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Barton Arcade Manchester M3 2BH	File: Model_16recover.dwg Network: Surface Water	
Date 26 October 2017 File Surface Water_31.10.17.MDX	Designed by Maria Checked by	
XP Solutions	Network 2015.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Water.SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD









FSR Rainfall Model - England and Wales

Return Period (years)	30	Add Flow / Climate Change (%)	0
M5-60 (mm)	17.200	Minimum Backdrop Height (m)	0.600
Ratio R	0.250	Maximum Backdrop Height (m)	3.000
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	0.500
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 Surface Water.SWS

« - Indicates pipe capacity < flow




PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.000	48.084	2.394	20.1	0.201	5.00	0.0	0.600	o	225	
1.001	21.344	0.107	199.5	0.097	0.00	0.0	0.600	o	375	
2.000	7.442	0.019	391.7	0.025	5.00	0.0	0.600	o	675	
1.002	43.201	0.360	120.0	0.114	0.00	0.0	0.600	o	1050	
1.003	25.600	0.213	120.2	0.065	0.00	0.0	0.600	o	1050	
3.000	24.624	0.164	150.1	0.097	5.00	0.0	0.600	o	375	
3.001	50.017	0.333	150.2	0.164	0.00	0.0	0.600	o	675	
3.002	10.694	0.071	150.6	0.096	0.00	0.0	0.600	o	1050	

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	5.27	96.546	0.201	0.0	0.0	0.0	2.93	116.6	27.2
1.001	50.00	5.55	94.002	0.298	0.0	0.0	0.0	1.28	141.3	40.4
2.000	50.00	5.09	93.614	0.025	0.0	0.0	0.0	1.32	471.7	3.4
1.002	50.00	5.78	93.220	0.437	0.0	0.0	0.0	3.15	2723.3	59.2
1.003	50.00	5.92	92.860	0.502	0.0	0.0	0.0	3.14	2721.2	68.0
3.000	50.00	5.28	93.890	0.097	0.0	0.0	0.0	1.48	163.1	13.1
3.001	50.00	5.67	93.426	0.261	0.0	0.0	0.0	2.14	764.5	35.3
3.002	50.00	5.73	92.718	0.357	0.0	0.0	0.0	2.81	2429.6	48.3


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Network Design Table for Surface Water.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.004	28.166	0.188	149.8	0.013	0.00	0.0	0.600	o	1050	
1.005	20.936	0.403	52.0	0.000	0.00	0.0	0.600	o	225	
1.006	56.437	1.085	52.0	0.000	0.00	0.0	0.600	o	225	


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)
1.004	50.00	6.08	92.647	0.872	0.0	0.0	0.0	2.81	2436.1	118.1
1.005	50.00	6.27	92.459	0.872	0.0	0.0	0.0	1.82	72.3«	118.1
1.006	50.00	6.79	92.056	0.872	0.0	0.0	0.0	1.82	72.3«	118.1

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Manhole Schedules for Surface Water.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out		Pipes In		Backdrop (mm)	
					PN	Invert Level (m)	Diameter (mm)	PN		Invert Level (m)
S1	97.971	1.425	Open Manhole	1350	1.000	96.546	225			
S2	96.965	2.963	Open Manhole	1800	1.001	94.002	375	1.000	94.152	225
S10	95.231	1.617	Open Manhole	1350	2.000	93.614	675			
S3	95.800	2.580	Open Manhole	2700	1.002	93.220	1050	1.001	93.895	375
								2.000	93.595	675
S4	96.584	3.724	Open Manhole	2400	1.003	92.860	1050	1.002	92.860	1050
S11	97.626	3.736	Open Manhole	1350	3.000	93.890	375			
S12	97.771	4.345	Open Manhole	1800	3.001	93.426	675	3.000	93.726	375
S13	96.936	4.218	Open Manhole	1800	3.002	92.718	1050	3.001	93.093	675
								1.003	92.647	1050
S5	96.607	3.960	Open Manhole	2700	1.004	92.647	1050	1.003	92.647	1050
								3.002	92.647	1050
S7	94.709	2.250	Open Manhole	2100	1.005	92.459	225	1.004	92.459	1050
S8	93.687	1.631	Open Manhole	1200	1.006	92.056	225	1.005	92.056	225
S9	94.046	3.075	Open Manhole	1500		OUTFALL		1.006	90.971	225

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PIPELINE SCHEDULES for Surface Water.SWS

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	225	S1	97.971	96.546	1.200	Open Manhole	1350
1.001	o	375	S2	96.965	94.002	2.588	Open Manhole	1800
2.000	o	675	S10	95.231	93.614	0.942	Open Manhole	1350
1.002	o	1050	S3	95.800	93.220	1.530	Open Manhole	2700
1.003	o	1050	S4	96.584	92.860	2.674	Open Manhole	2400
3.000	o	375	S11	97.626	93.890	3.361	Open Manhole	1350
3.001	o	675	S12	97.771	93.426	3.670	Open Manhole	1800
3.002	o	1050	S13	96.936	92.718	3.168	Open Manhole	1800
1.004	o	1050	S5	96.607	92.647	2.910	Open Manhole	2700
1.005	o	225	S7	94.709	92.459	2.025	Open Manhole	2100
1.006	o	225	S8	93.687	92.056	1.406	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	48.084	20.1	S2	96.965	94.152	2.588	Open Manhole	1800
1.001	21.344	199.5	S3	95.800	93.895	1.530	Open Manhole	2700
2.000	7.442	391.7	S3	95.800	93.595	1.530	Open Manhole	2700
1.002	43.201	120.0	S4	96.584	92.860	2.674	Open Manhole	2400
1.003	25.600	120.2	S5	96.607	92.647	2.910	Open Manhole	2700
3.000	24.624	150.1	S12	97.771	93.726	3.670	Open Manhole	1800
3.001	50.017	150.2	S13	96.936	93.093	3.168	Open Manhole	1800
3.002	10.694	150.6	S5	96.607	92.647	2.910	Open Manhole	2700
1.004	28.166	149.8	S7	94.709	92.459	1.200	Open Manhole	2100
1.005	20.936	52.0	S8	93.687	92.056	1.406	Open Manhole	1200
1.006	56.437	52.0	S9	94.046	90.971	2.850	Open Manhole	1500

Free Flowing Outfall Details for Surface Water.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	S9	94.046	90.971	0.000	1500	0


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Simulation Criteria for Surface Water.SWS

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	1.000
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)	240
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	4
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	Winter
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	17.200	Storm Duration (mins)	120
Ratio R	0.250		

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Online Controls for Surface Water.SWS


Hydro-Brake Optimum® Manhole: S7, DS/PN: 1.005, Volume (m³): 30.1

Unit Reference MD-SHE-0117-6200-1000-6200  
Design Head (m) 1.000  
Design Flow (l/s) 6.2  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Diameter (mm) 117  
Invert Level (m) 92.459  
Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	6.2
Flush-Flo™	0.296	6.2
Kick-Flo®	0.648	5.1
Mean Flow over Head Range	-	5.4

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	4.1	1.200	6.7	3.000	10.4	7.000	15.5
0.200	6.0	1.400	7.2	3.500	11.2	7.500	16.0
0.300	6.2	1.600	7.7	4.000	11.9	8.000	16.6
0.400	6.1	1.800	8.1	4.500	12.6	8.500	17.0
0.500	5.9	2.000	8.6	5.000	13.2	9.000	17.5
0.600	5.5	2.200	9.0	5.500	13.8	9.500	18.0
0.800	5.6	2.400	9.3	6.000	14.4		
1.000	6.2	2.600	9.7	6.500	15.0		


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Storage Structures for Surface Water.SWS

Tank or Pond Manhole: S3, DS/PN: 1.002

Invert Level (m) 93.257

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	164.4	1.100	164.4

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Summary Wizard of 15 minute 2 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.000	S1	8	96.628	-0.143	0.000	0.28			31.1	OK	
1.001	S2	8	94.160	-0.217	0.000	0.37			44.1	OK	
2.000	S10	9	93.667	-0.622	0.000	0.02			3.8	OK	
1.002	S3	12	93.322	-0.948	0.000	0.02			37.4	OK	
1.003	S4	12	93.299	-0.611	0.000	0.02			28.4	OK	
3.000	S11	8	93.972	-0.293	0.000	0.11			15.0	OK	
3.001	S12	9	93.529	-0.572	0.000	0.06			36.9	OK	
3.002	S13	12	93.299	-0.469	0.000	0.04			46.3	OK	
1.004	S5	12	93.299	-0.398	0.000	0.03			41.1	OK	
1.005	S7	12	93.300	0.616	0.000	0.09			5.9	SURCHARGED	
1.006	S8	12	92.100	-0.181	0.000	0.08			5.9	OK	



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Summary Wizard of 30 minute 2 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.000	S1	9	96.618	-0.153	0.000	0.23			25.4	OK	
1.001	S2	9	94.144	-0.233	0.000	0.31			36.7	OK	
2.000	S10	10	93.657	-0.632	0.000	0.01			3.2	OK	
1.002	S3	11	93.363	-0.907	0.000	0.02			33.3	OK	
1.003	S4	11	93.363	-0.547	0.000	0.02			21.5	OK	
3.000	S11	9	93.964	-0.301	0.000	0.09			12.3	OK	
3.001	S12	10	93.520	-0.581	0.000	0.05			31.3	OK	
3.002	S13	11	93.363	-0.405	0.000	0.03			39.8	OK	
1.004	S5	11	93.363	-0.334	0.000	0.02			31.3	OK	
1.005	S7	11	93.363	0.679	0.000	0.09			5.9	SURCHARGED	
1.006	S8	11	92.100	-0.181	0.000	0.08			5.9	OK	

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Summary Wizard of 60 minute 2 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.000	S1	11	96.606	-0.165	0.000	0.16	17.8	OK			
1.001	S2	11	94.120	-0.257	0.000	0.22	26.1	OK			
2.000	S10	11	93.644	-0.645	0.000	0.01	2.2	OK			
1.002	S3	10	93.424	-0.846	0.000	0.01	23.9	OK			
1.003	S4	10	93.424	-0.486	0.000	0.01	16.3	OK			
3.000	S11	11	93.950	-0.315	0.000	0.06	8.6	OK			
3.001	S12	11	93.507	-0.594	0.000	0.03	22.6	OK			
3.002	S13	10	93.424	-0.344	0.000	0.02	27.5	OK			
1.004	S5	10	93.424	-0.273	0.000	0.02	22.3	OK			
1.005	S7	10	93.424	0.740	0.000	0.09	6.1	SURCHARGED			
1.006	S8	10	92.101	-0.180	0.000	0.09	6.1	OK			

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Summary Wizard of 120 minute 2 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water Surcharged Flooded			Pipe		Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S1	12	96.594	-0.177	0.000	0.10	11.7	OK
1.001	S2	12	94.096	-0.281	0.000	0.14	17.3	OK
2.000	S10	12	93.634	-0.655	0.000	0.01	1.5	OK
1.002	S3	9	93.474	-0.796	0.000	0.01	16.7	OK
1.003	S4	9	93.476	-0.434	0.000	0.01	13.7	OK
3.000	S11	12	93.938	-0.327	0.000	0.04	5.6	OK
3.001	S12	12	93.495	-0.606	0.000	0.02	15.1	OK
3.002	S13	9	93.476	-0.292	0.000	0.01	17.5	OK
1.004	S5	9	93.476	-0.221	0.000	0.01	15.7	OK
1.005	S7	9	93.477	0.793	0.000	0.09	6.2	SURCHARGED
1.006	S8	9	92.101	-0.180	0.000	0.09	6.2	OK

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Summary Wizard of 15 minute 30 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins)                      0                      MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)                      19.100 Cv (Winter) 0.840

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

Profile(s)                      Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years)                      2, 30, 100  
Climate Change (%)                      0, 0, 30

PN	US/MH Name	Storm Rank	Water		Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
1.000	S1	3	96.664	-0.107	0.000	0.53	58.8	OK		
1.001	S2	5	94.247	-0.130	0.000	0.73	87.9	OK		
2.000	S10	7	93.692	-0.597	0.000	0.03	7.4	OK		
1.002	S3	8	93.490	-0.780	0.000	0.04	73.0	OK		
1.003	S4	8	93.490	-0.420	0.000	0.02	33.6	OK		
3.000	S11	5	94.005	-0.260	0.000	0.20	28.4	OK		
3.001	S12	8	93.582	-0.519	0.000	0.12	79.6	OK		
3.002	S13	8	93.490	-0.278	0.000	0.08	98.2	OK		
1.004	S5	8	93.490	-0.207	0.000	0.04	60.3	OK		
1.005	S7	8	93.490	0.806	0.000	0.10	6.3	SURCHARGED		
1.006	S8	8	92.101	-0.180	0.000	0.09	6.3	OK		

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Summary Wizard of 30 minute 30 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water Surcharged Flooded			Pipe		Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S1	5	96.649	-0.122	0.000	0.43	48.4	OK
1.001	S2	6	94.213	-0.164	0.000	0.60	72.1	OK
2.000	S10	8	93.686	-0.603	0.000	0.03	6.0	OK
1.002	S3	7	93.619	-0.651	0.000	0.03	46.6	OK
1.003	S4	7	93.619	-0.291	0.000	0.02	24.1	OK
3.000	S11	6	93.992	-0.273	0.000	0.17	23.4	OK
3.001	S12	7	93.619	-0.482	0.000	0.10	63.3	OK
3.002	S13	7	93.619	-0.149	0.000	0.05	67.9	OK
1.004	S5	7	93.619	-0.078	0.000	0.03	41.3	OK
1.005	S7	7	93.619	0.935	0.000	0.10	6.6	SURCHARGED
1.006	S8	7	92.102	-0.179	0.000	0.10	6.6	OK

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Summary Wizard of 60 minute 30 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water		Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
1.000	S1	7	96.630	-0.141	0.000	0.30	33.8	OK		
1.001	S2	7	94.171	-0.206	0.000	0.42	50.2	OK		
2.000	S10	6	93.762	-0.527	0.000	0.02	4.2	OK		
1.002	S3	6	93.762	-0.508	0.000	0.01	23.1	OK		
1.003	S4	6	93.764	-0.146	0.000	0.01	15.3	OK		
3.000	S11	7	93.974	-0.291	0.000	0.12	16.3	OK		
3.001	S12	6	93.764	-0.337	0.000	0.07	43.7	OK		
3.002	S13	6	93.764	-0.004	0.000	0.04	48.2	OK		
1.004	S5	6	93.765	0.068	0.000	0.02	24.2	SURCHARGED		
1.005	S7	6	93.765	1.081	0.000	0.11	7.0	SURCHARGED		
1.006	S8	6	92.104	-0.177	0.000	0.10	7.0	OK		

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Summary Wizard of 120 minute 30 year Winter I+0% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.000	S1	10	96.613	-0.158	0.000	0.20			22.0	OK	
1.001	S2	10	94.135	-0.242	0.000	0.27			32.6	OK	
2.000	S10	4	93.907	-0.382	0.000	0.01			2.7	OK	
1.002	S3	4	93.907	-0.363	0.000	0.01			15.3	OK	
1.003	S4	4	93.937	0.027	0.000	0.02			23.8	SURCHARGED	
3.000	S11	10	93.958	-0.307	0.000	0.08			10.6	OK	
3.001	S12	4	93.924	-0.177	0.000	0.04			28.1	OK	
3.002	S13	4	93.946	0.178	0.000	0.02			29.6	SURCHARGED	
1.004	S5	4	93.944	0.247	0.000	0.01			16.3	SURCHARGED	
1.005	S7	4	93.971	1.287	0.000	0.11			7.3	SURCHARGED	
1.006	S8	4	92.105	-0.176	0.000	0.11			7.3	OK	

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Summary Wizard of 15 minute 100 year Winter I+30% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water Surcharged			Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)		
1.000	S1	1	96.713	-0.058	0.000	0.88	98.8	OK	
1.001	S2	3	94.424	0.047	0.000	1.23	147.2	SURCHARGED	
2.000	S10	5	93.769	-0.520	0.000	0.05	12.4	OK	
1.002	S3	5	93.769	-0.501	0.000	0.05	85.3	OK	
1.003	S4	5	93.770	-0.140	0.000	0.03	36.2	OK	
3.000	S11	4	94.042	-0.223	0.000	0.34	47.6	OK	
3.001	S12	5	93.770	-0.331	0.000	0.20	132.4	OK	
3.002	S13	5	93.769	0.001	0.000	0.11	139.9	SURCHARGED	
1.004	S5	5	93.769	0.072	0.000	0.06	78.7	SURCHARGED	
1.005	S7	5	93.770	1.086	0.000	0.11	7.0	SURCHARGED	
1.006	S8	5	92.104	-0.177	0.000	0.10	7.0	OK	



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Summary Wizard of 30 minute 100 year Winter I+30% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water Surcharged			Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)		
1.000	S1	2	96.690	-0.081	0.000	0.74	82.1	OK	
1.001	S2	4	94.370	-0.007	0.000	1.00	119.6	OK	
2.000	S10	3	94.057	-0.232	0.000	0.04	10.2	OK	
1.002	S3	3	94.057	-0.213	0.000	0.03	52.1	OK	
1.003	S4	3	94.099	0.189	0.000	0.02	25.9	SURCHARGED	
3.000	S11	3	94.067	-0.198	0.000	0.28	39.6	OK	
3.001	S12	3	94.072	-0.029	0.000	0.16	105.9	OK	
3.002	S13	3	94.099	0.331	0.000	0.09	107.6	SURCHARGED	
1.004	S5	3	94.097	0.400	0.000	0.03	47.4	SURCHARGED	
1.005	S7	3	94.114	1.430	0.000	0.12	7.7	SURCHARGED	
1.006	S8	3	92.106	-0.175	0.000	0.11	7.7	OK	

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Summary Wizard of 60 minute 100 year Winter I+30% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water		Surcharged		Flooded		Pipe		Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
1.000	S1	4	96.661	-0.110	0.000	0.52			57.8		OK
1.001	S2	2	94.449	0.072	0.000	0.72			85.8		SURCHARGED
2.000	S10	2	94.441	0.152	0.000	0.03			7.1		SURCHARGED
1.002	S3	2	94.441	0.171	0.000	0.03			47.0		SURCHARGED
1.003	S4	2	94.492	0.582	0.000	0.03			39.3		SURCHARGED
3.000	S11	2	94.533	0.268	0.000	0.20			27.9		SURCHARGED
3.001	S12	2	94.534	0.433	0.000	0.11			72.7		SURCHARGED
3.002	S13	2	94.536	0.768	0.000	0.06			76.7		SURCHARGED
1.004	S5	2	94.536	0.839	0.000	0.02			27.1		SURCHARGED
1.005	S7	2	94.554	1.870	0.000	0.13			8.4		FLOOD RISK
1.006	S8	2	92.108	-0.173	0.000	0.12			8.4		OK

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Summary Wizard of 120 minute 100 year Winter I+30% for Surface Water.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
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 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 0.300  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.100 Cv (Winter) 0.840

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

Profile(s) Winter  
Duration(s) (mins) 15, 30, 60, 120  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm Rank	Water Surcharged			Flooded		Pipe Flow (l/s)	Status
			Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)		
1.000	S1	6	96.636	-0.135	0.000	0.34	37.5	OK	
1.001	S2	1	94.728	0.351	0.000	0.46	55.6	SURCHARGED	
2.000	S10	1	94.724	0.435	0.000	0.02	4.1	SURCHARGED	
1.002	S3	1	94.724	0.454	0.000	0.05	88.7	SURCHARGED	
1.003	S4	1	94.783	0.873	0.000	0.05	77.0	SURCHARGED	
3.000	S11	1	94.762	0.497	0.000	0.13	18.1	SURCHARGED	
3.001	S12	1	94.793	0.692	0.000	0.07	46.2	SURCHARGED	
3.002	S13	1	94.811	1.043	0.000	0.05	64.7	SURCHARGED	
1.004	S5	1	94.816	1.119	0.000	0.05	71.6	SURCHARGED	
1.005	S7	1	94.723	2.039	13.850	0.14	9.1	FLOOD	
1.006	S8	1	92.110	-0.171	0.000	0.13	9.1	OK	