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)	18.150	Add Flow / Climate Change (%)	0
Ratio R	0.385	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)	400

Designed with Level Inverts

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.132	4-8	0.040

Total Area Contributing (ha) = 0.172

Total Pipe Volume (m³) = 4.970

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	5.885	0.080	73.6	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	🔒
S1.001	11.823	0.150	78.8	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	🔒
S1.002	10.757	0.140	76.8	0.006	0.00	0.0	0.600	o	100	Pipe/Conduit	🔒
S2.000	10.207	0.130	78.5	0.006	5.00	0.0	0.600	o	100	Pipe/Conduit	🔒
S2.001	13.719	0.240	57.2	0.006	0.00	0.0	0.600	o	100	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	5.11	73.300	0.003	0.0	0.0	0.0	0.90	7.1	0.4
S1.001	50.00	5.34	73.220	0.008	0.0	0.0	0.0	0.87	6.8	1.1
S1.002	50.00	5.54	73.070	0.014	0.0	0.0	0.0	0.88	6.9	1.9
S2.000	50.00	5.20	73.300	0.006	0.0	0.0	0.0	0.87	6.8	0.8
S2.001	50.00	5.42	73.170	0.012	0.0	0.0	0.0	1.02	8.0	1.6

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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
S3.000	5.835	0.460	12.7	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.003	4.468	0.470	9.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.000	11.106	0.620	17.9	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
S4.001	13.292	0.080	166.2	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.002	14.673	0.090	163.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	9.925	0.060	165.4	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	10.151	0.610	16.6	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
S5.001	22.157	0.140	158.3	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.002	11.620	0.100	116.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	7.872	0.750	10.5	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	20.531	0.170	120.8	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	7.053	0.620	11.4	0.045	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	2.000	0.030	66.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	1.784	0.020	89.2	0.000	0.00	0.0	0.600	o	225	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)
S3.000	50.00	5.04	73.390	0.005	0.0	0.0	0.0	2.18	17.1	0.7
S1.003	50.00	5.56	72.930	0.031	0.0	0.0	0.0	3.29	58.1	4.2
S4.000	50.00	5.10	73.250	0.005	0.0	0.0	0.0	1.83	14.4	0.7
S4.001	50.00	5.32	72.630	0.018	0.0	0.0	0.0	1.01	40.2	2.4
S4.002	50.00	5.56	72.550	0.018	0.0	0.0	0.0	1.02	40.6	2.4
S1.004	50.00	5.73	72.460	0.078	0.0	0.0	0.0	1.01	40.3	10.6
S5.000	50.00	5.09	73.250	0.004	0.0	0.0	0.0	1.90	14.9	0.5
S5.001	50.00	5.45	72.640	0.033	0.0	0.0	0.0	1.04	41.2	4.5
S5.002	50.00	5.60	72.500	0.033	0.0	0.0	0.0	1.21	48.2	4.5
S6.000	50.00	5.04	73.150	0.008	0.0	0.0	0.0	3.13	55.3	1.1
S1.005	50.00	6.01	72.400	0.127	0.0	0.0	0.0	1.19	47.3	17.2
S7.000	50.00	5.04	72.850	0.045	0.0	0.0	0.0	3.00	53.1	6.1
S1.006	50.00	6.03	72.230	0.172	0.0	0.0	0.0	1.60	63.8	23.3
S1.007	50.00	6.06	71.850	0.172	0.0	0.0	0.0	1.39	55.1	23.3

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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
S1.008	4.702	0.050	94.0	0.000	0.00	0.0	0.600	o	225	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)
S1.008	50.00	6.11	71.830	0.172	0.0	0.0	0.0	1.35	53.6	23.3

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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	73.900	0.600	Open Manhole	225	S1.000	73.300	100				
S2	73.900	0.680	Open Manhole	225	S1.001	73.220	100	S1.000	73.220	100	
S3	73.900	0.830	Open Manhole	225	S1.002	73.070	100	S1.001	73.070	100	
S4	73.900	0.600	Open Manhole	225	S2.000	73.300	100				
S5	73.900	0.730	Open Manhole	225	S2.001	73.170	100	S2.000	73.170	100	
S6	73.900	0.510	Open Manhole	100	S3.000	73.390	100				
S4	73.900	0.970	Open Manhole	600	S1.003	72.930	150	S1.002	72.930	100	
								S2.001	72.930	100	
								S3.000	72.930	100	
S8	73.860	0.610	Open Manhole	100	S4.000	73.250	100				
S9	73.760	1.130	Open Manhole	1350	S4.001	72.630	225	S4.000	72.630	100	
S10	73.890	1.340	Open Manhole	1350	S4.002	72.550	225	S4.001	72.550	225	
S5	73.720	1.260	Open Manhole	1350	S1.004	72.460	225	S1.003	72.460	150	
								S4.002	72.460	225	
S12	73.860	0.610	Open Manhole	100	S5.000	73.250	100				
S13	73.770	1.130	Open Manhole	1350	S5.001	72.640	225	S5.000	72.640	100	
S14	73.800	1.300	Open Manhole	1350	S5.002	72.500	225	S5.001	72.500	225	
S15	73.600	0.450	Open Manhole	450	S6.000	73.150	150				
S6	73.670	1.270	Open Manhole	1350	S1.005	72.400	225	S1.004	72.400	225	
								S5.002	72.400	225	
								S6.000	72.400	150	
S17	73.560	0.710	Open Manhole	150	S7.000	72.850	150				
S7	73.640	1.410	Open Manhole	1350	S1.006	72.230	225	S1.005	72.230	225	
								S7.000	72.230	150	
S8	73.640	1.790	Junction		S1.007	71.850	225	S1.006	72.200	225	350
S9	73.570	1.740	Open Manhole	1200	S1.008	71.830	225	S1.007	71.830	225	
S	73.610	1.830	Open Manhole	0		OUTFALL		S1.008	71.780	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	252755.296	364703.438	252755.296	364703.438	Required	
S2	252749.604	364704.936	252749.604	364704.936	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S3	252752.613	364716.370	252752.613	364716.370	Required	
S4	252772.823	364700.117	252772.823	364700.117	Required	
S5	252775.420	364709.988	252775.420	364709.988	Required	
S6	252765.301	364711.037	252765.301	364711.037	Required	
S4	252763.368	364716.543	252763.368	364716.543	Required	
S8	252770.080	364693.533	252770.080	364693.533	Required	
S9	252779.026	364700.114	252779.026	364700.114	Required	
S10	252775.915	364713.036	252775.915	364713.036	Required	
S5	252763.595	364721.005	252763.595	364721.005	Required	
S12	252749.396	364699.003	252749.396	364699.003	Required	
S13	252745.397	364708.333	252745.397	364708.333	Required	
S14	252751.065	364729.753	252751.065	364729.753	Required	
S15	252769.217	364735.191	252769.217	364735.191	Required	
S6	252762.629	364730.883	252762.629	364730.883	Required	
S17	252753.630	364752.164	252753.630	364752.164	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S7	252760.633	364751.316	252760.633	364751.316	Required	
S8	252760.449	364753.308			No Entry	
S9	252758.672	364753.144	252758.672	364753.144	Required	
S	252754.036	364753.931			No Entry	

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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	100	S1	73.900	73.300	0.500	Open Manhole	225
S1.001	o	100	S2	73.900	73.220	0.580	Open Manhole	225
S1.002	o	100	S3	73.900	73.070	0.730	Open Manhole	225
S2.000	o	100	S4	73.900	73.300	0.500	Open Manhole	225
S2.001	o	100	S5	73.900	73.170	0.630	Open Manhole	225
S3.000	o	100	S6	73.900	73.390	0.410	Open Manhole	100
S1.003	o	150	S4	73.900	72.930	0.820	Open Manhole	600
S4.000	o	100	S8	73.860	73.250	0.510	Open Manhole	100
S4.001	o	225	S9	73.760	72.630	0.905	Open Manhole	1350
S4.002	o	225	S10	73.890	72.550	1.115	Open Manhole	1350
S1.004	o	225	S5	73.720	72.460	1.035	Open Manhole	1350
S5.000	o	100	S12	73.860	73.250	0.510	Open Manhole	100
S5.001	o	225	S13	73.770	72.640	0.905	Open Manhole	1350
S5.002	o	225	S14	73.800	72.500	1.075	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)
S1.000	5.885	73.6	S2	73.900	73.220	0.580	Open Manhole	225
S1.001	11.823	78.8	S3	73.900	73.070	0.730	Open Manhole	225
S1.002	10.757	76.8	S4	73.900	72.930	0.870	Open Manhole	600
S2.000	10.207	78.5	S5	73.900	73.170	0.630	Open Manhole	225
S2.001	13.719	57.2	S4	73.900	72.930	0.870	Open Manhole	600
S3.000	5.835	12.7	S4	73.900	72.930	0.870	Open Manhole	600
S1.003	4.468	9.5	S5	73.720	72.460	1.110	Open Manhole	1350
S4.000	11.106	17.9	S9	73.760	72.630	1.030	Open Manhole	1350
S4.001	13.292	166.2	S10	73.890	72.550	1.115	Open Manhole	1350
S4.002	14.673	163.0	S5	73.720	72.460	1.035	Open Manhole	1350
S1.004	9.925	165.4	S6	73.670	72.400	1.045	Open Manhole	1350
S5.000	10.151	16.6	S13	73.770	72.640	1.030	Open Manhole	1350
S5.001	22.157	158.3	S14	73.800	72.500	1.075	Open Manhole	1350
S5.002	11.620	116.2	S6	73.670	72.400	1.045	Open Manhole	1350

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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)
S6.000	o	150	S15	73.600	73.150	0.300	Open Manhole	450
S1.005	o	225	S6	73.670	72.400	1.045	Open Manhole	1350
S7.000	o	150	S17	73.560	72.850	0.560	Open Manhole	150
S1.006	o	225	S7	73.640	72.230	1.185	Open Manhole	1350
S1.007	o	225	S8	73.640	71.850	1.565	Junction	
S1.008	o	225	S9	73.570	71.830	1.515	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)
S6.000	7.872	10.5	S6	73.670	72.400	1.120	Open Manhole	1350
S1.005	20.531	120.8	S7	73.640	72.230	1.185	Open Manhole	1350
S7.000	7.053	11.4	S7	73.640	72.230	1.260	Open Manhole	1350
S1.006	2.000	66.7	S8	73.640	72.200	1.215	Junction	
S1.007	1.784	89.2	S9	73.570	71.830	1.515	Open Manhole	1200
S1.008	4.702	94.0	S	73.610	71.780	1.605	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	-	-	100	0.003	0.003	0.003
1.001	-	-	100	0.005	0.005	0.005
1.002	-	-	100	0.006	0.006	0.006
2.000	-	-	100	0.006	0.006	0.006
2.001	-	-	100	0.006	0.006	0.006
3.000	-	-	100	0.005	0.005	0.005
1.003	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.005	0.005	0.005
4.001	-	-	100	0.013	0.013	0.013
4.002	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.029	0.029	0.029
5.000	-	-	100	0.004	0.004	0.004
5.001	-	-	100	0.029	0.029	0.029
5.002	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.008	0.008	0.008
1.005	-	-	100	0.008	0.008	0.008
7.000	-	-	100	0.045	0.045	0.045
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.172	0.172	0.172

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Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	100	0.500	0.580	Unclassified	225	0	0.500	Unclassified
S1.001	S2	100	0.580	0.730	Unclassified	225	0	0.580	Unclassified
S1.002	S3	100	0.730	0.870	Unclassified	225	0	0.730	Unclassified
S2.000	S4	100	0.500	0.630	Unclassified	225	0	0.500	Unclassified
S2.001	S5	100	0.630	0.870	Unclassified	225	0	0.630	Unclassified
S3.000	S6	100	0.410	0.870	Unclassified	100	0	0.410	Unclassified
S1.003	S4	150	0.820	1.110	Unclassified	600	0	0.820	Unclassified
S4.000	S8	100	0.510	1.030	Unclassified	100	0	0.510	Unclassified
S4.001	S9	225	0.905	1.115	Unclassified	1350	0	0.905	Unclassified
S4.002	S10	225	1.035	1.115	Unclassified	1350	0	1.115	Unclassified
S1.004	S5	225	1.035	1.045	Unclassified	1350	0	1.035	Unclassified
S5.000	S12	100	0.510	1.030	Unclassified	100	0	0.510	Unclassified
S5.001	S13	225	0.905	1.075	Unclassified	1350	0	0.905	Unclassified
S5.002	S14	225	1.045	1.075	Unclassified	1350	0	1.075	Unclassified
S6.000	S15	150	0.300	1.120	Unclassified	450	0	0.300	Unclassified
S1.005	S6	225	1.045	1.185	Unclassified	1350	0	1.045	Unclassified
S7.000	S17	150	0.560	1.260	Unclassified	150	0	0.560	Unclassified
S1.006	S7	225	1.185	1.215	Unclassified	1350	0	1.185	Unclassified
S1.007	S8	225	1.515	1.565	Unclassified				Junction
S1.008	S9	225	1.515	1.605	Unclassified	1200	0	1.515	Unclassified

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)
S1.008	S	73.610	71.780	0.000	0	0

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	0.500
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	M5-60 (mm)	18.150
Return Period (years)	2	Ratio R	0.385
Region	England and Wales	Profile Type	Summer

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Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30
Cv (Winter) 0.840

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S9, DS/PN: S1.008, Volume (m³): 2.0

Unit Reference	MD-SHE-0122-7000-1100-7000
Design Head (m)	1.100
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	122
Invert Level (m)	71.830
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	7.0
Flush-Flo™	0.324	7.0
Kick-Flo®	0.704	5.7
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	4.3	1.200	7.3	3.000	11.2	7.000	16.8
0.200	6.7	1.400	7.8	3.500	12.1	7.500	17.4
0.300	7.0	1.600	8.3	4.000	12.9	8.000	17.9
0.400	6.9	1.800	8.8	4.500	13.6	8.500	18.4
0.500	6.8	2.000	9.3	5.000	14.3	9.000	19.0
0.600	6.5	2.200	9.7	5.500	15.0	9.500	19.5
0.800	6.0	2.400	10.1	6.000	15.6		
1.000	6.7	2.600	10.5	6.500	16.2		

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Storage Structures for Storm

Cellular Storage Manhole: S8, DS/PN: S1.007

Invert Level (m) 71.850 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	45.0	0.0	1.076	0.0	0.0
1.075	45.0	0.0			

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
S1.000	S1	0.500
S1.001	S2	0.500
S1.002	S3	0.500
S2.000	S4	0.500
S2.001	S5	0.500
S3.000	S6	0.500
S1.003	S4	0.500
S4.000	S8	0.500
S4.001	S9	0.500
S4.002	S10	0.500
S1.004	S5	0.500
S5.000	S12	0.500
S5.001	S13	0.500
S5.002	S14	0.500
S6.000	S15	0.500
S1.005	S6	0.500
S7.000	S17	0.500
S1.006	S7	0.500
S1.007	S8	0.000
S1.008	S9	0.500

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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 0.500
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 0.385
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.150 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) 2
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	2	+0%					73.318
S1.001	S2	15 Winter	2	+0%					73.249
S1.002	S3	15 Winter	2	+0%					73.108
S2.000	S4	15 Winter	2	+0%					73.326
S2.001	S5	15 Winter	2	+0%					73.203
S3.000	S6	15 Winter	2	+0%					73.405
S1.003	S4	15 Winter	2	+0%					72.963
S4.000	S8	15 Winter	2	+0%					73.266
S4.001	S9	15 Winter	2	+0%					72.671
S4.002	S10	15 Winter	2	+0%					72.591
S1.004	S5	15 Winter	2	+0%					72.549
S5.000	S12	15 Winter	2	+0%					73.264
S5.001	S13	15 Winter	2	+0%					72.692
S5.002	S14	15 Winter	2	+0%					72.550
S6.000	S15	15 Winter	2	+0%					73.166
S1.005	S6	15 Winter	2	+0%					72.501
S7.000	S17	15 Winter	2	+0%					72.890
S1.006	S7	15 Winter	2	+0%					72.387

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.082	0.000	0.08		0.5	OK	
S1.001	S2	-0.071	0.000	0.18		1.2	OK	
S1.002	S3	-0.062	0.000	0.30		2.0	OK	
S2.000	S4	-0.074	0.000	0.15		1.0	OK	
S2.001	S5	-0.067	0.000	0.23		1.8	OK	
S3.000	S6	-0.085	0.000	0.05		0.8	OK	
S1.003	S4	-0.117	0.000	0.11		4.5	OK	
S4.000	S8	-0.084	0.000	0.06		0.8	OK	
S4.001	S9	-0.184	0.000	0.07		2.6	OK	
S4.002	S10	-0.184	0.000	0.07		2.6	OK	
S1.004	S5	-0.136	0.000	0.33		11.0	OK	
S5.000	S12	-0.086	0.000	0.05		0.6	OK	
S5.001	S13	-0.173	0.000	0.12		4.6	OK	
S5.002	S14	-0.175	0.000	0.11		4.6	OK	
S6.000	S15	-0.134	0.000	0.03		1.3	OK	
S1.005	S6	-0.124	0.000	0.42		17.8	OK	
S7.000	S17	-0.110	0.000	0.16		7.3	OK	
S1.006	S7	-0.068	0.000	0.82		24.5	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.007	S8	30 Winter	2	+0%					72.065
S1.008	S9	30 Winter	2	+0%	2/30 Winter				72.071

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.007	S8	-0.010	0.000	0.26		7.7	OK*	
S1.008	S9	0.016	0.000	0.22		6.8	SURCHARGED	

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