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	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	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.	1.000	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
S1.000	0.511	0.010	51.1	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	10.545	0.525	20.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	1.149	0.010	114.9	0.084	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	3.990	0.200	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	9.514	0.042	226.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	11.465	0.051	224.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	1.029	0.010	102.9	0.116	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	6.276	0.209	30.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.000	0.825	0.010	82.5	0.039	5.00	0.0	0.600	o	150	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)
S1.000	50.00	5.01	62.563	0.050	0.0	0.0	0.0	1.41	24.9	9.1
S1.001	50.00	5.08	62.178	0.050	0.0	0.0	0.0	2.26	39.9	9.1
S2.000	50.00	5.02	62.130	0.084	0.0	0.0	0.0	1.22	48.5	15.1
S2.001	50.00	5.05	61.830	0.084	0.0	0.0	0.0	2.26	40.0	15.1
S1.002	50.00	5.24	60.340	0.134	0.0	0.0	0.0	1.04	73.5	24.2
S1.003	50.00	5.42	60.298	0.134	0.0	0.0	0.0	1.04	73.8	24.2
S3.000	50.00	5.01	61.400	0.116	0.0	0.0	0.0	1.29	51.2	20.9
S3.001	50.00	5.06	61.100	0.116	0.0	0.0	0.0	2.40	95.3	20.9
S4.000	50.00	5.01	61.878	0.039	0.0	0.0	0.0	1.11	19.6	7.0

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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
S4.001	14.624	0.585	25.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S5.000	0.505	0.010	50.5	0.051	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	4.674	0.234	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	7.755	0.052	149.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	37.854	1.352	28.0	0.012	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	8.570	1.182	7.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	5.499	0.275	20.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	9.192	0.065	141.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	4.986	0.033	151.1	0.000	0.00	0.0	0.600	o	375	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)
S4.001	50.00	5.13	61.494	0.039	0.0	0.0	0.0	2.02	35.7	7.0
S5.000	50.00	5.00	61.469	0.051	0.0	0.0	0.0	1.84	73.4	9.2
S5.001	50.00	5.04	61.169	0.051	0.0	0.0	0.0	2.26	40.0	9.2
S1.004	50.00	5.52	60.247	0.340	0.0	0.0	0.0	1.29	90.8	61.3
S6.000	50.00	5.25	60.340	0.012	0.0	0.0	0.0	2.48	98.7	2.1
S6.001	50.00	5.28	58.952	0.012	0.0	0.0	0.0	4.89	194.4	2.1
S6.002	50.00	5.31	57.760	0.012	0.0	0.0	0.0	2.94	116.9	2.1
S6.003	50.00	5.42	57.335	0.012	0.0	0.0	0.0	1.52	168.1	2.1
S1.005	50.00	5.58	57.270	0.351	0.0	0.0	0.0	1.47	162.5	63.4

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Bac
Schannel 1	62.928	0.365	Open Manhole	32500 x 150	S1.000	62.563	150				
Soutlet 1	62.928	0.750	Open Manhole	150	S1.001	62.178	150	S1.000	62.553	150	
Schannel 2	62.580	0.450	Open Manhole	34320 x 225	S2.000	62.130	225				
Soutlet 2	62.580	0.750	Open Manhole	225	S2.001	61.830	150	S2.000	62.120	225	
S1	62.703	2.363	Open Manhole	1200	S1.002	60.340	300	S1.001	61.653	150	
								S2.001	61.631	150	
Stank	62.391	2.093	Open Manhole	100	S1.003	60.298	300	S1.002	60.298	300	
Schannel 3	61.850	0.450	Open Manhole	59300 x 225	S3.000	61.400	225				
Soutlet 3	61.850	0.750	Open Manhole	225	S3.001	61.100	225	S3.000	61.390	225	
Schannel 4	62.244	0.366	Open Manhole	32500 x 150	S4.000	61.878	150				
Soutlet 4	62.244	0.750	Open Manhole	150	S4.001	61.494	150	S4.000	61.868	150	
Schannel 5	61.919	0.450	Open Manhole	19800 x 225	S5.000	61.469	225				
Soutlet 5	61.919	0.750	Open Manhole	225	S5.001	61.169	150	S5.000	61.459	225	
S2	62.028	1.781	Open Manhole	1500	S1.004	60.247	300	S1.003	60.247	300	
								S3.001	60.891	225	
								S4.001	60.909	150	
								S5.001	60.935	150	
Sjunction	61.906	1.566	Junction		S6.000	60.340	225				
Sex30	62.098	3.146	Open Manhole	1200	S6.001	58.952	225	S6.000	58.988	225	
Sex29	62.063	4.303	Open Manhole	1200	S6.002	57.760	225	S6.001	57.770	225	
Sjunction	61.971	4.636	Junction		S6.003	57.335	375	S6.002	57.485	225	
S3	61.894	4.624	Open Manhole	1350	S1.005	57.270	375	S1.004	60.195	300	
								S6.003	57.270	375	
S	61.410	4.173	Open Manhole	0		OUTFALL		S1.005	57.237	375	

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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)
S1.000	o	150	Schannel 1	62.928	62.563	0.215	Open Manhole	32500 x 150
S1.001	o	150	Soutlet 1	62.928	62.178	0.600	Open Manhole	150
S2.000	o	225	Schannel 2	62.580	62.130	0.225	Open Manhole	34320 x 225
S2.001	o	150	Soutlet 2	62.580	61.830	0.600	Open Manhole	225
S1.002	o	300	S1	62.703	60.340	2.063	Open Manhole	1200
S1.003	o	300	Stank	62.391	60.298	1.793	Open Manhole	100
S3.000	o	225	Schannel 3	61.850	61.400	0.225	Open Manhole	59300 x 225
S3.001	o	225	Soutlet 3	61.850	61.100	0.525	Open Manhole	225
S4.000	o	150	Schannel 4	62.244	61.878	0.216	Open Manhole	32500 x 150
S4.001	o	150	Soutlet 4	62.244	61.494	0.600	Open Manhole	150
S5.000	o	225	Schannel 5	61.919	61.469	0.225	Open Manhole	19800 x 225
S5.001	o	150	Soutlet 5	61.919	61.169	0.600	Open Manhole	225
S1.004	o	300	S2	62.028	60.247	1.481	Open Manhole	1500
S6.000	o	225	Sjunction	61.906	60.340	1.341	Junction	

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)
S1.000	0.511	51.1	Soutlet 1	62.928	62.553	0.225	Open Manhole	150
S1.001	10.545	20.1	S1	62.703	61.653	0.900	Open Manhole	1200
S2.000	1.149	114.9	Soutlet 2	62.580	62.120	0.235	Open Manhole	225
S2.001	3.990	20.0	S1	62.703	61.631	0.923	Open Manhole	1200
S1.002	9.514	226.5	Stank	62.391	60.298	1.793	Open Manhole	100
S1.003	11.465	224.8	S2	62.028	60.247	1.481	Open Manhole	1500
S3.000	1.029	102.9	Soutlet 3	61.850	61.390	0.235	Open Manhole	225
S3.001	6.276	30.0	S2	62.028	60.891	0.912	Open Manhole	1500
S4.000	0.825	82.5	Soutlet 4	62.244	61.868	0.226	Open Manhole	150
S4.001	14.624	25.0	S2	62.028	60.909	0.969	Open Manhole	1500
S5.000	0.505	50.5	Soutlet 5	61.919	61.459	0.235	Open Manhole	225
S5.001	4.674	20.0	S2	62.028	60.935	0.943	Open Manhole	1500
S1.004	7.755	149.1	S3	61.894	60.195	1.399	Open Manhole	1350
S6.000	37.854	28.0	Sex30	62.098	58.988	2.885	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)
S6.001	o	225	Sex30	62.098	58.952	2.921	Open Manhole	1200
S6.002	o	225	Sex29	62.063	57.760	4.078	Open Manhole	1200
S6.003	o	375	Sjunction	61.971	57.335	4.261	Junction	
S1.005	o	375	S3	61.894	57.270	4.249	Open Manhole	1350

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)
S6.001	8.570	7.3	Sex29	62.063	57.770	4.068	Open Manhole	1200
S6.002	5.499	20.0	Sjunction	61.971	57.485	4.261	Junction	
S6.003	9.192	141.4	S3	61.894	57.270	4.249	Open Manhole	1350
S1.005	4.986	151.1	S	61.410	57.237	3.798	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.050	0.050	0.050
1.001	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.084	0.084	0.084
2.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.002	0.002	0.002
	User	-	100	0.114	0.114	0.116
3.001	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.039	0.039	0.039
4.001	-	-	100	0.000	0.000	0.000
5.000	User	-	100	0.051	0.051	0.051
5.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
6.000	User	-	100	0.012	0.012	0.012
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
6.003	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.351	0.351	0.351

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	S	61.410	57.237	0.000	0	0

Datum (m) 57.237 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	1.900	300	1.900	540	1.900	780	1.900	1020	1.900	1260	1.900
120	1.900	360	1.900	600	1.900	840	1.900	1080	1.900	1320	1.900
180	1.900	420	1.900	660	1.900	900	1.900	1140	1.900	1380	1.900
240	1.900	480	1.900	720	1.900	960	1.900	1200	1.900	1440	1.900

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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	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	1
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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S2, DS/PN: S1.004, Volume (m³): 4.4

Unit Reference	MD-SHE-0115-7000-1600-7000
Design Head (m)	1.600
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	115
Invert Level (m)	60.247
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	7.0
Flush-Flo™	0.476	7.0
Kick-Flo®	0.977	5.6
Mean Flow over Head Range	-	6.1

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	4.0	1.200	6.1	3.000	9.4	7.000	14.1
0.200	6.2	1.400	6.6	3.500	10.1	7.500	14.5
0.300	6.7	1.600	7.0	4.000	10.8	8.000	15.0
0.400	6.9	1.800	7.4	4.500	11.4	8.500	15.4
0.500	7.0	2.000	7.8	5.000	12.0	9.000	15.9
0.600	6.9	2.200	8.1	5.500	12.5	9.500	16.3
0.800	6.5	2.400	8.5	6.000	13.1		
1.000	5.6	2.600	8.8	6.500	13.6		

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Storage Structures for Storm

Cellular Storage Manhole: Stank, DS/PN: S1.003

Invert Level (m) 60.298 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	140.0	0.0	1.201	0.0	0.0
1.200	140.0	0.0			

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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 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 1
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 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 18.000 Cv (Winter) 1.000

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
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.
S1.000	Schannel 1	15 Summer	1	+0%	30/15 Summer			
S1.001	Soutlet 1	15 Summer	1	+0%				
S2.000	Schannel 2	15 Summer	1	+0%	100/15 Summer			
S2.001	Soutlet 2	15 Summer	1	+0%	30/15 Summer			
S1.002	S1	120 Summer	1	+0%	30/30 Summer			
S1.003	Stank	120 Summer	1	+0%	30/15 Summer			
S3.000	Schannel 3	15 Summer	1	+0%	30/15 Summer			
S3.001	Soutlet 3	15 Summer	1	+0%	100/15 Summer			
S4.000	Schannel 4	15 Summer	1	+0%	30/15 Summer			
S4.001	Soutlet 4	15 Summer	1	+0%	100/180 Summer			
S5.000	Schannel 5	15 Summer	1	+0%	100/15 Summer			
S5.001	Soutlet 5	15 Summer	1	+0%	100/15 Summer			
S1.004	S2	15 Summer	1	+0%	1/15 Summer			
S6.000	Sjunction	15 Summer	1	+0%				
S6.001	Sex30	120 Summer	1	+0%				
S6.002	Sex29	120 Summer	1	+0%	1/15 Summer			
S6.003	Sjunction	120 Winter	1	+0%				
S1.005	S3	120 Summer	1	+0%	1/15 Summer			

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

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
S1.000	Schannel 1	62.654	-0.059	0.000	0.67		7.3	FLOOD RISK	
S1.001	Soutlet 1	62.224	-0.104	0.000	0.20		7.2	OK	
S2.000	Schannel 2	62.230	-0.125	0.000	0.41		12.2	OK	
S2.001	Soutlet 2	61.899	-0.081	0.000	0.43		12.2	OK	
S1.002	S1	60.462	-0.178	0.000	0.17		9.8	OK	
S1.003	Stank	60.460	-0.138	0.000	0.09		5.1	OK	
S3.000	Schannel 3	61.518	-0.107	0.000	0.53		15.8	OK	
S3.001	Soutlet 3	61.176	-0.149	0.000	0.25		15.9	OK	
S4.000	Schannel 4	61.955	-0.073	0.000	0.52		5.6	FLOOD RISK	
S4.001	Soutlet 4	61.536	-0.108	0.000	0.17		5.6	OK	
S5.000	Schannel 5	61.546	-0.148	0.000	0.26		7.6	OK	
S5.001	Soutlet 5	61.220	-0.099	0.000	0.25		7.7	OK	
S1.004	S2	60.630	0.083	0.000	0.11		6.9	SURCHARGED	
S6.000	Sjunction	60.359	-0.206	0.000	0.02		1.8	OK*	
S6.001	Sex30	59.142	-0.035	0.000	0.01		0.9	OK	
S6.002	Sex29	59.140	1.155	0.000	0.01		0.9	SURCHARGED	
S6.003	Sjunction	57.710	0.000	0.000	0.01		0.6	SURCHARGED*	
S1.005	S3	59.139	1.494	0.000	0.08		7.4	SURCHARGED	

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30 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 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 1
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 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 18.000 Cv (Winter) 1.000

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
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.
S1.000	Schannel 1	15 Summer	30	+0%	30/15 Summer			
S1.001	Soutlet 1	15 Summer	30	+0%				
S2.000	Schannel 2	15 Summer	30	+0%	100/15 Summer			
S2.001	Soutlet 2	15 Summer	30	+0%	30/15 Summer			
S1.002	S1	180 Summer	30	+0%	30/30 Summer			
S1.003	Stank	180 Summer	30	+0%	30/15 Summer			
S3.000	Schannel 3	15 Summer	30	+0%	30/15 Summer			
S3.001	Soutlet 3	15 Summer	30	+0%	100/15 Summer			
S4.000	Schannel 4	15 Summer	30	+0%	30/15 Summer			
S4.001	Soutlet 4	15 Summer	30	+0%	100/180 Summer			
S5.000	Schannel 5	15 Summer	30	+0%	100/15 Summer			
S5.001	Soutlet 5	15 Summer	30	+0%	100/15 Summer			
S1.004	S2	180 Summer	30	+0%	1/15 Summer			
S6.000	Sjunction	15 Summer	30	+0%				
S6.001	Sex30	120 Summer	30	+0%				
S6.002	Sex29	120 Summer	30	+0%	1/15 Summer			
S6.003	Sjunction	120 Winter	30	+0%				
S1.005	S3	120 Summer	30	+0%	1/15 Summer			

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

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
S1.000	Schannel 1	62.778	0.065	0.000	1.60		17.4	FLOOD RISK	
S1.001	Soutlet 1	62.253	-0.075	0.000	0.49		17.5	OK	
S2.000	Schannel 2	62.315	-0.040	0.000	0.99		29.7	FLOOD RISK	
S2.001	Soutlet 2	62.001	0.021	0.000	1.06		29.7	SURCHARGED	
S1.002	S1	60.845	0.205	0.000	0.31		17.8	SURCHARGED	
S1.003	Stank	60.844	0.246	0.000	0.12		6.9	SURCHARGED	
S3.000	Schannel 3	61.671	0.046	0.000	1.19		35.6	FLOOD RISK	
S3.001	Soutlet 3	61.220	-0.105	0.000	0.55		35.3	OK	
S4.000	Schannel 4	62.058	0.030	0.000	1.20		13.1	FLOOD RISK	
S4.001	Soutlet 4	61.560	-0.084	0.000	0.40		13.1	OK	
S5.000	Schannel 5	61.600	-0.094	0.000	0.63		18.8	OK	
S5.001	Soutlet 5	61.255	-0.064	0.000	0.62		18.8	OK	
S1.004	S2	60.842	0.295	0.000	0.11		7.0	SURCHARGED	
S6.000	Sjunction	60.370	-0.195	0.000	0.04		4.4	OK*	
S6.001	Sex30	59.146	-0.031	0.000	0.01		2.1	OK	
S6.002	Sex29	59.143	1.158	0.000	0.03		2.1	SURCHARGED	
S6.003	Sjunction	57.710	0.000	0.000	0.01		1.4	SURCHARGED*	
S1.005	S3	59.139	1.494	0.000	0.09		9.0	SURCHARGED	

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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 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 1
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 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 18.000 Cv (Winter) 1.000

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
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.
S1.000	Schannel 1	15 Summer	100	+40%	30/15 Summer			
S1.001	Soutlet 1	15 Summer	100	+40%				
S2.000	Schannel 2	15 Summer	100	+40%	100/15 Summer			
S2.001	Soutlet 2	15 Summer	100	+40%	30/15 Summer			
S1.002	S1	180 Winter	100	+40%	30/30 Summer			
S1.003	Stank	180 Winter	100	+40%	30/15 Summer			
S3.000	Schannel 3	15 Summer	100	+40%	30/15 Summer			
S3.001	Soutlet 3	180 Winter	100	+40%	100/15 Summer			
S4.000	Schannel 4	15 Summer	100	+40%	30/15 Summer			
S4.001	Soutlet 4	180 Winter	100	+40%	100/180 Summer			
S5.000	Schannel 5	180 Winter	100	+40%	100/15 Summer			
S5.001	Soutlet 5	180 Winter	100	+40%	100/15 Summer			
S1.004	S2	180 Winter	100	+40%	1/15 Summer			
S6.000	Sjunction	15 Summer	100	+40%				
S6.001	Sex30	120 Summer	100	+40%				
S6.002	Sex29	120 Summer	100	+40%	1/15 Summer			
S6.003	Sjunction	120 Winter	100	+40%				
S1.005	S3	120 Summer	100	+40%	1/15 Summer			

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

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
S1.000	Schannel 1	62.923	0.210	0.000	2.75		29.9	FLOOD RISK	
S1.001	Soutlet 1	62.283	-0.045	0.000	0.84		29.9	OK	
S2.000	Schannel 2	62.521	0.166	0.000	1.65		49.2	FLOOD RISK	
S2.001	Soutlet 2	62.397	0.417	0.000	1.76		49.3	FLOOD RISK	
S1.002	S1	61.853	1.213	0.000	0.38		21.6	SURCHARGED	
S1.003	Stank	61.852	1.254	0.000	0.11		6.4	SURCHARGED	
S3.000	Schannel 3	61.847	0.222	0.000	2.29		68.5	FLOOD RISK	
S3.001	Soutlet 3	61.850	0.525	0.000	0.29		19.0	FLOOD RISK	
S4.000	Schannel 4	62.169	0.141	0.000	2.25		24.4	FLOOD RISK	
S4.001	Soutlet 4	61.878	0.234	0.000	0.19		6.4	SURCHARGED	
S5.000	Schannel 5	61.814	0.120	0.000	0.28		8.4	FLOOD RISK	
S5.001	Soutlet 5	61.827	0.508	0.000	0.28		8.4	FLOOD RISK	
S1.004	S2	61.873	1.326	0.000	0.11		7.0	FLOOD RISK	
S6.000	Sjunction	60.382	-0.183	0.000	0.08		7.9	OK*	
S6.001	Sex30	59.150	-0.027	0.000	0.02		3.8	OK	
S6.002	Sex29	59.145	1.160	0.000	0.05		3.8	SURCHARGED	
S6.003	Sjunction	57.710	0.000	0.000	0.02		2.6	SURCHARGED*	
S1.005	S3	59.140	1.495	0.000	0.11		10.6	SURCHARGED	

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