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Drainage Calculations

Client:	Wolfdale Leisure Ltd
Architect:	HSSP Architects
Project:	Ratby Sports Club
Project No:	25-22211
Document No:	0-010
Issue:	Rev P1: March 2026
Status:	Preliminary
Date:	11th March 2026
Engineer:	LM

Issue Status:
A=Approval
B=Building Regulations
C=Construction
D=Draft
P=Preliminary
R=Review
T=Tender
Z=Final Construction

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

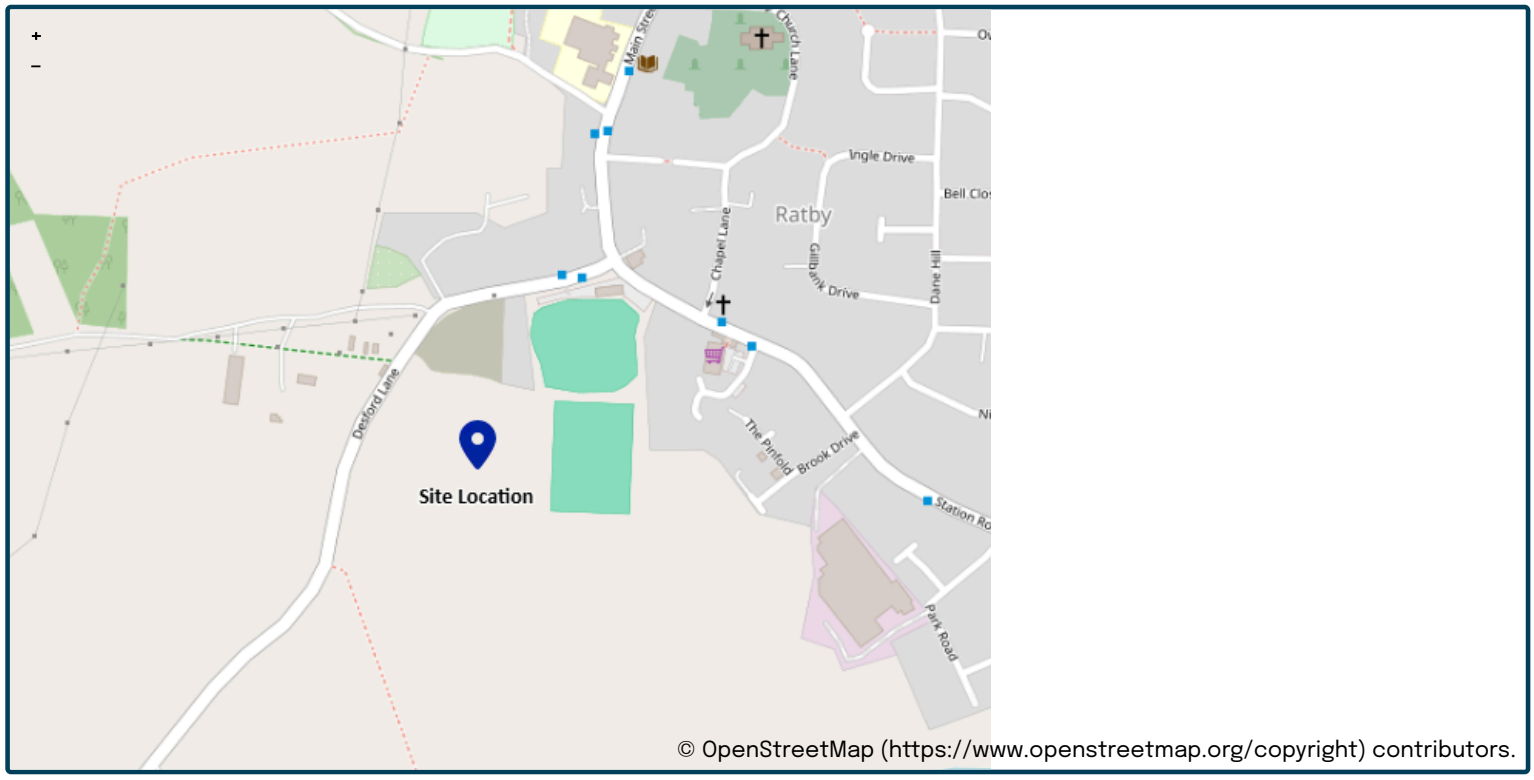
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	09/03/2026
Calculated by	LM
Reference	25-22211
Model version	2.2.3

Location

Site name	Ratby Sports Club
Site location	Desford Lane, Ratby



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Site easting (British National Grid)	451027
Site northing (British National Grid)	305505

Site details

Total site area (ha)	1.98	ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value	
SAAR (mm)	655	mm		655
How should SPR be derived?	WRAP soil type			
WRAP soil type	4			4
SPR	0.47			
QBar (IH124) (l/s)	8.8	l/s		

Growth curve factors

	My value	Map value
Hydrological region	4	4
1 year growth factor	0.83	
2 year growth factor	0.89	
10 year growth factor	1.49	
30 year growth factor	2	
100 year growth factor	2.57	
200 year growth factor	3.04	

Results

Method	IH124	
Flow rate 1 year (l/s)	7.3	l/s
Flow rate 2 year (l/s)	7.9	l/s
Flow rate 10 years (l/s)	13.2	l/s
Flow rate 30 years (l/s)	17.7	l/s
Flow rate 100 years (l/s)	22.7	l/s
Flow rate 200 years (l/s)	26.9	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://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 uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

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	35.800	0.240	149.2	0.157	4.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	37.000	0.250	148.0	0.192	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	43.300	0.340	127.4	0.080	4.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	45.000	0.375	120.0	0.367	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	45.000	0.300	150.0	0.400	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	19.800	0.140	141.4	0.187	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	35.800	0.750	47.7	0.016	4.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	36.900	0.255	144.7	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	10.900	0.080	136.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.46	86.750	0.157	0.0	0.0	0.0	1.29	90.8	21.3
1.001	50.00	4.94	86.510	0.349	0.0	0.0	0.0	1.29	91.2	47.3
2.000	50.00	4.52	86.600	0.080	0.0	0.0	0.0	1.39	98.4	10.8
1.002	50.00	5.40	86.185	0.796	0.0	0.0	0.0	1.65	182.6	107.8
1.003	50.00	5.90	85.810	1.196	0.0	0.0	0.0	1.48	163.1	162.0
1.004	50.00	6.10	85.435	1.383	0.0	0.0	0.0	1.71	271.6	187.3
3.000	50.00	4.41	86.600	0.016	0.0	0.0	0.0	1.46	25.8	2.2
3.001	50.00	5.15	85.850	0.032	0.0	0.0	0.0	0.83	14.7	4.3
1.005	50.00	6.20	85.295	1.415	0.0	0.0	0.0	1.74	276.7	191.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.006	14.600	4.115	3.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	37.600	1.640	22.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	39.400	0.270	145.9	0.006	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	11.900	0.080	148.8	0.039	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	11.800	0.080	147.5	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	27.600	0.255	108.2	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	13.400	0.090	148.9	0.057	4.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	12.400	0.090	137.8	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	30.900	0.200	154.5	0.065	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	10.000	0.070	142.9	0.031	4.00	0.0	0.600	o	225	Pipe/Conduit	
7.001	14.600	0.100	146.0	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	32.400	0.220	147.3	0.133	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.004	17.800	0.245	72.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	11.700	0.085	137.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.006	50.00	6.22	85.215	1.415	0.0	0.0	0.0	10.85	1725.6	191.6
1.007	50.00	6.37	81.100	1.415	0.0	0.0	0.0	4.26	677.6	191.6
4.000	50.00	4.61	80.875	0.006	0.0	0.0	0.0	1.08	42.9	0.8
5.000	50.00	4.19	80.765	0.039	0.0	0.0	0.0	1.07	42.5	5.3
5.001	50.00	4.37	80.685	0.050	0.0	0.0	0.0	1.07	42.7	6.8
4.001	50.00	4.97	80.605	0.107	0.0	0.0	0.0	1.26	49.9	14.5
6.000	50.00	4.21	80.530	0.057	0.0	0.0	0.0	1.07	42.5	7.7
6.001	50.00	4.39	80.440	0.091	0.0	0.0	0.0	1.11	44.2	12.3
4.002	50.00	5.46	80.350	0.263	0.0	0.0	0.0	1.05	41.7	35.6
7.000	50.00	4.15	80.320	0.031	0.0	0.0	0.0	1.09	43.4	4.2
7.001	50.00	4.38	80.250	0.054	0.0	0.0	0.0	1.08	42.9	7.3
4.003	50.00	5.88	80.075	0.450	0.0	0.0	0.0	1.29	91.4	60.9
4.004	50.00	6.04	79.855	0.450	0.0	0.0	0.0	1.85	130.5	60.9
1.008	50.00	6.48	79.460	1.865	0.0	0.0	0.0	1.73	275.3	252.5

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	87.300	0.550	Junction		1.000	86.750	300				
S2	87.300	0.790	Open Manhole	1500	1.001	86.510	300	1.000	86.510	300	
S3	87.300	0.700	Junction		2.000	86.600	300				
S4	87.300	1.115	Open Manhole	1500	1.002	86.185	375	1.001	86.260	300	
								2.000	86.260	300	
S5	87.300	1.490	Open Manhole	1500	1.003	85.810	375	1.002	85.810	375	
S6	87.300	1.865	Open Manhole	1500	1.004	85.435	450	1.003	85.510	375	
S7	87.300	0.700	Junction		3.000	86.600	150				
S8	87.300	1.450	Open Manhole	1200	3.001	85.850	150	3.000	85.850	150	
S9	87.300	2.005	Open Manhole	1500	1.005	85.295	450	1.004	85.295	450	
								3.001	85.595	150	
S10	87.300	2.085	Open Manhole	1500	1.006	85.215	450	1.005	85.215	450	
S11	82.300	1.200	Open Manhole	1500	1.007	81.100	450	1.006	81.100	450	
S12	81.850	0.975	Open Manhole	1200	4.000	80.875	225				
S13	81.900	1.135	Open Manhole	1200	5.000	80.765	225				
S14	81.550	0.865	Open Manhole	1200	5.001	80.685	225	5.000	80.685	225	
S15	81.400	0.795	Open Manhole	1200	4.001	80.605	225	4.000	80.605	225	
								5.001	80.605	225	
S16	81.600	1.070	Open Manhole	1200	6.000	80.530	225				
S17	81.250	0.810	Open Manhole	1200	6.001	80.440	225	6.000	80.440	225	
S18	81.150	0.800	Open Manhole	1200	4.002	80.350	225	4.001	80.350	225	
								6.001	80.350	225	
S19	81.200	0.880	Open Manhole	1200	7.000	80.320	225				
S20	81.000	0.750	Open Manhole	1200	7.001	80.250	225	7.000	80.250	225	
S21	80.800	0.725	Open Manhole	1200	4.003	80.075	300	4.002	80.150	225	
								7.001	80.150	225	
S22	80.650	0.795	Open Manhole	1200	4.004	79.855	300	4.003	79.855	300	
S23	80.500	1.040	Open Manhole	1500	1.008	79.460	450	1.007	79.460	450	
								4.004	79.610	300	
Headwall	80.400	1.025	Open Manhole	0		OUTFALL		1.008	79.375	450	

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	300	S1	87.300	86.750	0.250	Junction	
1.001	o	300	S2	87.300	86.510	0.490	Open Manhole	1500
2.000	o	300	S3	87.300	86.600	0.400	Junction	
1.002	o	375	S4	87.300	86.185	0.740	Open Manhole	1500
1.003	o	375	S5	87.300	85.810	1.115	Open Manhole	1500
1.004	o	450	S6	87.300	85.435	1.415	Open Manhole	1500
3.000	o	150	S7	87.300	86.600	0.550	Junction	
3.001	o	150	S8	87.300	85.850	1.300	Open Manhole	1200
1.005	o	450	S9	87.300	85.295	1.555	Open Manhole	1500
1.006	o	450	S10	87.300	85.215	1.635	Open Manhole	1500
1.007	o	450	S11	82.300	81.100	0.750	Open Manhole	1500
4.000	o	225	S12	81.850	80.875	0.750	Open Manhole	1200
5.000	o	225	S13	81.900	80.765	0.910	Open Manhole	1200
5.001	o	225	S14	81.550	80.685	0.640	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	35.800	149.2	S2	87.300	86.510	0.490	Open Manhole	1500
1.001	37.000	148.0	S4	87.300	86.260	0.740	Open Manhole	1500
2.000	43.300	127.4	S4	87.300	86.260	0.740	Open Manhole	1500
1.002	45.000	120.0	S5	87.300	85.810	1.115	Open Manhole	1500
1.003	45.000	150.0	S6	87.300	85.510	1.415	Open Manhole	1500
1.004	19.800	141.4	S9	87.300	85.295	1.555	Open Manhole	1500
3.000	35.800	47.7	S8	87.300	85.850	1.300	Open Manhole	1200
3.001	36.900	144.7	S9	87.300	85.595	1.555	Open Manhole	1500
1.005	10.900	136.3	S10	87.300	85.215	1.635	Open Manhole	1500
1.006	14.600	3.5	S11	82.300	81.100	0.750	Open Manhole	1500
1.007	37.600	22.9	S23	80.500	79.460	0.590	Open Manhole	1500
4.000	39.400	145.9	S15	81.400	80.605	0.570	Open Manhole	1200
5.000	11.900	148.8	S14	81.550	80.685	0.640	Open Manhole	1200
5.001	11.800	147.5	S15	81.400	80.605	0.570	Open Manhole	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.001	o	225	S15	81.400	80.605	0.570	Open Manhole	1200
6.000	o	225	S16	81.600	80.530	0.845	Open Manhole	1200
6.001	o	225	S17	81.250	80.440	0.585	Open Manhole	1200
4.002	o	225	S18	81.150	80.350	0.575	Open Manhole	1200
7.000	o	225	S19	81.200	80.320	0.655	Open Manhole	1200
7.001	o	225	S20	81.000	80.250	0.525	Open Manhole	1200
4.003	o	300	S21	80.800	80.075	0.425	Open Manhole	1200
4.004	o	300	S22	80.650	79.855	0.495	Open Manhole	1200
1.008	o	450	S23	80.500	79.460	0.590	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.001	27.600	108.2	S18	81.150	80.350	0.575	Open Manhole	1200
6.000	13.400	148.9	S17	81.250	80.440	0.585	Open Manhole	1200
6.001	12.400	137.8	S18	81.150	80.350	0.575	Open Manhole	1200
4.002	30.900	154.5	S21	80.800	80.150	0.425	Open Manhole	1200
7.000	10.000	142.9	S20	81.000	80.250	0.525	Open Manhole	1200
7.001	14.600	146.0	S21	80.800	80.150	0.425	Open Manhole	1200
4.003	32.400	147.3	S22	80.650	79.855	0.495	Open Manhole	1200
4.004	17.800	72.7	S23	80.500	79.610	0.590	Open Manhole	1500
1.008	11.700	137.6	Headwall	80.400	79.375	0.575	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008	Headwall	80.400	79.375	0.000	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	13
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S10, DS/PN: 1.006, Volume (m³): 5.2

Unit Reference	MD-SHE-0056-2000-2085-2000
Design Head (m)	2.085
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	56
Invert Level (m)	85.215
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.085	2.0
Flush-Flo™	0.249	1.3
Kick-Flo®	0.504	1.1
Mean Flow over Head Range	-	1.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	1.200	1.6	3.000	2.4	7.000	3.5
0.200	1.3	1.400	1.7	3.500	2.5	7.500	3.6
0.300	1.3	1.600	1.8	4.000	2.7	8.000	3.7
0.400	1.2	1.800	1.9	4.500	2.9	8.500	3.8
0.500	1.1	2.000	2.0	5.000	3.0	9.000	3.9
0.600	1.1	2.200	2.0	5.500	3.1	9.500	4.0
0.800	1.3	2.400	2.1	6.000	3.3		
1.000	1.4	2.600	2.2	6.500	3.4		

Hydro-Brake® Optimum Manhole: S15, DS/PN: 4.001, Volume (m³): 2.8

Unit Reference	MD-SHE-0109-5000-0795-5000
Design Head (m)	0.795
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	80.605
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: S15, DS/PN: 4.001, Volume (m³): 2.8

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.795	5.0
Flush-Flo™	0.239	5.0
Kick-Flo®	0.534	4.2
Mean Flow over Head Range	-	4.3

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	3.7	1.200	6.1	3.000	9.3	7.000	13.9
0.200	5.0	1.400	6.5	3.500	10.0	7.500	14.4
0.300	5.0	1.600	6.9	4.000	10.7	8.000	14.8
0.400	4.8	1.800	7.3	4.500	11.3	8.500	15.3
0.500	4.4	2.000	7.7	5.000	11.9	9.000	15.7
0.600	4.4	2.200	8.0	5.500	12.4	9.500	16.2
0.800	5.0	2.400	8.4	6.000	12.9		
1.000	5.6	2.600	8.7	6.500	13.5		

Hydro-Brake® Optimum Manhole: S18, DS/PN: 4.002, Volume (m³): 2.4

Unit Reference	MD-SHE-0109-5000-0800-5000
Design Head (m)	0.800
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	80.350
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	5.0
Flush-Flo™	0.241	5.0
Kick-Flo®	0.537	4.2
Mean Flow over Head Range	-	4.3

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	3.7	0.300	5.0	0.500	4.5	0.800	5.0
0.200	5.0	0.400	4.8	0.600	4.4	1.000	5.5

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Hydro-Brake® Optimum Manhole: S18, DS/PN: 4.002, Volume (m³): 2.4

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	6.0	2.400	8.4	5.000	11.8	8.000	14.8
1.400	6.5	2.600	8.7	5.500	12.4	8.500	15.2
1.600	6.9	3.000	9.3	6.000	12.9	9.000	15.7
1.800	7.3	3.500	10.0	6.500	13.4	9.500	16.1
2.000	7.7	4.000	10.6	7.000	13.9		
2.200	8.0	4.500	11.3	7.500	14.4		

Hydro-Brake® Optimum Manhole: S21, DS/PN: 4.003, Volume (m³): 2.5

Unit Reference	MD-SHE-0110-5000-0725-5000
Design Head (m)	0.725
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	110
Invert Level (m)	80.075
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.725	5.0
Flush-Flo™	0.219	5.0
Kick-Flo®	0.495	4.2
Mean Flow over Head Range	-	4.3

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	3.8	1.200	6.3	3.000	9.7	7.000	14.6
0.200	5.0	1.400	6.8	3.500	10.5	7.500	15.0
0.300	4.9	1.600	7.2	4.000	11.1	8.000	15.5
0.400	4.7	1.800	7.6	4.500	11.8	8.500	16.0
0.500	4.2	2.000	8.0	5.000	12.4	9.000	16.4
0.600	4.6	2.200	8.4	5.500	13.0	9.500	16.9
0.800	5.2	2.400	8.7	6.000	13.5		
1.000	5.8	2.600	9.1	6.500	14.1		

Hydro-Brake® Optimum Manhole: S22, DS/PN: 4.004, Volume (m³): 3.1

Unit Reference	MD-SHE-0109-5000-0795-5000
Design Head (m)	0.795
Design Flow (l/s)	5.0
Flush-Flo™	Calculated

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Hydro-Brake® Optimum Manhole: S22, DS/PN: 4.004, Volume (m³): 3.1

Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	79.855
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	0.795	5.0
Flush-Flo™	0.239	5.0
Kick-Flo®	0.534	4.2
Mean Flow over Head Range	-	4.3

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	3.7	1.200	6.1	3.000	9.3	7.000	13.9
0.200	5.0	1.400	6.5	3.500	10.0	7.500	14.4
0.300	5.0	1.600	6.9	4.000	10.7	8.000	14.8
0.400	4.8	1.800	7.3	4.500	11.3	8.500	15.3
0.500	4.4	2.000	7.7	5.000	11.9	9.000	15.7
0.600	4.4	2.200	8.0	5.500	12.4	9.500	16.2
0.800	5.0	2.400	8.4	6.000	12.9		
1.000	5.6	2.600	8.7	6.500	13.5		

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Storage Structures for Storm

Porous Car Park Manhole: S1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	26.0
Membrane Percolation (mm/hr)	1000	Length (m)	42.5
Max Percolation (l/s)	306.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	86.740	Cap Volume Depth (m)	0.500

Porous Car Park Manhole: S2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	35.0
Membrane Percolation (mm/hr)	1000	Length (m)	42.5
Max Percolation (l/s)	413.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	86.740	Cap Volume Depth (m)	0.500

Porous Car Park Manhole: S4, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	39.3
Membrane Percolation (mm/hr)	1000	Length (m)	70.0
Max Percolation (l/s)	764.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	86.740	Cap Volume Depth (m)	0.500

Porous Car Park Manhole: S5, DS/PN: 1.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	45.0
Membrane Percolation (mm/hr)	1000	Length (m)	70.0
Max Percolation (l/s)	875.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	86.740	Cap Volume Depth (m)	0.500

Complex Manhole: S6, DS/PN: 1.004

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	22.0
Membrane Percolation (mm/hr)	1000	Length (m)	70.0
Max Percolation (l/s)	427.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	86.740	Cap Volume Depth (m)	0.500

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Porous Car Park Manhole: S14, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	16.6
Max Percolation (l/s)	31.4	Slope (1:X)	79.8
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.820	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S15, DS/PN: 4.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	14.2
Membrane Percolation (mm/hr)	1000	Length (m)	35.9
Max Percolation (l/s)	141.6	Slope (1:X)	110.1
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.570	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S16, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.3
Membrane Percolation (mm/hr)	1000	Length (m)	18.3
Max Percolation (l/s)	21.9	Slope (1:X)	43.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.670	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S17, DS/PN: 6.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.5
Membrane Percolation (mm/hr)	1000	Length (m)	36.0
Max Percolation (l/s)	95.0	Slope (1:X)	74.9
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.570	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S18, DS/PN: 4.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	19.0
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	179.4	Slope (1:X)	75.5
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.220	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S19, DS/PN: 7.000

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	80.420
Membrane Percolation (mm/hr)	1000	Width (m)	2.5
Max Percolation (l/s)	5.3	Length (m)	7.6
Safety Factor	2.0	Slope (1:X)	51.7
Porosity	0.30	Depression Storage (mm)	5

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Porous Car Park Manhole: S19, DS/PN: 7.000

Evaporation (mm/day) 3 Cap Volume Depth (m) 0.450

Porous Car Park Manhole: S20, DS/PN: 7.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.9
Membrane Percolation (mm/hr)	1000	Length (m)	23.2
Max Percolation (l/s)	63.8	Slope (1:X)	74.9
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.220	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: S21, DS/PN: 4.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	18.7
Membrane Percolation (mm/hr)	1000	Length (m)	38.0
Max Percolation (l/s)	197.4	Slope (1:X)	102.9
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.070	Cap Volume Depth (m)	0.450

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1 year Return Period Summary of Critical Results by Maximum Outflow (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 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 13
Number of Online Controls 5 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) 20.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	1	+0%	100/480 Winter				86.784
1.001	S2	30 Winter	1	+0%	30/60 Summer				86.746
2.000	S3	15 Winter	1	+0%					86.670
1.002	S4	30 Winter	1	+0%	1/15 Winter				86.746
1.003	S5	30 Winter	1	+0%	1/15 Summer				86.746
1.004	S6	30 Winter	1	+0%	1/15 Summer				86.745
3.000	S7	15 Winter	1	+0%					86.631
3.001	S8	15 Winter	1	+0%	1/15 Summer				86.561
1.005	S9	60 Summer	1	+0%	1/15 Summer				86.793
1.006	S10	2160 Winter	1	+0%	1/15 Summer				86.860
1.007	S11	2160 Winter	1	+0%					81.106
4.000	S12	15 Summer	1	+0%					80.898
5.000	S13	15 Summer	1	+0%					80.826
5.001	S14	15 Summer	1	+0%	100/30 Winter				80.746
4.001	S15	60 Winter	1	+0%	100/15 Summer				80.699
6.000	S16	15 Summer	1	+0%	100/15 Summer				80.604
6.001	S17	15 Summer	1	+0%	100/15 Summer				80.514

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.266	0.000	0.01		619	1.1	OK*	
1.001	S2	-0.064	0.000	0.22		135	18.5	OK	
2.000	S3	-0.230	0.000	0.13			12.4	OK*	
1.002	S4	0.186	0.000	0.36		213	60.4	SURCHARGED	
1.003	S5	0.561	0.000	0.58		331	86.3	SURCHARGED	
1.004	S6	0.860	0.000	0.25		555	52.5	SURCHARGED	
3.000	S7	-0.119	0.000	0.10			2.5	OK*	
3.001	S8	0.561	0.000	0.31			4.4	SURCHARGED	
1.005	S9	1.048	0.000	0.11			19.2	SURCHARGED	
1.006	S10	1.195	0.000	0.00			1.8	SURCHARGED	
1.007	S11	-0.444	0.000	0.00			1.8	OK	
4.000	S12	-0.202	0.000	0.02			0.9	OK	
5.000	S13	-0.164	0.000	0.17			6.0	OK	
5.001	S14	-0.164	0.000	0.17		6	6.0	OK	
4.001	S15	-0.131	0.000	0.08		27	3.5	OK	
6.000	S16	-0.151	0.000	0.24		5	8.8	OK	
6.001	S17	-0.151	0.000	0.23		8	8.8	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.002	S18	180 Winter	1	+0%	30/60 Summer				80.474
7.000	S19	15 Summer	1	+0%	100/60 Winter				80.374
7.001	S20	30 Winter	1	+0%	30/240 Winter				80.301
4.003	S21	120 Winter	1	+0%	30/30 Winter				80.278
4.004	S22	720 Summer	1	+0%	30/480 Winter				80.034
1.008	S23	600 Winter	1	+0%					79.517

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.002	S18	-0.101	0.000	0.12		83	4.6	OK	
7.000	S19	-0.171	0.000	0.13		5	4.8	OK	
7.001	S20	-0.174	0.000	0.11		12	4.3	OK	
4.003	S21	-0.097	0.000	0.06		53	5.0	OK	
4.004	S22	-0.121	0.000	0.04			4.9	OK	
1.008	S23	-0.393	0.000	0.04			6.7	OK	

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30 year Return Period Summary of Critical Results by Maximum Outflow (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 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 13
Number of Online Controls 5 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) 20.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	60 Winter	30	+0%	100/480 Winter				86.832
1.001	S2	15 Winter	30	+0%	30/60 Summer				86.784
2.000	S3	15 Winter	30	+0%					86.798
1.002	S4	15 Winter	30	+0%	1/15 Winter				86.783
1.003	S5	15 Winter	30	+0%	1/15 Summer				86.782
1.004	S6	15 Summer	30	+0%	1/15 Summer				86.775
3.000	S7	15 Summer	30	+0%					86.750
3.001	S8	15 Summer	30	+0%	1/15 Summer				86.861
1.005	S9	15 Summer	30	+0%	1/15 Summer				86.950
1.006	S10	2160 Winter	30	+0%	1/15 Summer				86.989
1.007	S11	2160 Winter	30	+0%					81.107
4.000	S12	15 Winter	30	+0%					80.909
5.000	S13	15 Winter	30	+0%					80.865
5.001	S14	15 Summer	30	+0%	100/30 Winter				80.802
4.001	S15	30 Winter	30	+0%	100/15 Summer				80.806
6.000	S16	15 Winter	30	+0%	100/15 Summer				80.654
6.001	S17	15 Winter	30	+0%	100/15 Summer				80.607

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.218	0.000	0.05		1270	4.6	OK*	
1.001	S2	-0.026	0.000	0.60		653	50.9	OK	
2.000	S3	-0.102	0.000	0.28			27.3	OK*	
1.002	S4	0.223	0.000	0.72		743	120.7	SURCHARGED	
1.003	S5	0.597	0.000	0.93		755	139.7	SURCHARGED	
1.004	S6	0.890	0.000	0.45		716	93.9	SURCHARGED	
3.000	S7	0.000	0.000	0.23			6.0	SURCHARGED*	
3.001	S8	0.861	0.000	0.65			9.3	SURCHARGED	
1.005	S9	1.205	0.000	0.22			37.5	SURCHARGED	
1.006	S10	1.324	0.000	0.00			1.8	SURCHARGED	
1.007	S11	-0.443	0.000	0.00			1.8	OK	
4.000	S12	-0.191	0.000	0.05			2.2	OK	
5.000	S13	-0.125	0.000	0.41			14.8	OK	
5.001	S14	-0.108	0.000	0.52		15	19.1	OK	
4.001	S15	-0.024	0.000	0.11		29	5.0	OK	
6.000	S16	-0.101	0.000	0.59		6	21.6	OK	
6.001	S17	-0.058	0.000	0.89		3	33.6	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.002	S18	60 Winter	30	+0%	30/60 Summer				80.618
7.000	S19	15 Winter	30	+0%	100/60 Winter				80.408
7.001	S20	15 Winter	30	+0%	30/240 Winter				80.355
4.003	S21	15 Summer	30	+0%	30/30 Winter				80.322
4.004	S22	30 Winter	30	+0%	30/480 Winter				80.131
1.008	S23	1440 Winter	30	+0%					79.517

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.002	S18	0.043	0.000	0.13		123	5.0	SURCHARGED	
7.000	S19	-0.137	0.000	0.33		7	11.8	OK	
7.001	S20	-0.120	0.000	0.44		103	16.4	OK	
4.003	S21	-0.053	0.000	0.06		112	5.0	OK	
4.004	S22	-0.024	0.000	0.04			4.9	OK	
1.008	S23	-0.393	0.000	0.04			6.7	OK	

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100 year Return Period Summary of Critical Results by Maximum Outflow (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 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 13
Number of Online Controls 5 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) 20.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	30 Winter	100	+40%	100/480 Winter				86.890
1.001	S2	15 Summer	100	+40%	30/60 Summer				86.833
2.000	S3	15 Summer	100	+40%					86.900
1.002	S4	15 Summer	100	+40%	1/15 Winter				86.833
1.003	S5	15 Summer	100	+40%	1/15 Summer				86.830
1.004	S6	15 Winter	100	+40%	1/15 Summer				86.844
3.000	S7	15 Winter	100	+40%					86.750
3.001	S8	15 Winter	100	+40%	1/15 Summer				87.226
1.005	S9	15 Winter	100	+40%	1/15 Summer				87.017
1.006	S10	2880 Winter	100	+40%	1/15 Summer				87.201
1.007	S11	2880 Winter	100	+40%					81.107
4.000	S12	15 Winter	100	+40%					80.923
5.000	S13	15 Winter	100	+40%					80.910
5.001	S14	15 Summer	100	+40%	100/30 Winter				80.865
4.001	S15	15 Summer	100	+40%	100/15 Summer				80.860
6.000	S16	15 Winter	100	+40%	100/15 Summer				80.803
6.001	S17	15 Winter	100	+40%	100/15 Summer				80.722

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.160	0.000	0.13			11.5	OK*	
1.001	S2	0.023	0.000	0.55		1333	46.4	SURCHARGED	
2.000	S3	0.000	0.000	0.53			52.1	SURCHARGED*	
1.002	S4	0.273	0.000	0.67		1401	112.2	SURCHARGED	
1.003	S5	0.645	0.000	0.96			143.6	SURCHARGED	
1.004	S6	0.959	0.000	0.50			104.9	SURCHARGED	
3.000	S7	0.000	0.000	0.35			9.1	SURCHARGED*	
3.001	S8	1.226	0.000	1.15			16.4	FLOOD RISK	
1.005	S9	1.272	0.000	0.23			39.1	FLOOD RISK	
1.006	S10	1.536	0.000	0.00			1.9	FLOOD RISK	
1.007	S11	-0.443	0.000	0.00			1.9	OK	
4.000	S12	-0.177	0.000	0.10			4.1	OK	
5.000	S13	-0.080	0.000	0.74			26.9	OK	
5.001	S14	-0.045	0.000	0.93		23	33.8	OK	
4.001	S15	0.030	0.000	0.11		42	5.0	SURCHARGED	
6.000	S16	0.048	0.000	0.95		4	35.1	SURCHARGED	
6.001	S17	0.057	0.000	1.30		6	49.3	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.002	S18	480 Summer	100	+40%	30/60 Summer				80.802
7.000	S19	15 Summer	100	+40%	100/60 Winter				80.445
7.001	S20	15 Summer	100	+40%	30/240 Winter				80.424
4.003	S21	720 Winter	100	+40%	30/30 Winter				80.739
4.004	S22	4320 Winter	100	+40%	30/480 Winter				80.119
1.008	S23	2160 Winter	100	+40%					79.518

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.002	S18	0.227	0.000	0.13		466	5.0	SURCHARGED	
7.000	S19	-0.100	0.000	0.59		202	21.4	OK	
7.001	S20	-0.051	0.000	0.72		168	27.1	OK	
4.003	S21	0.364	0.000	0.06		662	5.0	FLOOD RISK	
4.004	S22	-0.036	0.000	0.04			4.9	OK	
1.008	S23	-0.392	0.000	0.04			6.8	OK	

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