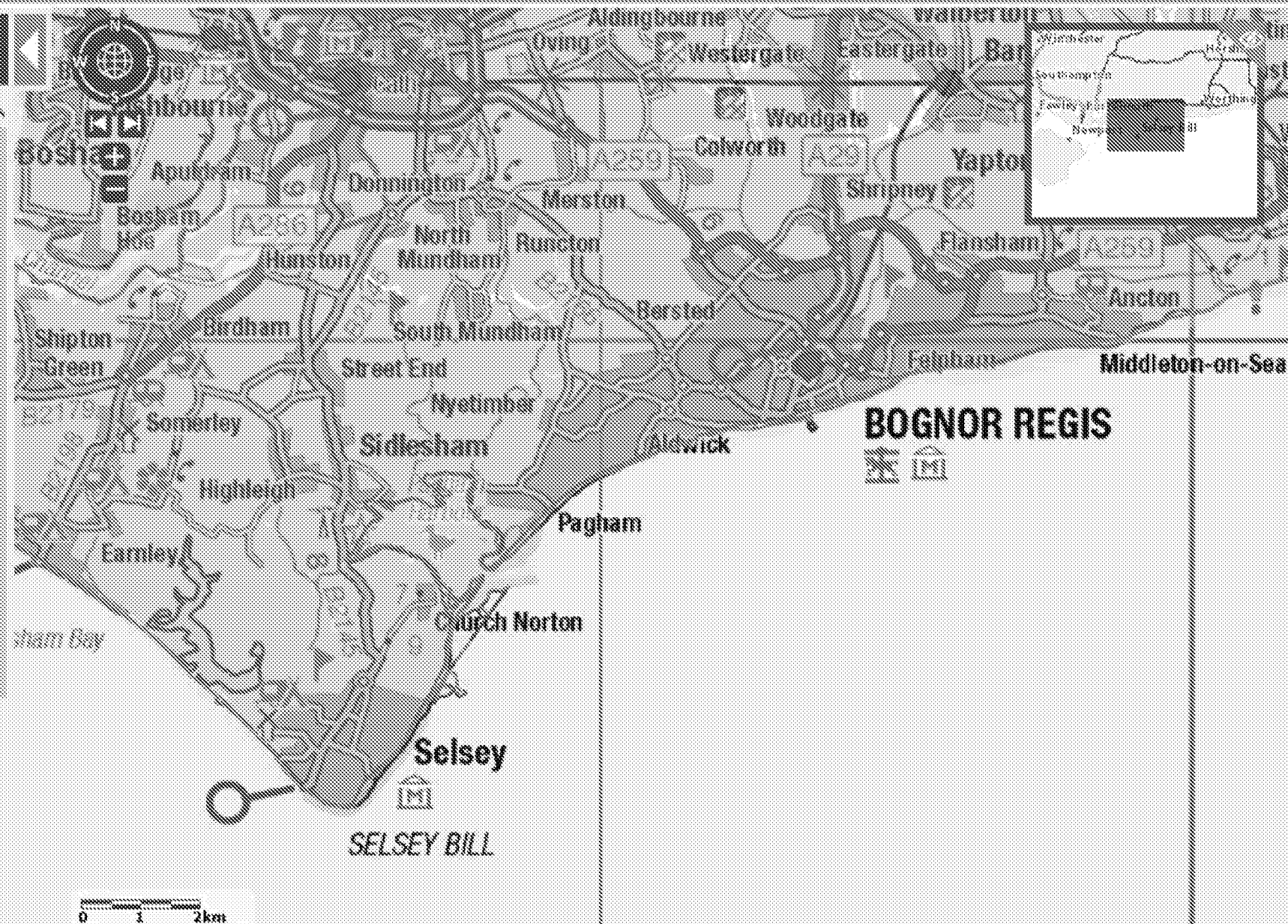


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- ☐ Access
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- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☒ Landscape
 - ☒ Geology and Soils
 - ☐ Aquifer Designation Map (Bedrock) (England)
 - ☐ Aquifer Designation Map (Superficial Drift) (England)
 - ☒ Groundwater Vulnerability Map (England)
 - Major Aquifer High
 - Major Aquifer Intermediate
 - Major Aquifer Low
 - Minor Aquifer High
 - Minor Aquifer Intermediate
 - Minor Aquifer Low
 - ☐ Geological Places to Visit (England)
 - ☐ Geological Descriptions (England)
 - ☐ Soilscape (England)

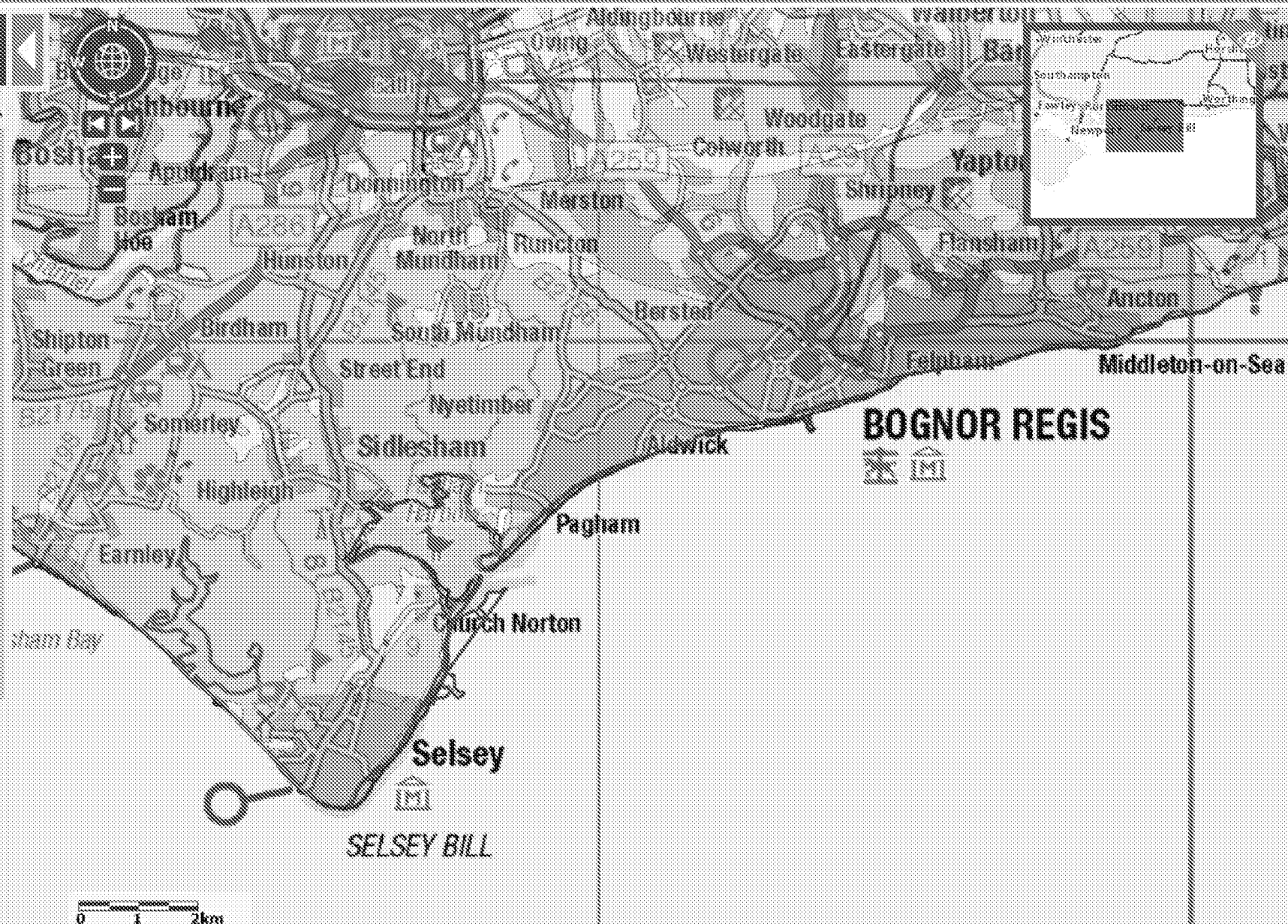
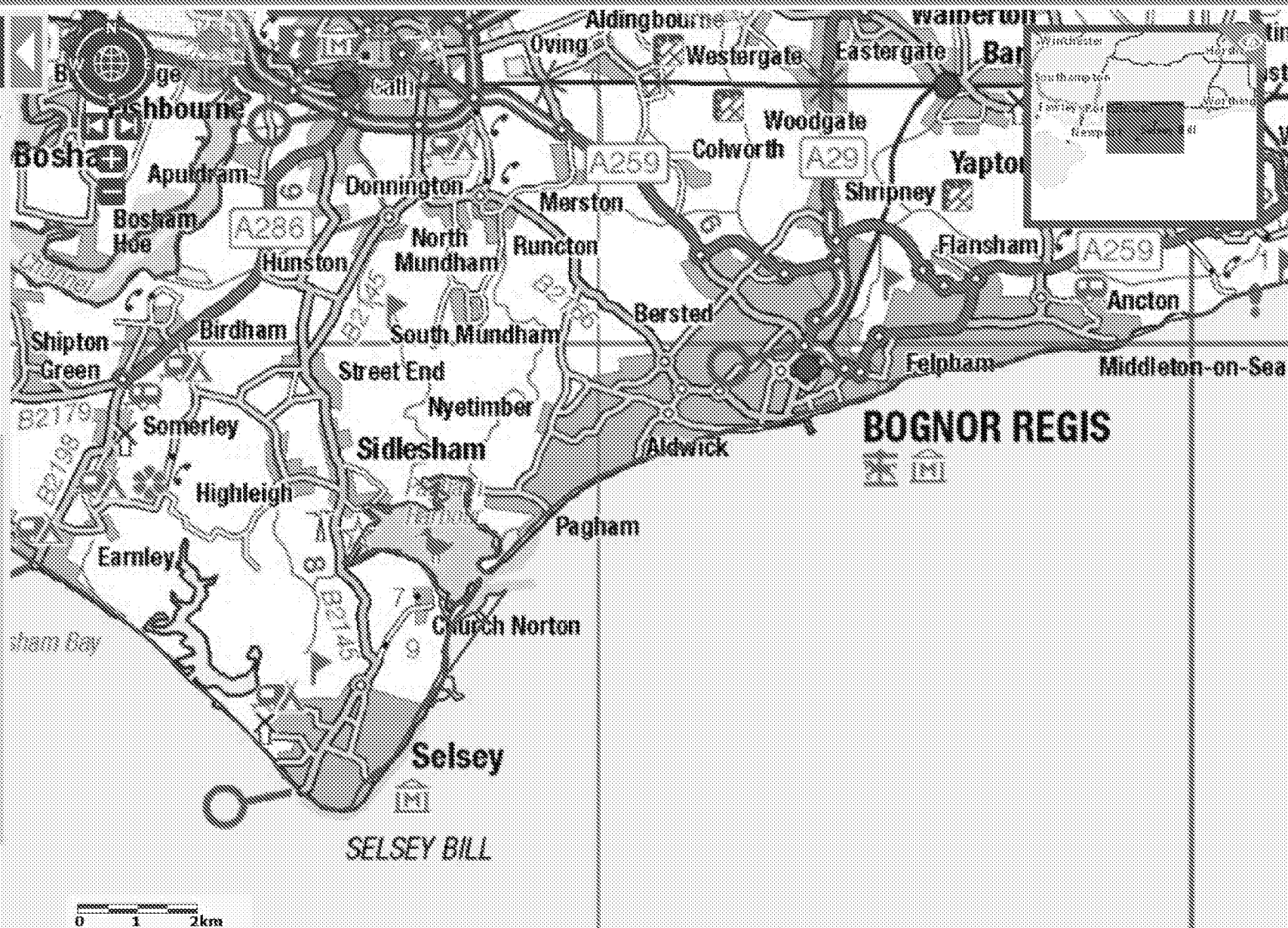


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- ☐ Upland Experiment Areas (England) ⓘ
- ☐ Objective 1 Areas (England) ⓘ
- ☐ Objective 2 Areas (England) ⓘ
- ☐ Drinking Water Protected Areas (Surface Water) (England) ⓘ
- ☐ Drinking Water Safeguard Zones (Surface Water) (England) ⓘ
- ☐ Drinking Water Safeguard Zones (Groundwater) (England) ⓘ
- ☒ Source Protection Zones merged (England) ⓘ
 - ☒ Zone I - Inner Protection Zone
 - ☒ Zone I - Subsurface Activity
 - ☒ Zone II - Outer Protection Zone
 - ☒ Zone II - Subsurface Activity
 - ☒ Zone III - Total Catchment
 - ☒ Zone III - Subsurface Activity
 - ☒ Zone of Special Interest
- ☐ Marine Designations
- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☐ Landscape
- ☐ Marine
- ☐ Aerial Photography
- ☒ Background Mapping



Appendix F

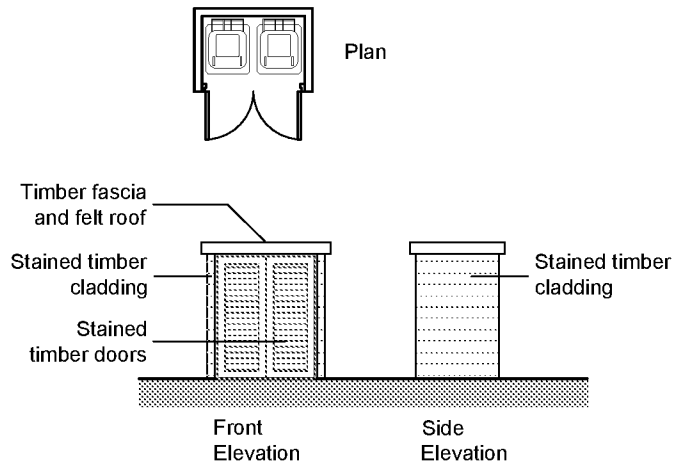
Greenfield Run-off

The Stilwell Partnership		Page 1
Satelliet House 2 Nexus Park Ash Vale GU12 5QE	Kings Beach Hotel	
Date 20/06/2018 13:24 File	Designed by A Johnson Checked by D Brooke	
Micro Drainage Source Control 2016.1		
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 1 Soil 0.450 Area (ha) 0.250 Urban 0.500 SAAR (mm) 800 Region Number Region 7 Results 1/s QBAR Rural 1.3 QBAR Urban 2.5 Q1 year 2.1 Q1 year 2.1 Q30 years 4.8 Q100 years 5.8		
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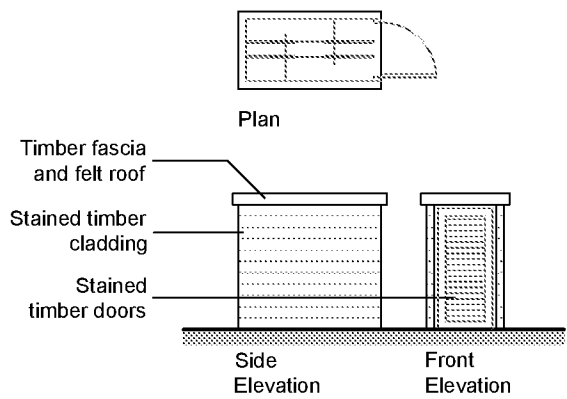
Appendix G

Proposed Site Layout

BIN STORE DETAILS



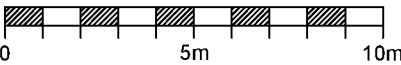
CYCLE STORE DETAILS



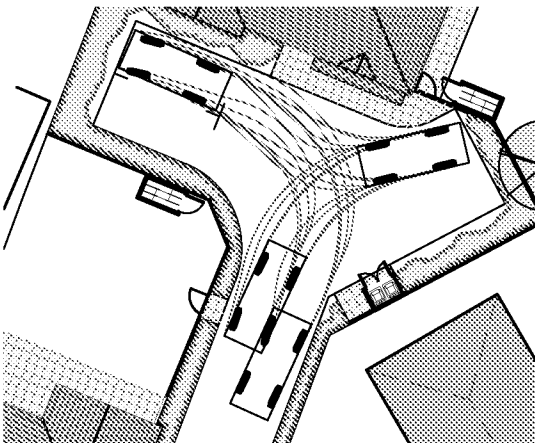
NOTES

- GENERAL NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE OTHER RELEVANT CONSULTANT'S DRAWINGS.
 2. ALL FINISHES ARE TO CONFORM TO THE CURRENT BUILDING REGULATIONS.
 3. REFER TO A SEPARATE DOCUMENT FOR THE DESIGNER'S RISK ASSESSMENT.
 4. ALL WORKS OR MATERIALS INDICATED ON THIS DRAWING ARE TO BE TO THE LATEST RELEVANT BRITISH STANDARDS AND CARRIED OUT IN ACCORDANCE WITH THE BRITISH STANDARDS CODES OF PRACTICE OR RECOGNIZED INSTITUTE OR TRADE ASSOCIATION RECOMMENDATIONS AND PUBLICATIONS.

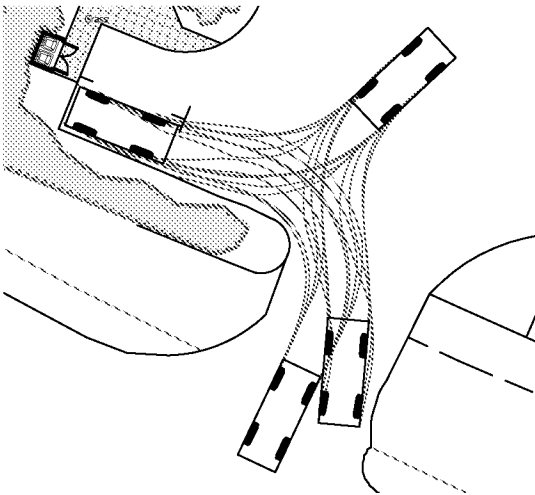
1:200 scale



Bungalow 1



Bungalow 2



P3	Jan 2018	Swept paths amended	LW	
P2	Dec 2017	Swept path added, boundary amended	LW	
Revision	Date	Description	Dwn	Chkd



Lansdowne House
25-26 Hampshire Terrace
Portsmouth PO1 2QF
Hampshire England
Tel: (023) 92 755 333
E-Mail: admin@plcarchitects.com
Web: www.plcarchitects.com

Client:

Project:

Proposed Mixed Use Development at
The Former King's Beach Hotel, Pagham

Drawing Title:

Proposed Site Layout

Drawn By	Date	Checked By	Date	Approved By	Date
KW	Dec 17				
Drawing No.	Revision	Scale			
17.3030.100	P3	1:200@A2			

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SCALING ONLY FOR LOCAL AUTHORITY PURPOSES

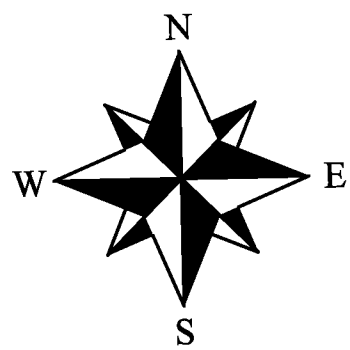
Appendix H

Drainage Layout

Drainage Construction Notes

1. All materials and workmanship related to private sewers shall be in accordance with Part H of the Building Regulation and BSEN752
2. All materials and workmanship related to adoptable sewers shall be in accordance with the Sewers For Adoption 7th Edition as published by the Water Services Association and any subsequent revisions shown by SHW.
3. All sustainable drainage (SuDS) to be in accordance with CIRIA C753 The SuDS Manual.
4. Gully grating and aco channel shall be ductile iron to BS EN124, Class D400, and kitemarked.
5. Manhole covers and frames to be ductile iron to BS EN124 Class D400 in carriageways and Class B125 in verges unless otherwise specified. Covers to be kitemarked and badged "SW" or "FW" as appropriate. Brick/brick infilled manhole covers are not to be used on adoptable manholes.
6. All clayware pipes to be vitrified clay to BS EN 295 or BS 85 and of minimum strength Class 120 or Extra Strength respectively.
7. All plastic pipes to be PVC-U in accordance with BS EN 1401.
8. All carrier drains under carriageway to be constructed with BEDDING TYPES S or Z depending on depth of cover as described on Typical Drainage Details drawing.
9. All pipe connections to be made soffit to soffit.
10. All pipework with less than 1.2m cover within roads or parking areas to have concrete bed & surround.
11. If the contractor finds any discrepancies in the information provided then he must notify the engineer immediately before any materials are ordered or works undertaken
12. All underslab drainage at minimum 1 in 40 fall unless noted otherwise.
13. All dimensions in millimetres unless otherwise stated.
14. All patios to drain away from properties.

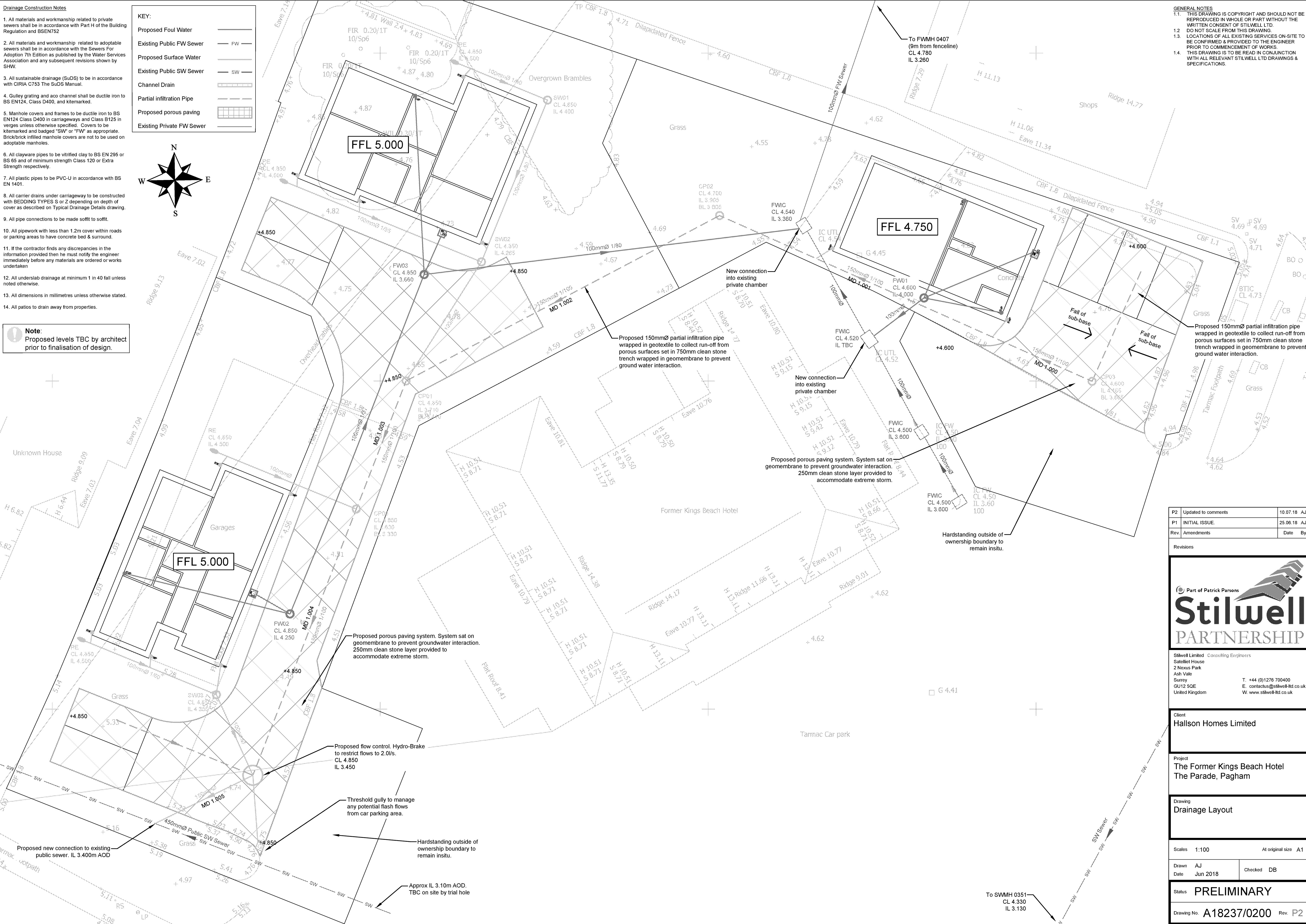
KEY:	
Proposed Foul Water	-----
Existing Public FW Sewer	--- FW ---
Proposed Surface Water	-----
Existing Public SW Sewer	--- SW ---
Channel Drain	=====
Partial infiltration Pipe	- - - - -
Proposed porous paving	=====
Existing Private FW Sewer	-----



Note:
Proposed levels TBC by architect prior to finalisation of design.

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Appendix J

MicroDrainage Calculations

The Stilwell Partnership		Page 1
Satelliet House 2 Nexus Park Ash Vale GU12 5QE	Kings Beach Hotel Pagham	
Date 02/07/2018 09:43 File 01 MD Model 02.07.18.mdx	Designed by A Johnson Checked by D Brooke	
Micro Drainage Network 2016.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.400	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	0.450
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

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
1.000	6.500	0.065	100.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	20.000	0.200	100.0	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	19.500	0.195	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	8.000	0.080	100.0	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	18.500	0.185	100.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	5.000	0.050	100.0	0.028	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.11	4.165	0.017	0.0	0.0	0.0	1.00	17.8	2.3
1.001	50.00	5.44	4.100	0.029	0.0	0.0	0.0	1.00	17.8	3.9
1.002	50.00	5.76	3.900	0.029	0.0	0.0	0.0	1.00	17.8	3.9
1.003	50.00	5.90	3.705	0.049	0.0	0.0	0.0	1.00	17.8	6.6
1.004	50.00	6.20	3.625	0.055	0.0	0.0	0.0	1.00	17.8	7.4
1.005	50.00	6.29	3.440	0.083	0.0	0.0	0.0	1.00	17.8	11.2

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/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 Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	6

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The Stilwell Partnership		Page 2
Satelliet House 2 Nexus Park Ash Vale GU12 5QE	Kings Beach Hotel Pagham	
Date 02/07/2018 09:43 File 01 MD Model 02.07.18.mdx	Designed by A Johnson Checked by D Brooke	
Micro Drainage Network 2016.1		

Simulation Criteria for Storm

Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type Summer
Return Period (years)	2	Cv (Summer) 0.750
Region England and Wales		Cv (Winter) 0.840
M5-60 (mm)	20.000	Storm Duration (mins) 30
Ratio R	0.400	

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The Stilwell Partnership		Page 3
Satelliet House 2 Nexus Park Ash Vale GU12 5QE	Kings Beach Hotel Pagham	
Date 02/07/2018 09:43 File 01 MD Model 02.07.18.mdx	Designed by A Johnson Checked by D Brooke	
Micro Drainage Network 2016.1		

Online Controls for Storm

Hydro-Brake Optimum® Manhole: 6, DS/PN: 1.005, Volume (m³): 1.9

Unit Reference	MD-SHE-0061-2000-1450-2000
Design Head (m)	1.450
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	61
Invert Level (m)	3.440
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.450	2.0
Flush-Flo™	0.270	1.6
Kick-Flo®	0.549	1.3
Mean Flow over Head Range	-	1.6

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)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.8	3.000	2.8	7.000	4.1
0.200	1.6	1.400	2.0	3.500	3.0	7.500	4.3
0.300	1.6	1.600	2.1	4.000	3.2	8.000	4.4
0.400	1.5	1.800	2.2	4.500	3.4	8.500	4.5
0.500	1.4	2.000	2.3	5.000	3.5	9.000	4.7
0.600	1.3	2.200	2.4	5.500	3.7	9.500	4.8
0.800	1.5	2.400	2.5	6.000	3.9		
1.000	1.7	2.600	2.6	6.500	4.0		

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Storage Structures for Storm

Complex Manhole: 1, DS/PN: 1.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	14.2
Membrane Percolation (mm/hr)	1000	Length (m)	14.2
Max Percolation (l/s)	56.0	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.220	Cap Volume Depth (m)	0.250

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	6.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	4.165	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	20.0
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	4.100	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 3, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	19.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.900	Cap Infiltration Depth (m)	0.000

Complex Manhole: 4, DS/PN: 1.003

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.2
Membrane Percolation (mm/hr)	1000	Length (m)	12.2
Max Percolation (l/s)	41.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.470	Cap Volume Depth (m)	0.250

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Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	8.0
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.705	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 5, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	18.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.625	Cap Infiltration Depth (m)	0.000

Porous Car Park Manhole: 6, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.0
Max Percolation (l/s)	62.5	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.470	Cap Volume Depth (m)	0.250

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Micro Drainage				Network 2016.1				
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>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 * 10m³/ha Storage 2.000								
Hot Start Level (mm) 0 Inlet Coeffiecient 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 6								
Number of Online Controls 1 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 0.400								
Region England and Wales Cv (Summer) 0.750								
M5-60 (mm) 20.000 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, 200, 1000								
Climate Change (%) 0, 0, 40, 0, 0								

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>							

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Micro Drainage					Network 2016.1				
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>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 * 10m³/ha Storage 2.000									
Hot Start Level (mm) 0 Inlet Coeffiecient 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 6									
Number of Online Controls 1 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 0.400									
Region England and Wales Cv (Summer) 0.750									
M5-60 (mm) 20.000 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, 200, 1000									
Climate Change (%) 0, 0, 40, 0, 0									
									Water
US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level		
PN Name Storm Period Change Surcharge Flood Overflow Act. (m)									
1.000	1	120 Winter	30	+0%	100/15 Summer				4.299
1.001	2	60 Winter	30	+0%	30/30 Summer				4.316
1.002	3	60 Winter	30	+0%	30/15 Summer				4.332
1.003	4	60 Winter	30	+0%	1/60 Winter				4.349
1.004	5	60 Winter	30	+0%	1/30 Summer				4.351
1.005	6	60 Winter	30	+0%	1/15 Summer				4.353
<u>Surcharged Flooded</u>									
US/MH	Depth	Volume	Flow /	Overflow	Pipe				
PN Name (m) (m³) Cap. (l/s) (l/s) Status Level Exceeded									
1.000	1	-0.016	0.000	0.12	1.8	OK			
1.001	2	0.066	0.000	0.30	5.0	FLOOD RISK			
1.002	3	0.282	0.000	0.22	3.6	SURCHARGED			
1.003	4	0.494	0.000	0.19	3.0	SURCHARGED			
1.004	5	0.576	0.000	0.15	2.5	SURCHARGED			
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Date 02/07/2018 09:43 File 01 MD Model 02.07.18.mdx	Designed by A Johnson Checked by D Brooke																						
Micro Drainage Network 2016.1																							
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>																							
<table border="1"> <thead> <tr> <th rowspan="2">PN</th> <th rowspan="2">US/MH Name</th> <th colspan="2">Surcharged Flooded</th> <th rowspan="2">Flow / Cap.</th> <th rowspan="2">Overflow (l/s)</th> <th>Pipe</th> <th rowspan="2">Status</th> <th rowspan="2">Level Exceeded</th> </tr> <tr> <th>Depth (m)</th> <th>Volume (m³)</th> <th>Flow (l/s)</th> </tr> </thead> <tbody> <tr> <td>1.005</td> <td>6</td> <td>0.763</td> <td>0.000</td> <td>0.12</td> <td></td> <td>1.6</td> <td>SURCHARGED</td> <td></td> </tr> </tbody> </table>			PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded	Depth (m)	Volume (m³)	Flow (l/s)	1.005	6	0.763	0.000	0.12		1.6	SURCHARGED	
PN	US/MH Name	Surcharged Flooded			Flow / Cap.	Overflow (l/s)			Pipe			Status	Level Exceeded										
		Depth (m)	Volume (m³)	Flow (l/s)																			
1.005	6	0.763	0.000	0.12		1.6	SURCHARGED																
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Micro Drainage				Network 2016.1				
<u>100 year Return Period 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 * 10m³/ha Storage		2.000		
Hot Start Level (mm)		0		Inlet Coeffiecient		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		6		
Number of Online Controls		1		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		0.400		
Region England and Wales Cv (Summer)		0.750						
M5-60 (mm)		20.000		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, 200, 1000						
Climate Change (%)		0, 0, 40, 0, 0						

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Micro Drainage	Network 2016.1	

200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/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 6
Number of Online Controls 1 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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, 200, 1000
Climate Change (%) 0, 0, 40, 0, 0

US/MH		Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level
PN	Name								(m)
1.000	1	120 Winter	200	+0%	100/15 Summer				4.443
1.001	2	120 Winter	200	+0%	30/30 Summer				4.442
1.002	3	120 Winter	200	+0%	30/15 Summer				4.447
1.003	4	60 Winter	200	+0%	1/60 Winter				4.474
1.004	5	60 Winter	200	+0%	1/30 Summer				4.489
1.005	6	60 Winter	200	+0%	1/15 Summer				4.503

US/MH		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe		Level Exceeded
PN	Name					Flow (l/s)	Status	
1.000	1	0.128	0.000	0.16		2.3	FLOOD RISK	
1.001	2	0.192	0.000	0.22		3.6	FLOOD RISK	
1.002	3	0.397	0.000	0.15		2.4	FLOOD RISK	
1.003	4	0.619	0.000	0.18		2.8	SURCHARGED	
1.004	5	0.714	0.000	0.15		2.4	SURCHARGED	

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Micro Drainage				Network 2016.1																											
<u>200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>																															
<table><tr><td colspan="2"></td><td colspan="2">Surcharged</td><td colspan="2">Flooded</td><td colspan="2">Pipe</td></tr><tr><td>PN</td><td>US/MH Name</td><td>Depth (m)</td><td>Volume (m³)</td><td>Flow / Cap.</td><td>Overflow (l/s)</td><td>Flow (l/s)</td><td>Level Exceeded</td></tr><tr><td>1.005</td><td>6</td><td>0.913</td><td>0.000</td><td>0.12</td><td></td><td>1.7</td><td>SURCHARGED</td></tr></table>										Surcharged		Flooded		Pipe		PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Level Exceeded	1.005	6	0.913	0.000	0.12		1.7	SURCHARGED
		Surcharged		Flooded		Pipe																									
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Level Exceeded																								
1.005	6	0.913	0.000	0.12		1.7	SURCHARGED																								
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<u>1000 year Return Period 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 * 10m³/ha Storage		2.000		
Hot Start Level (mm)		0		Inlet Coeffiecient		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		6		
Number of Online Controls		1		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		0.400		
Region England and Wales Cv (Summer)		0.750						
M5-60 (mm)		20.000		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, 200, 1000						
Climate Change (%)		0, 0, 40, 0, 0						
<u>Water Level</u>								
US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.
								Level
								(m)
1.000	1	180 Winter	1000	+0%	100/15 Summer			4.591
1.001	2	180 Winter	1000	+0%	30/30 Summer			4.590
1.002	3	180 Winter	1000	+0%	30/15 Summer			4.587
1.003	4	180 Winter	1000	+0%	1/60 Winter			4.583
1.004	5	180 Winter	1000	+0%	1/30 Summer			4.580
1.005	6	180 Winter	1000	+0%	1/15 Summer			4.574
<u>Surcharged Flooded</u>								
US/MH	Depth	Volume	Flow /	Overflow	Pipe			
PN	Name	(m)	Cap.	(l/s)	Flow	Status	Level	
							Exceeded	
1.000	1	0.276	0.000	0.12	1.8	FLOOD RISK		
1.001	2	0.340	0.000	0.17	2.8	FLOOD RISK		
1.002	3	0.537	0.000	0.11	1.8	FLOOD RISK		
1.003	4	0.728	0.000	0.12	1.8	FLOOD RISK		
1.004	5	0.805	0.000	0.10	1.7	FLOOD RISK		
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.400	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	0.450
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

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
1.000	6.500	0.065	100.0	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	20.000	0.200	100.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	19.500	0.195	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	8.000	0.080	100.0	0.022	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	18.500	0.185	100.0	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	5.000	0.050	100.0	0.031	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.11	4.165	0.018	0.0	0.0	0.0	1.00	17.8	2.4
1.001	50.00	5.44	4.100	0.031	0.0	0.0	0.0	1.00	17.8	4.2
1.002	50.00	5.76	3.900	0.031	0.0	0.0	0.0	1.00	17.8	4.2
1.003	50.00	5.90	3.705	0.053	0.0	0.0	0.0	1.00	17.8	7.2
1.004	50.00	6.20	3.625	0.060	0.0	0.0	0.0	1.00	17.8	8.1
1.005	50.00	6.29	3.440	0.091	0.0	0.0	0.0	1.00	17.8	12.3

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/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 Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	6

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Micro Drainage Network 2016.1		

Simulation Criteria for Storm

Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type Summer
Return Period (years)	2	Cv (Summer) 0.750
Region England and Wales		Cv (Winter) 0.840
M5-60 (mm)	20.000	Storm Duration (mins) 30
Ratio R	0.400	

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Online Controls for Storm

Hydro-Brake Optimum® Manhole: 6, DS/PN: 1.005, Volume (m³): 1.9

Unit Reference	MD-SHE-0061-2000-1450-2000
Design Head (m)	1.450
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	61
Invert Level (m)	3.440
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.450	2.0
Flush-Flo™	0.270	1.6
Kick-Flo®	0.549	1.3
Mean Flow over Head Range	-	1.6

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)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.8	3.000	2.8	7.000	4.1
0.200	1.6	1.400	2.0	3.500	3.0	7.500	4.3
0.300	1.6	1.600	2.1	4.000	3.2	8.000	4.4
0.400	1.5	1.800	2.2	4.500	3.4	8.500	4.5
0.500	1.4	2.000	2.3	5.000	3.5	9.000	4.7
0.600	1.3	2.200	2.4	5.500	3.7	9.500	4.8
0.800	1.5	2.400	2.5	6.000	3.9		
1.000	1.7	2.600	2.6	6.500	4.0		

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Storage Structures for Storm

Complex Manhole: 1, DS/PN: 1.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	14.2
Membrane Percolation (mm/hr)	1000	Length (m)	14.2
Max Percolation (l/s)	56.0	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.220	Cap Volume Depth (m)	0.250

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	6.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	4.165	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	20.0
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	4.100	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 3, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	19.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.900	Cap Infiltration Depth (m)	0.000

Complex Manhole: 4, DS/PN: 1.003

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.2
Membrane Percolation (mm/hr)	1000	Length (m)	12.2
Max Percolation (l/s)	41.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.470	Cap Volume Depth (m)	0.250

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Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	8.0
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.705	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: 5, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	18.5
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	3.625	Cap Infiltration Depth (m)	0.000

Porous Car Park Manhole: 6, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.0
Max Percolation (l/s)	62.5	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.470	Cap Volume Depth (m)	0.250

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/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 6
 Number of Online Controls 1 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 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 20.000 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, 200, 1000
 Climate Change (%) 0, 0, 40, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	30 Winter	1	+0%	30/120 Winter	1000/120 Winter		
1.001	2	30 Winter	1	+0%	30/15 Winter	1000/120 Winter		
1.002	3	120 Winter	1	+0%	30/15 Summer			
1.003	4	120 Winter	1	+0%	1/30 Winter			
1.004	5	120 Winter	1	+0%	1/15 Winter			
1.005	6	120 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)					
1.000	1	4.196	-0.119	0.000	0.09		1.3	OK	3		
1.001	2	4.137	-0.113	0.000	0.14		2.3	OK	3		
1.002	3	3.943	-0.107	0.000	0.09		1.4	OK			
1.003	4	3.941	0.086	0.000	0.11		1.8	SURCHARGED			
1.004	5	3.938	0.163	0.000	0.10		1.6	SURCHARGED			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

		Water	Surcharged	Flooded		Pipe			
PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded
1.005	6	3.934	0.344	0.000	0.11		1.6	SURCHARGED	

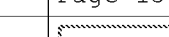
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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>							
<u>Simulation Criteria</u>							
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow		0.000	
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage		2.000	
Hot Start Level (mm)		0		Inlet Coeffiecient		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		6	
Number of Online Controls		1		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		0.400	
Region England and Wales Cv (Summer)		0.750					
M5-60 (mm)		20.000		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, 200, 1000					
Climate Change (%)		0, 0, 40, 0, 0					

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>										
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
1.005	6	4.400	0.810	0.000	0.12		1.7	SURCHARGED		
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Satelliet House 2 Nexus Park Ash Vale GU12 5QE			Kings Beach Hotel Pagham Urban Creep Analysis																																																																																										
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Micro Drainage			Network 2016.1																																																																																										
100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm																																																																																													
Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/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 6 Number of Online Controls 1 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 0.400 Region England and Wales Cv (Summer) 0.750 M5-60 (mm) 20.000 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, 200, 1000 Climate Change (%) 0, 0, 40, 0, 0																																																																																													
<table><tr><td>US/MH</td><td>Return</td><td>Climate</td><td>First (X)</td><td>First (Y)</td><td>First (Z)</td><td>Overflow</td></tr><tr><td>PN</td><td>Name</td><td>Storm</td><td>Period</td><td>Change</td><td>Surcharge</td><td>Flood</td><td>Overflow</td><td>Act.</td></tr><tr><td>1.000</td><td>1</td><td>180 Winter</td><td>100</td><td>+40%</td><td>30/120 Winter</td><td>1000/120 Winter</td><td></td><td></td></tr><tr><td>1.001</td><td>2</td><td>180 Winter</td><td>100</td><td>+40%</td><td>30/15 Winter</td><td>1000/120 Winter</td><td></td><td></td></tr><tr><td>1.002</td><td>3</td><td>180 Winter</td><td>100</td><td>+40%</td><td>30/15 Summer</td><td></td><td></td><td></td></tr><tr><td>1.003</td><td>4</td><td>180 Winter</td><td>100</td><td>+40%</td><td>1/30 Winter</td><td></td><td></td><td></td></tr><tr><td>1.004</td><td>5</td><td>180 Winter</td><td>100</td><td>+40%</td><td>1/15 Winter</td><td></td><td></td><td></td></tr><tr><td>1.005</td><td>6</td><td>60 Winter</td><td>100</td><td>+40%</td><td>1/15 Summer</td><td></td><td></td><td></td></tr></table>						US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	1.000	1	180 Winter	100	+40%	30/120 Winter	1000/120 Winter			1.001	2	180 Winter	100	+40%	30/15 Winter	1000/120 Winter			1.002	3	180 Winter	100	+40%	30/15 Summer				1.003	4	180 Winter	100	+40%	1/30 Winter				1.004	5	180 Winter	100	+40%	1/15 Winter				1.005	6	60 Winter	100	+40%	1/15 Summer																					
US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow																																																																																							
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.																																																																																					
1.000	1	180 Winter	100	+40%	30/120 Winter	1000/120 Winter																																																																																							
1.001	2	180 Winter	100	+40%	30/15 Winter	1000/120 Winter																																																																																							
1.002	3	180 Winter	100	+40%	30/15 Summer																																																																																								
1.003	4	180 Winter	100	+40%	1/30 Winter																																																																																								
1.004	5	180 Winter	100	+40%	1/15 Winter																																																																																								
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<table><tr><td colspan="3">Water</td><td colspan="3">Surcharged</td><td colspan="3">Flooded</td><td colspan="2">Pipe</td></tr><tr><td>US/MH</td><td>Level</td><td>Depth</td><td>Volume</td><td>Flow /</td><td>Overflow</td><td>Pipe</td><td colspan="3"></td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>(m)</td><td>(m)</td><td>(m³)</td><td>Cap.</td><td>(l/s)</td><td>(l/s)</td><td>Status</td><td>Exceeded</td><td></td></tr><tr><td>1.000</td><td>1</td><td>4.554</td><td>0.239</td><td>0.000</td><td>0.12</td><td>1.7</td><td>FLOOD RISK</td><td></td><td>3</td><td></td></tr><tr><td>1.001</td><td>2</td><td>4.553</td><td>0.303</td><td>0.000</td><td>0.16</td><td>2.7</td><td>FLOOD RISK</td><td></td><td>3</td><td></td></tr><tr><td>1.002</td><td>3</td><td>4.550</td><td>0.500</td><td>0.000</td><td>0.11</td><td>1.8</td><td>FLOOD RISK</td><td></td><td></td><td></td></tr><tr><td>1.003</td><td>4</td><td>4.546</td><td>0.691</td><td>0.000</td><td>0.12</td><td>1.8</td><td>SURCHARGED</td><td></td><td></td><td></td></tr><tr><td>1.004</td><td>5</td><td>4.543</td><td>0.768</td><td>0.000</td><td>0.11</td><td>1.8</td><td>SURCHARGED</td><td></td><td></td><td></td></tr></table>						Water			Surcharged			Flooded			Pipe		US/MH	Level	Depth	Volume	Flow /	Overflow	Pipe				Level	PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded		1.000	1	4.554	0.239	0.000	0.12	1.7	FLOOD RISK		3		1.001	2	4.553	0.303	0.000	0.16	2.7	FLOOD RISK		3		1.002	3	4.550	0.500	0.000	0.11	1.8	FLOOD RISK				1.003	4	4.546	0.691	0.000	0.12	1.8	SURCHARGED				1.004	5	4.543	0.768	0.000	0.11	1.8	SURCHARGED			
Water			Surcharged			Flooded			Pipe																																																																																				
US/MH	Level	Depth	Volume	Flow /	Overflow	Pipe				Level																																																																																			
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded																																																																																				
1.000	1	4.554	0.239	0.000	0.12	1.7	FLOOD RISK		3																																																																																				
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		Water Surcharged Flooded				Pipe			
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow		Level	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded
1.005	6	4.542	0.952	0.000	0.13		1.8	SURCHARGED	
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<u>200 year Return Period 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 * 10m³/ha Storage		2.000	
Hot Start Level (mm)		0		Inlet Coeffiecient		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		6	
Number of Online Controls		1		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		0.400	
Region England and Wales Cv (Summer)		0.750					
M5-60 (mm)		20.000		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, 200, 1000					
Climate Change (%)		0, 0, 40, 0, 0					

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200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

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<u>1000 year Return Period 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 * 10m³/ha Storage 2.000																																																								
Hot Start Level (mm) 0 Inlet Coeffiecient 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 6																																																								
Number of Online Controls 1 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 0.400																																																								
Region England and Wales Cv (Summer) 0.750																																																								
M5-60 (mm) 20.000 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, 200, 1000																																																								
Climate Change (%) 0, 0, 40, 0, 0																																																								
<table><tr><td>US/MH</td><td>Return Climate</td><td>First (X)</td><td>First (Y)</td><td>First (Z)</td><td>Overflow</td></tr><tr><td>PN Name Storm Period Change</td><td>Surcharge</td><td>Flood</td><td>Overflow</td><td>Act.</td><td></td></tr><tr><td>1.000 1 180 Winter 1000 +0%</td><td>30/120 Winter</td><td>1000/120 Winter</td><td></td><td></td><td></td></tr><tr><td>1.001 2 180 Winter 1000 +0%</td><td>30/15 Winter</td><td>1000/120 Winter</td><td></td><td></td><td></td></tr><tr><td>1.002 3 120 Winter 1000 +0%</td><td>30/15 Summer</td><td></td><td></td><td></td><td></td></tr><tr><td>1.003 4 120 Winter 1000 +0%</td><td>1/30 Winter</td><td></td><td></td><td></td><td></td></tr><tr><td>1.004 5 120 Winter 1000 +0%</td><td>1/15 Winter</td><td></td><td></td><td></td><td></td></tr><tr><td>1.005 6 120 Winter 1000 +0%</td><td>1/15 Summer</td><td></td><td></td><td></td><td></td></tr></table>									US/MH	Return Climate	First (X)	First (Y)	First (Z)	Overflow	PN Name Storm Period Change	Surcharge	Flood	Overflow	Act.		1.000 1 180 Winter 1000 +0%	30/120 Winter	1000/120 Winter				1.001 2 180 Winter 1000 +0%	30/15 Winter	1000/120 Winter				1.002 3 120 Winter 1000 +0%	30/15 Summer					1.003 4 120 Winter 1000 +0%	1/30 Winter					1.004 5 120 Winter 1000 +0%	1/15 Winter					1.005 6 120 Winter 1000 +0%	1/15 Summer				
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The Stilwell Partnership							Page 15																																
Satelliet House 2 Nexus Park Ash Vale GU12 5QE				Kings Beach Hotel Pagham Urban Creep Analysis																																			
Date 02/07/2018 10:22				Designed by A Johnson																																			
File 02 MD UC Model 02.07.18...				Checked by D Brooke																																			
Micro Drainage				Network 2016.1																																			
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		Water	Surcharged	Flooded		Pipe																																	
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Appendix K

Environment Agency Flood Map

Flood map for planning

Your reference
A18237

Location (easting/northing)
489050/97502

Created
20 Jun 2018 12:32

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference

A18237

Location (easting/northing)

489050/97502

Scale

1:2500

Created

20 Jun 2018 12:32

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

Page 2 of 2



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Chester

Glasgow

Guildford

Huddersfield

London

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Sydney