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Park House Sandpiper Court Chester CH4 9QU	Boozey Field SW Design	
Date March 2017	Designed by AJ	
File 6568 SW03 Pond raised.mdx	Checked by AJ	
Micro Drainage		Network 2015.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for 6568 SW01.SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.320	Maximum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	0	Min Design Depth for Optimisation (m)	1.500
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	0.75
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 6568 SW01.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
1.000	29.682	1.370	21.7	0.108	5.00	0.0	0.600	0	225	
1.001	27.845	1.010	27.6	0.054	0.00	0.0	0.600	0	225	
1.002	17.096	0.626	27.3	0.054	0.00	0.0	0.600	0	225	
1.003	40.066	1.956	20.5	0.054	0.00	0.0	0.600	0	225	
2.000	11.814	0.069	170.0	0.054	5.00	0.0	0.600	0	225	
1.004	22.344	1.606	13.9	0.054	0.00	0.0	0.600	0	225	
1.005	14.324	1.009	14.2	0.054	0.00	0.0	0.600	0	225	
1.006	27.838	1.401	19.9	0.054	0.00	0.0	0.600	0	225	
1.007	17.852	0.445	40.1	0.054	0.00	0.0	0.600	0	225	
1.008	33.413	1.237	27.0	0.054	0.00	0.0	0.600	0	300	
3.000	25.526	0.150	170.0	0.054	5.00	0.0	0.600	0	225	
1.009	9.509	0.048	198.1	0.054	0.00	0.0	0.600	0	375	
1.010	10.574	0.068	155.7	0.054	0.00	0.0	0.600	0	375	

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	0.00	5.18	105.435	0.108	0.0	0.0	0.0	2.82	112.3	0.0
1.001	0.00	5.36	104.065	0.162	0.0	0.0	0.0	2.50	99.5	0.0
1.002	0.00	5.47	103.055	0.216	0.0	0.0	0.0	2.51	99.9	0.0
1.003	0.00	5.70	102.429	0.270	0.0	0.0	0.0	2.90	115.5	0.0
2.000	0.00	5.20	100.542	0.054	0.0	0.0	0.0	1.00	39.8	0.0
1.004	0.00	5.81	100.473	0.378	0.0	0.0	0.0	3.53	140.2	0.0
1.005	0.00	5.88	98.867	0.432	0.0	0.0	0.0	3.49	138.8	0.0
1.006	0.00	6.04	97.858	0.486	0.0	0.0	0.0	2.95	117.3	0.0
1.007	0.00	6.18	96.457	0.540	0.0	0.0	0.0	2.07	82.4	0.0
1.008	0.00	6.36	95.937	0.594	0.0	0.0	0.0	3.04	214.7	0.0
3.000	0.00	5.43	94.925	0.054	0.0	0.0	0.0	1.00	39.8	0.0
1.009	0.00	6.49	94.625	0.702	0.0	0.0	0.0	1.28	141.8	0.0
1.010	0.00	6.61	94.577	0.756	0.0	0.0	0.0	1.45	160.1	0.0

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Network Design Table for 6568 SW01.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
1.011	29.673	1.787	16.6	0.054	0.00	0.0	0.600	0	375	
4.000	29.489	0.803	36.7	0.054	5.00	0.0	0.600	0	225	
1.012	21.639	0.108	200.4	0.046	0.00	0.0	0.600	0	375	
1.013	15.787	0.158	99.9	0.000	0.00	0.0	0.600	0	150	

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)
1.011	0.00	6.72	94.509	0.810	0.0	0.0	0.0	4.47	493.2	0.0
4.000	0.00	5.23	93.675	0.054	0.0	0.0	0.0	2.17	86.1	0.0
1.012	0.00	7.00	92.722	0.910	0.0	0.0	0.0	1.28	141.0	0.0
1.013	0.00	7.26	92.614	0.910	0.0	0.0	0.0	1.01	17.8	0.0

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Manhole Schedules for 6568 SW01.SWS

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)	Backdrop (mm)
1	107.160	1.725	Open Manhole	1200	1.000	105.435	225				
3	105.790	1.725	Open Manhole	1200	1.001	104.065	225	1.000	104.065	225	
4	104.780	1.725	Open Manhole	1200	1.002	103.055	225	1.001	103.055	225	
5	104.154	1.725	Open Manhole	1200	1.003	102.429	225	1.002	102.429	225	
6	102.267	1.725	Open Manhole	1200	2.000	100.542	225				
7	102.223	1.750	Open Manhole	1200	1.004	100.473	225	1.003	100.473	225	
								2.000	100.473	225	
8	100.592	1.725	Open Manhole	1200	1.005	98.867	225	1.004	98.867	225	
9	99.583	1.725	Open Manhole	1200	1.006	97.858	225	1.005	97.858	225	
10	98.182	1.725	Open Manhole	1200	1.007	96.457	225	1.006	96.457	225	
11	97.737	1.800	Open Manhole	1200	1.008	95.937	300	1.007	96.012	225	
12	96.650	1.725	Open Manhole	1200	3.000	94.925	225				
13	97.177	2.552	Open Manhole	1350	1.009	94.625	375	1.008	94.700	300	
								3.000	94.775	225	
14	97.022	2.445	Open Manhole	1350	1.010	94.577	375	1.009	94.577	375	
id	96.850	2.341	Open Manhole	1350	1.011	94.509	375	1.010	94.509	375	
17	95.400	1.725	Open Manhole	1200	4.000	93.675	225				
18	96.100	3.378	Open Manhole	1350	1.012	92.722	375	1.011	92.722	375	
								4.000	92.872	225	
19	94.600	1.986	Open Manhole	2400	1.013	92.614	150	1.012	92.614	375	
20	94.100	1.644	Open Manhole	0		OUTFALL		1.013	92.456	150	

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PIPELINE SCHEDULES for 6568 SW01.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	1	107.160	105.435	1.500	Open Manhole	1200
1.001	o	225	3	105.790	104.065	1.500	Open Manhole	1200
1.002	o	225	4	104.780	103.055	1.500	Open Manhole	1200
1.003	o	225	5	104.154	102.429	1.500	Open Manhole	1200
2.000	o	225	6	102.267	100.542	1.500	Open Manhole	1200
1.004	o	225	7	102.223	100.473	1.525	Open Manhole	1200
1.005	o	225	8	100.592	98.867	1.500	Open Manhole	1200
1.006	o	225	9	99.583	97.858	1.500	Open Manhole	1200
1.007	o	225	10	98.182	96.457	1.500	Open Manhole	1200
1.008	o	300	11	97.737	95.937	1.500	Open Manhole	1200
3.000	o	225	12	96.650	94.925	1.500	Open Manhole	1200
1.009	o	375	13	97.177	94.625	2.177	Open Manhole	1350
1.010	o	375	14	97.022	94.577	2.070	Open Manhole	1350
1.011	o	375	id	96.850	94.509	1.966	Open Manhole	1350
4.000	o	225	17	95.400	93.675	1.500	Open Manhole	1200
1.012	o	375	18	96.100	92.722	3.003	Open Manhole	1350
1.013	o	150	19	94.600	92.614	1.836	Open Manhole	2400

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	29.682	21.7	3	105.790	104.065	1.500	Open Manhole	1200
1.001	27.845	27.6	4	104.780	103.055	1.500	Open Manhole	1200
1.002	17.096	27.3	5	104.154	102.429	1.500	Open Manhole	1200
1.003	40.066	20.5	7	102.223	100.473	1.525	Open Manhole	1200
2.000	11.814	170.0	7	102.223	100.473	1.525	Open Manhole	1200
1.004	22.344	13.9	8	100.592	98.867	1.500	Open Manhole	1200
1.005	14.324	14.2	9	99.583	97.858	1.500	Open Manhole	1200
1.006	27.838	19.9	10	98.182	96.457	1.500	Open Manhole	1200
1.007	17.852	40.1	11	97.737	96.012	1.500	Open Manhole	1200
1.008	33.413	27.0	13	97.177	94.700	2.177	Open Manhole	1350
3.000	25.526	170.0	13	97.177	94.775	2.177	Open Manhole	1350
1.009	9.509	198.1	14	97.022	94.577	2.070	Open Manhole	1350
1.010	10.574	155.7	id	96.850	94.509	1.966	Open Manhole	1350
1.011	29.673	16.6	18	96.100	92.722	3.003	Open Manhole	1350
4.000	29.489	36.7	18	96.100	92.872	3.003	Open Manhole	1350
1.012	21.639	200.4	19	94.600	92.614	1.611	Open Manhole	2400
1.013	15.787	99.9	20	94.100	92.456	1.494	Open Manhole	0

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Free Flowing Outfall Details for 6568 SW01.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.013	20	94.100	92.456	0.000	0	0
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Simulation Criteria for 6568 SW01.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.320		

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Online Controls for 6568 SW01.SWS

Hydro-Brake Optimum® Manhole: 19, DS/PN: 1.013, Volume (m³): 11.2

Unit Reference	MD-SHE-0100-5000-1350-5000
Design Head (m)	1.350
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	100
Invert Level (m)	92.614
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.350	5.0	Kick-Flo®	0.825	4.0
Flush-Flo™	0.401	5.0	Mean Flow over Head Range	-	4.4

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)	Depth (m)	Flow (l/s)
0.100	3.3	0.800	4.1	2.000	6.0	4.000	8.3	7.000	10.8
0.200	4.6	1.000	4.3	2.200	6.3	4.500	8.8	7.500	11.2
0.300	4.9	1.200	4.7	2.400	6.5	5.000	9.2	8.000	11.6
0.400	5.0	1.400	5.1	2.600	6.8	5.500	9.7	8.500	11.9
0.500	4.9	1.600	5.4	3.000	7.3	6.000	10.1	9.000	12.2
0.600	4.8	1.800	5.7	3.500	7.8	6.500	10.5	9.500	12.5

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Storage Structures for 6568 SW01.SWS

Complex Manhole: 19, DS/PN: 1.013

Tank or Pond

Invert Level (m) 93.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	520.0	0.600	0.0	1.200	0.0	1.800	0.0	2.400	0.0
0.100	520.0	0.700	0.0	1.300	0.0	1.900	0.0	2.500	0.0
0.200	520.0	0.800	0.0	1.400	0.0	2.000	0.0		
0.300	520.0	0.900	0.0	1.500	0.0	2.100	0.0		
0.400	520.0	1.000	0.0	1.600	0.0	2.200	0.0		
0.500	520.0	1.100	0.0	1.700	0.0	2.300	0.0		

Tank or Pond

Invert Level (m) 94.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	440.0	0.600	636.6	1.200	0.0	1.800	0.0	2.400	0.0
0.100	470.2	0.700	0.0	1.300	0.0	1.900	0.0	2.500	0.0
0.200	501.5	0.800	0.0	1.400	0.0	2.000	0.0		
0.300	533.8	0.900	0.0	1.500	0.0	2.100	0.0		
0.400	567.0	1.000	0.0	1.600	0.0	2.200	0.0		
0.500	601.3	1.100	0.0	1.700	0.0	2.300	0.0		

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m ³)	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
1.000	1	1.951	1.180	0.000	3.131
1.001	3	1.951	1.107	0.000	3.058
1.002	4	1.951	0.680	0.000	2.631
1.003	5	1.951	1.593	0.000	3.544
2.000	6	1.951	0.470	0.000	2.421
1.004	7	1.980	0.888	0.000	2.868
1.005	8	1.951	0.570	0.000	2.521
1.006	9	1.951	1.107	0.000	3.058
1.007	10	1.951	0.710	0.000	2.661
1.008	11	2.036	2.362	0.000	4.398
3.000	12	1.951	1.015	0.000	2.966
1.009	13	3.654	1.050	0.000	4.704
1.010	14	3.500	1.168	0.000	4.668
1.011	id	3.351	3.277	0.000	6.629
4.000	17	1.951	1.173	0.000	3.123
1.012	18	4.836	2.390	0.000	7.226
1.013	19	8.986	0.279	619.713	628.978
Total		47.855	21.018	619.713	688.586

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.322 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
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
	Name	Storm							(m)	(m)
1.000	1	15 Winter	1	+0%					105.487	-0.173
1.001	3	15 Winter	1	+0%	100/15 Summer				104.132	-0.158
1.002	4	15 Winter	1	+0%	100/15 Summer				103.133	-0.147
1.003	5	15 Winter	1	+0%	100/15 Summer				102.507	-0.147
2.000	6	15 Winter	1	+0%	30/15 Winter	100/15 Winter			100.608	-0.159
1.004	7	15 Winter	1	+0%	30/15 Winter	100/15 Winter			100.559	-0.139
1.005	8	15 Winter	1	+0%	30/15 Summer	100/15 Summer			98.962	-0.130
1.006	9	15 Winter	1	+0%	30/15 Summer	100/15 Summer			97.965	-0.117
1.007	10	15 Winter	1	+0%	30/15 Summer				96.603	-0.078
1.008	11	15 Winter	1	+0%	100/15 Summer				96.051	-0.186
3.000	12	15 Winter	1	+0%	30/15 Summer				94.988	-0.162
1.009	13	15 Winter	1	+0%	30/15 Summer				94.857	-0.143
1.010	14	15 Winter	1	+0%	30/15 Summer				94.814	-0.138
1.011	id	15 Winter	1	+0%					94.619	-0.265
4.000	17	15 Winter	1	+0%	100/60 Summer				93.717	-0.183
1.012	18	120 Winter	1	+0%	1/15 Summer				93.208	0.111
1.013	19	240 Winter	1	+0%	1/15 Summer				93.146	0.383

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)			
1.000	1	0.000	0.12	12.5		OK	
1.001	3	0.000	0.19	17.7		OK	
1.002	4	0.000	0.26	23.0		OK	
1.003	5	0.000	0.26	28.5		OK	
2.000	6	0.000	0.18	6.2		OK	1

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

PN	US/MH Name	Flooded		Pipe	Status	Level	
		Volume (m³)	Flow / Cap.	Overflow (l/s)		Flow (l/s)	Exceeded
1.004	7	0.000	0.31		40.0	OK	1
1.005	8	0.000	0.37		45.3	OK	4
1.006	9	0.000	0.46		50.6	OK	5
1.007	10	0.000	0.76		55.7	OK	
1.008	11	0.000	0.31		60.7	OK	
3.000	12	0.000	0.17		6.2	OK	
1.009	13	0.000	0.69		71.3	OK	
1.010	14	0.000	0.72		76.8	OK	
1.011	id	0.000	0.19		81.8	OK	
4.000	17	0.000	0.08		6.3	OK	
1.012	18	0.000	0.32		38.5	SURCHARGED	
1.013	19	0.000	0.30		5.0	SURCHARGED	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.322 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
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH		Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
	Name	Storm							(m)	(m)
1.000	1	15 Winter	2	+0%					105.494	-0.166
1.001	3	15 Winter	2	+0%	100/15 Summer				104.142	-0.148
1.002	4	15 Winter	2	+0%	100/15 Summer				103.146	-0.134
1.003	5	15 Winter	2	+0%	100/15 Summer				102.520	-0.134
2.000	6	15 Winter	2	+0%	30/15 Winter	100/15 Winter			100.617	-0.150
1.004	7	15 Winter	2	+0%	30/15 Winter	100/15 Winter			100.572	-0.125
1.005	8	15 Winter	2	+0%	30/15 Summer	100/15 Summer			98.977	-0.114
1.006	9	15 Winter	2	+0%	30/15 Summer	100/15 Summer			97.984	-0.099
1.007	10	15 Winter	2	+0%	30/15 Summer				96.634	-0.048
1.008	11	15 Winter	2	+0%	100/15 Summer				96.068	-0.168
3.000	12	15 Winter	2	+0%	30/15 Summer				94.997	-0.153
1.009	13	15 Winter	2	+0%	30/15 Summer				94.904	-0.096
1.010	14	15 Winter	2	+0%	30/15 Summer				94.862	-0.089
1.011	id	15 Winter	2	+0%					94.634	-0.249
4.000	17	15 Winter	2	+0%	100/60 Summer				93.723	-0.177
1.012	18	120 Winter	2	+0%	1/15 Summer				93.260	0.164
1.013	19	240 Winter	2	+0%	1/15 Summer				93.205	0.441

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)			
1.000	1	0.000	0.15	16.2		OK	
1.001	3	0.000	0.25	22.9		OK	
1.002	4	0.000	0.33	29.8		OK	
1.003	5	0.000	0.34	36.8		OK	
2.000	6	0.000	0.24	8.1		OK	1

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

PN	US/MH Name	Flooded		Pipe	Status	Level	
		Volume (m³)	Flow / Cap.	Overflow (l/s)		Flow (l/s)	Exceeded
1.004	7	0.000	0.40		51.8	OK	1
1.005	8	0.000	0.48		58.7	OK	4
1.006	9	0.000	0.60		65.5	OK	5
1.007	10	0.000	0.98		72.1	OK	
1.008	11	0.000	0.40		78.6	OK	
3.000	12	0.000	0.22		8.0	OK	
1.009	13	0.000	0.89		92.3	OK	
1.010	14	0.000	0.93		99.4	OK	
1.011	id	0.000	0.24		106.0	OK	
4.000	17	0.000	0.10		8.1	OK	
1.012	18	0.000	0.40		48.2	SURCHARGED	
1.013	19	0.000	0.30		5.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.322 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
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
									(m)	(m)
1.000	1	15 Winter	30	+0%					105.518	-0.142
1.001	3	15 Winter	30	+0%	100/15 Summer				104.179	-0.111
1.002	4	15 Winter	30	+0%	100/15 Summer				103.197	-0.083
1.003	5	15 Winter	30	+0%	100/15 Summer				102.573	-0.081
2.000	6	15 Winter	30	+0%	30/15 Winter	100/15 Winter			100.781	0.014
1.004	7	15 Winter	30	+0%	30/15 Winter	100/15 Winter			100.760	0.063
1.005	8	15 Winter	30	+0%	30/15 Summer	100/15 Summer			99.887	0.795
1.006	9	15 Winter	30	+0%	30/15 Summer	100/15 Summer			99.131	1.048
1.007	10	15 Winter	30	+0%	30/15 Summer				97.534	0.853
1.008	11	15 Winter	30	+0%	100/15 Summer				96.123	-0.113
3.000	12	15 Winter	30	+0%	30/15 Summer				95.286	0.136
1.009	13	15 Winter	30	+0%	30/15 Summer				95.254	0.254
1.010	14	15 Winter	30	+0%	30/15 Summer				95.074	0.122
1.011	id	15 Winter	30	+0%					94.683	-0.201
4.000	17	15 Winter	30	+0%	100/60 Summer				93.742	-0.158
1.012	18	240 Winter	30	+0%	1/15 Summer				93.514	0.418
1.013	19	480 Winter	30	+0%	1/15 Summer				93.508	0.745

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)			
1.000	1	0.000	0.29	30.7		OK	
1.001	3	0.000	0.51	46.7		OK	
1.002	4	0.000	0.71	62.8		OK	
1.003	5	0.000	0.72	78.9		OK	
2.000	6	0.000	0.42	14.4	SURCHARGED		1

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

PN	US/MH Name	Flooded		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)		
1.004	7	0.000	0.83	106.2	SURCHARGED	1
1.005	8	0.000	0.88	106.7	SURCHARGED	4
1.006	9	0.000	1.06	116.0	SURCHARGED	5
1.007	10	0.000	1.71	126.1	SURCHARGED	
1.008	11	0.000	0.69	136.7	OK	
3.000	12	0.000	0.39	14.3	SURCHARGED	
1.009	13	0.000	1.59	163.6	SURCHARGED	
1.010	14	0.000	1.65	176.8	SURCHARGED	
1.011	id	0.000	0.44	190.3	OK	
4.000	17	0.000	0.19	15.3	OK	
1.012	18	0.000	0.48	56.9	SURCHARGED	
1.013	19	0.000	0.30	5.0	SURCHARGED	

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Park House Sandpiper Court Chester CH4 9QU	Boozey Field SW Design	
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Micro Drainage	Network 2015.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.322 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
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
									(m)	(m)
1.000	1	15 Winter	100	+30%					105.547	-0.113
1.001	3	15 Winter	100	+30%	100/15 Summer				104.579	0.289
1.002	4	15 Winter	100	+30%	100/15 Summer				104.151	0.871
1.003	5	15 Winter	100	+30%	100/15 Summer				103.681	1.027
2.000	6	15 Winter	100	+30%	30/15 Winter	100/15 Winter			102.267	1.500
1.004	7	15 Winter	100	+30%	30/15 Winter	100/15 Winter			102.223	1.526
1.005	8	15 Winter	100	+30%	30/15 Summer	100/15 Summer			100.598	1.506
1.006	9	15 Winter	100	+30%	30/15 Summer	100/15 Summer			99.588	1.506
1.007	10	15 Winter	100	+30%	30/15 Summer				98.000	1.318
1.008	11	15 Winter	100	+30%	100/15 Summer				96.379	0.143
3.000	12	15 Winter	100	+30%	30/15 Summer				95.594	0.444
1.009	13	15 Winter	100	+30%	30/15 Summer				95.519	0.519
1.010	14	15 Winter	100	+30%	30/15 Summer				95.226	0.275
1.011	id	15 Winter	100	+30%					94.717	-0.166
4.000	17	600 Winter	100	+30%	100/60 Summer				94.549	0.649
1.012	18	600 Winter	100	+30%	1/15 Summer				94.548	1.451
1.013	19	600 Winter	100	+30%	1/15 Summer				94.544	1.780

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	Overflow		
1.000	1	0.000	0.49	51.4		OK	
1.001	3	0.000	0.79	72.6		SURCHARGED	
1.002	4	0.000	0.96	85.7		SURCHARGED	
1.003	5	0.000	0.91	99.3		SURCHARGED	
2.000	6	0.149	0.63	21.4		FLOOD	1

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Micro Drainage	Network 2015.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 6568 SW01.SWS

PN	US/MH Name	Flooded		Pipe	Status	Level Exceeded	
		Volume (m³)	Flow / Cap.	Overflow (l/s)			Flow (l/s)
1.004	7	0.037	1.00		128.3	FLOOD	1
1.005	8	5.553	1.00		121.3	FLOOD	4
1.006	9	5.331	1.18		129.0	FLOOD	5
1.007	10	0.000	1.91		140.6	FLOOD RISK	
1.008	11	0.000	0.83		163.4	SURCHARGED	
3.000	12	0.000	0.66		24.1	SURCHARGED	
1.009	13	0.000	2.04		210.1	SURCHARGED	
1.010	14	0.000	2.18		233.3	SURCHARGED	
1.011	id	0.000	0.59		256.8	OK	
4.000	17	0.000	0.04		3.3	SURCHARGED	
1.012	18	0.000	0.41		49.1	SURCHARGED	
1.013	19	0.000	0.36		5.9	FLOOD RISK	