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Raven House 29 Linkfield Lane Surrey RH1 1SS	Greenwood Place	
Date 01/12/2016	Designed by ST	
File gw.mdx	Checked by MB	
XP Solutions	Network 2016.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.800	Add Flow / Climate Change (%)	0
Ratio R	0.441	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	5.253	0.023	225.0	0.014	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	11.533	0.051	225.0	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	7.870	0.035	225.0	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	5.866	0.026	225.0	0.001	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	8.868	0.039	225.0	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	4.637	0.021	225.0	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	6.592	0.066	100.0	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	10.437	0.104	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	3.508	0.036	97.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	21.796	0.097	225.0	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	2.401	0.153	15.7	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.007	7.089	0.181	39.2	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	8.867	0.089	99.6	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.10	35.515	0.014	0.0	0.0	0.0	0.87	34.5	1.9
1.001	50.00	5.32	35.492	0.028	0.0	0.0	0.0	0.87	34.5	3.8
1.002	50.00	5.47	35.440	0.038	0.0	0.0	0.0	0.87	34.5	5.2
1.003	50.00	5.59	35.405	0.039	0.0	0.0	0.0	0.87	34.5	5.3
1.004	50.00	5.76	35.379	0.056	0.0	0.0	0.0	0.87	34.5	7.6
1.005	50.00	5.83	35.265	0.068	0.0	0.0	0.0	1.04	73.8	9.2
2.000	50.00	5.11	35.600	0.029	0.0	0.0	0.0	1.00	17.8	3.9
2.001	50.00	5.28	35.534	0.029	0.0	0.0	0.0	1.00	17.8	3.9
2.002	50.00	5.34	35.430	0.029	0.0	0.0	0.0	1.02	18.0	3.9
1.006	50.00	6.18	35.244	0.123	0.0	0.0	0.0	1.04	73.8	16.6
3.000	50.00	5.02	35.500	0.000	0.0	0.0	0.0	1.96	15.4	0.0
1.007	50.00	6.23	35.147	0.140	0.0	0.0	0.0	2.52	178.1	18.9
4.000	50.00	5.15	35.340	0.029	0.0	0.0	0.0	1.01	17.8	3.9

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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
4.001	13.469	0.135	99.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	3.035	0.379	8.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	6.599	0.120	55.0	0.041	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.000	6.187	0.041	150.9	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	2.253	0.271	8.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	8.803	0.325	27.1	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)
4.001	50.00	5.37	35.251	0.029	0.0	0.0	0.0	1.01	17.8	3.9
5.000	50.00	5.02	35.545	0.000	0.0	0.0	0.0	2.75	21.6	0.0
1.008	50.00	6.28	34.966	0.210	0.0	0.0	0.0	2.12	150.2	28.4
6.000	50.00	5.13	35.037	0.000	0.0	0.0	0.0	0.82	14.4	0.0
1.009	50.00	6.28	34.846	0.210	0.0	0.0	0.0	5.48	387.7	28.4
1.010	50.00	6.34	34.650	0.210	0.0	0.0	0.0	2.52	100.4	28.4

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Invert Level (m)	Diameter (mm)	Pipes In PN	Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	36.522	1.007	Open Manhole	450	1.000	35.515	225				
2	36.522	1.030	Open Manhole	450	1.001	35.492	225	1.000	35.492	225	
3	36.522	1.082	Open Manhole	450	1.002	35.440	225	1.001	35.440	225	
4	36.522	1.117	Open Manhole	450	1.003	35.405	225	1.002	35.405	225	
5	36.522	1.143	Open Manhole	1200	1.004	35.379	225	1.003	35.379	225	
6	36.522	1.257	Open Manhole	1200	1.005	35.265	300	1.004	35.340	225	
7	36.522	0.922	Open Manhole	450	2.000	35.600	150				
8	36.522	0.988	Open Manhole	450	2.001	35.534	150	2.000	35.534	150	
9	36.522	1.092	Open Manhole	450	2.002	35.430	150	2.001	35.430	150	
10	36.522	1.278	Open Manhole	1200	1.006	35.244	300	1.005	35.244	300	1
								2.002	35.394	150	
11	36.522	1.022	Open Manhole	450	3.000	35.500	100				
12	36.522	1.375	Open Manhole	1200	1.007	35.147	300	1.006	35.147	300	
								3.000	35.347	100	
13	36.522	1.182	Open Manhole	450	4.000	35.340	150				
14	36.522	1.271	Open Manhole	450	4.001	35.251	150	4.000	35.251	150	
15	36.522	0.977	Open Manhole	450	5.000	35.545	100				
16	36.522	1.556	Open Manhole	1200	1.008	34.966	300	1.007	34.966	300	
								4.001	35.116	150	
								5.000	35.166	100	
17	36.522	1.485	Junction	0	6.000	35.037	150				
18	36.522	1.676	Open Manhole	1200	1.009	34.846	300	1.008	34.846	300	
								6.000	34.996	150	
CWMH	36.522	1.947	Open Manhole	1200	1.010	34.650	225	1.009	34.575	300	
	36.575	2.250	Open Manhole	0		OUTFALL		1.010	34.325	225	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	36.522	35.515	0.782	Open Manhole	450
1.001	o	225	2	36.522	35.492	0.805	Open Manhole	450
1.002	o	225	3	36.522	35.440	0.857	Open Manhole	450
1.003	o	225	4	36.522	35.405	0.892	Open Manhole	450
1.004	o	225	5	36.522	35.379	0.918	Open Manhole	1200
1.005	o	300	6	36.522	35.265	0.957	Open Manhole	1200
2.000	o	150	7	36.522	35.600	0.772	Open Manhole	450
2.001	o	150	8	36.522	35.534	0.838	Open Manhole	450
2.002	o	150	9	36.522	35.430	0.942	Open Manhole	450
1.006	o	300	10	36.522	35.244	0.978	Open Manhole	1200
3.000	o	100	11	36.522	35.500	0.922	Open Manhole	450
1.007	o	300	12	36.522	35.147	1.075	Open Manhole	1200
4.000	o	150	13	36.522	35.340	1.032	Open Manhole	450
4.001	o	150	14	36.522	35.251	1.121	Open Manhole	450
5.000	o	100	15	36.522	35.545	0.877	Open Manhole	450
1.008	o	300	16	36.522	34.966	1.256	Open Manhole	1200
6.000	o	150	17	36.522	35.037	1.335	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)
1.000	5.253	225.0	2	36.522	35.492	0.805	Open Manhole	450
1.001	11.533	225.0	3	36.522	35.440	0.857	Open Manhole	450
1.002	7.870	225.0	4	36.522	35.405	0.892	Open Manhole	450
1.003	5.866	225.0	5	36.522	35.379	0.918	Open Manhole	1200
1.004	8.868	225.0	6	36.522	35.340	0.957	Open Manhole	1200
1.005	4.637	225.0	10	36.522	35.244	0.978	Open Manhole	1200
2.000	6.592	100.0	8	36.522	35.534	0.838	Open Manhole	450
2.001	10.437	100.0	9	36.522	35.430	0.942	Open Manhole	450
2.002	3.508	97.4	10	36.522	35.394	0.978	Open Manhole	1200
1.006	21.796	225.0	12	36.522	35.147	1.075	Open Manhole	1200
3.000	2.401	15.7	12	36.522	35.347	1.075	Open Manhole	1200
1.007	7.089	39.2	16	36.522	34.966	1.256	Open Manhole	1200
4.000	8.867	99.6	14	36.522	35.251	1.121	Open Manhole	450
4.001	13.469	99.4	16	36.522	35.116	1.256	Open Manhole	1200
5.000	3.035	8.0	16	36.522	35.166	1.256	Open Manhole	1200
1.008	6.599	55.0	18	36.522	34.846	1.376	Open Manhole	1200
6.000	6.187	150.9	18	36.522	34.996	1.376	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	o	300	18	36.522	34.846	1.376	Open Manhole	1200
1.010	o	225	CWMH	36.522	34.650	1.647	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)
1.009	2.253	8.3	CWMH	36.522	34.575	1.647	Open Manhole	1200
1.010	8.803	27.1		36.575	34.325	2.025	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	0.014	0.014	0.014
1.001	User	-	100	0.014	0.014	0.014
1.002	User	-	100	0.010	0.010	0.010
1.003	User	-	100	0.001	0.001	0.001
1.004	User	-	100	0.017	0.017	0.017
1.005	User	-	100	0.012	0.012	0.012
2.000	User	-	100	0.029	0.029	0.029
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
1.006	User	-	100	0.025	0.025	0.025
3.000	-	-	100	0.000	0.000	0.000
1.007	User	-	100	0.007	0.007	0.007
	User	-	100	0.011	0.011	0.017
4.000	User	-	100	0.029	0.029	0.029
4.001	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
1.008	User	-	100	0.010	0.010	0.010
	User	-	100	0.032	0.032	0.041
6.000	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.210	0.210	0.210

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010		36.575	34.325	34.525	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 * 10m ³ /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 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)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.800	Storm Duration (mins)	30
Ratio R	0.441		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 18, DS/PN: 1.009, Volume (m³): 2.4

Unit Reference	MD-SHE-0163-1330-1200-1330
Design Head (m)	1.200
Design Flow (l/s)	13.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	163
Invert Level (m)	34.846
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	13.3	Kick-Flo®	0.801	11.0
Flush-Flo™	0.364	13.3	Mean Flow over Head Range	-	11.5

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.8	0.800	11.0	2.000	16.9	4.000	23.6	7.000	30.9
0.200	12.5	1.000	12.2	2.200	17.7	4.500	25.0	7.500	31.9
0.300	13.2	1.200	13.3	2.400	18.5	5.000	26.3	8.000	32.9
0.400	13.3	1.400	14.3	2.600	19.2	5.500	27.5	8.500	33.9
0.500	13.1	1.600	15.2	3.000	20.6	6.000	28.7	9.000	34.9
0.600	12.8	1.800	16.1	3.500	22.1	6.500	29.8	9.500	35.8

Greenwood Place



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Tank or Pond Manhole: 17, DS/PN: 6.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	80.0	0.400	80.0	0.401	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 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) 20.800 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.441 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) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

									Water	Surcharged	Flooded	
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.
1.000	1	15 Winter	1	+0%	30/15 Winter				35.561	-0.179	0.000	0.08
1.001	2	15 Winter	1	+0%	30/15 Summer				35.546	-0.171	0.000	0.13
1.002	3	15 Winter	1	+0%	30/15 Summer				35.507	-0.159	0.000	0.19
1.003	4	15 Winter	1	+0%	30/15 Summer				35.476	-0.155	0.000	0.20
1.004	5	15 Winter	1	+0%	30/15 Summer				35.458	-0.147	0.000	0.26
1.005	6	15 Winter	1	+0%	30/15 Summer				35.358	-0.207	0.000	0.18
2.000	7	15 Winter	1	+0%	30/15 Winter				35.655	-0.095	0.000	0.29
2.001	8	15 Winter	1	+0%	30/15 Summer				35.588	-0.096	0.000	0.27
2.002	9	15 Winter	1	+0%	30/15 Summer				35.493	-0.086	0.000	0.37
1.006	10	15 Winter	1	+0%	30/15 Summer				35.345	-0.199	0.000	0.25
3.000	11	60 Winter	1	+0%	30/15 Summer				35.500	-0.100	0.000	0.00
1.007	12	15 Winter	1	+0%	30/15 Summer				35.261	-0.186	0.000	0.17
4.000	13	15 Winter	1	+0%	30/15 Summer				35.394	-0.096	0.000	0.28
4.001	14	15 Winter	1	+0%	30/15 Summer				35.304	-0.097	0.000	0.26
5.000	15	60 Winter	1	+0%	30/15 Winter				35.545	-0.100	0.000	0.00
1.008	16	15 Winter	1	+0%	30/15 Summer				35.252	-0.013	0.000	0.30
6.000	17	15 Winter	1	+0%	30/15 Summer				35.081	-0.106	0.000	0.18
1.009	18	15 Winter	1	+0%	1/15 Summer				35.240	0.094	0.000	0.10
1.010	CWMH	60 Summer	1	+0%					34.711	-0.164	0.000	0.16

		Pipe			
PN	US/MH Name	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded
1.000	1		2.1	OK	
1.001	2		3.8	OK	
1.002	3		5.2	OK	
1.003	4		5.3	OK	
1.004	5		7.4	OK	
1.005	6		8.8	OK	
2.000	7		4.4	OK	
2.001	8		4.3	OK	

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

		Pipe			
PN	US/MH Name	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded
2.002	9		4.4	OK	
1.006	10		16.1	OK	
3.000	11		0.0	OK	
1.007	12		17.7	OK	
4.000	13		4.3	OK	
4.001	14		4.3	OK	
5.000	15		0.0	OK	
1.008	16		26.0	OK	
6.000	17		2.2	OK*	
1.009	18		13.3	SURCHARGED	
1.010	CWMH		13.3	OK	

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File gw.mdx	Checked by MB	
XP Solutions	Network 2016.1.1	

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 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) 20.800 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.441 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) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

									Water	Surcharged	Flooded	
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.
1.000	1	15 Winter	30	+0%	30/15 Winter				35.774	0.034	0.000	0.19
1.001	2	15 Winter	30	+0%	30/15 Summer				35.770	0.054	0.000	0.33
1.002	3	15 Winter	30	+0%	30/15 Summer				35.759	0.094	0.000	0.47
1.003	4	15 Winter	30	+0%	30/15 Summer				35.749	0.118	0.000	0.47
1.004	5	15 Winter	30	+0%	30/15 Summer				35.740	0.136	0.000	0.62
1.005	6	15 Winter	30	+0%	30/15 Summer				35.723	0.158	0.000	0.36
2.000	7	15 Winter	30	+0%	30/15 Winter				35.781	0.031	0.000	0.70
2.001	8	15 Winter	30	+0%	30/15 Summer				35.760	0.076	0.000	0.62
2.002	9	15 Winter	30	+0%	30/15 Summer				35.730	0.150	0.000	0.76
1.006	10	15 Winter	30	+0%	30/15 Summer				35.716	0.173	0.000	0.48
3.000	11	15 Winter	30	+0%	30/15 Summer				35.683	0.083	0.000	0.02
1.007	12	15 Winter	30	+0%	30/15 Summer				35.683	0.236	0.000	0.33
4.000	13	15 Winter	30	+0%	30/15 Summer				35.731	0.241	0.000	0.61
4.001	14	15 Winter	30	+0%	30/15 Summer				35.700	0.299	0.000	0.57
5.000	15	15 Winter	30	+0%	30/15 Winter				35.665	0.020	0.000	0.01
1.008	16	15 Winter	30	+0%	30/15 Summer				35.665	0.399	0.000	0.62
6.000	17	30 Winter	30	+0%	30/15 Summer				35.319	0.132	0.000	0.96
1.009	18	15 Winter	30	+0%	1/15 Summer				35.634	0.489	0.000	0.10
1.010	CWMH	60 Summer	30	+0%					34.711	-0.164	0.000	0.16

		Pipe		Level	
PN	US/MH Name	Overflow (l/s)	Flow (l/s)	Status	Exceeded
1.000	1		4.7	SURCHARGED	
1.001	2		9.8	SURCHARGED	
1.002	3		12.9	SURCHARGED	
1.003	4		12.3	SURCHARGED	
1.004	5		17.5	SURCHARGED	
1.005	6		17.4	SURCHARGED	
2.000	7		10.5	SURCHARGED	
2.001	8		9.8	SURCHARGED	

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

PN	US/MH Name	Overflow (l/s)	Pipe	Status	Level
			Flow (l/s)		Exceeded
2.002	9		9.0	SURCHARGED	
1.006	10		31.3	SURCHARGED	
3.000	11		0.2	SURCHARGED	
1.007	12		35.6	SURCHARGED	
4.000	13		9.5	SURCHARGED	
4.001	14		9.3	SURCHARGED	
5.000	15		0.2	SURCHARGED	
1.008	16		53.6	SURCHARGED	
6.000	17		12.2	SURCHARGED*	
1.009	18		13.3	SURCHARGED	
1.010	CWMH		13.3		OK

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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 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) 20.800 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.441 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) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume	Flow / Cap.
	Name	Storm							(m)	(m)	(m³)	
1.000	1	15 Winter	100	+20%	30/15 Winter				36.475	0.735	0.000	0.24
1.001	2	15 Winter	100	+20%	30/15 Summer				36.470	0.753	0.000	0.41
1.002	3	15 Winter	100	+20%	30/15 Summer				36.453	0.788	0.000	0.60
1.003	4	15 Winter	100	+20%	30/15 Summer				36.437	0.807	0.000	0.63
1.004	5	15 Winter	100	+20%	30/15 Summer				36.425	0.820	0.000	0.75
1.005	6	15 Winter	100	+20%	30/15 Summer				36.400	0.835	0.000	0.51
2.000	7	15 Winter	100	+20%	30/15 Winter				36.520	0.770	0.000	0.86
2.001	8	15 Winter	100	+20%	30/15 Summer				36.483	0.799	0.000	0.79
2.002	9	15 Winter	100	+20%	30/15 Summer				36.427	0.848	0.000	1.05
1.006	10	15 Winter	100	+20%	30/15 Summer				36.392	0.848	0.000	0.69
3.000	11	15 Winter	100	+20%	30/15 Summer				36.343	0.743	0.000	0.04
1.007	12	15 Winter	100	+20%	30/15 Summer				36.344	0.897	0.000	0.47
4.000	13	15 Winter	100	+20%	30/15 Summer				36.452	0.962	0.000	0.87
4.001	14	15 Winter	100	+20%	30/15 Summer				36.395	0.994	0.000	0.80
5.000	15	15 Winter	100	+20%	30/15 Winter				36.315	0.670	0.000	0.02
1.008	16	15 Winter	100	+20%	30/15 Summer				36.317	1.051	0.000	0.88
6.000	17	30 Winter	100	+20%	30/15 Summer				35.438	0.251	0.000	0.84
1.009	18	15 Winter	100	+20%	1/15 Summer				36.222	1.077	0.000	0.11
1.010	CWMH	15 Winter	100	+20%					34.713	-0.162	0.000	0.18

PN	Pipe		Status	Level Exceeded
	US/MH Name	Overflow Flow (l/s)		
1.000	1	6.2	FLOOD RISK	
1.001	2	12.1	FLOOD RISK	
1.002	3	16.7	FLOOD RISK	
1.003	4	16.5	FLOOD RISK	
1.004	5	21.1	FLOOD RISK	
1.005	6	24.2	FLOOD RISK	
2.000	7	12.9	FLOOD RISK	
2.001	8	12.5	FLOOD RISK	

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

		Pipe			
	US/MH	Overflow	Flow		Level
PN	Name	(l/s)	(l/s)	Status	Exceeded
2.002	9		12.4	FLOOD RISK	
1.006	10		44.6	FLOOD RISK	
3.000	11		0.4	FLOOD RISK	
1.007	12		50.1	FLOOD RISK	
4.000	13		13.6	FLOOD RISK	
4.001	14		13.1	FLOOD RISK	
5.000	15		0.4	FLOOD RISK	
1.008	16		76.6	FLOOD RISK	
6.000	17		10.7	SURCHARGED*	
1.009	18		14.1	FLOOD RISK	
1.010	CWMH		14.1		OK