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Richmond House Chester Bus. Park CH4 9QZ	Maple Cross Network Design Revision C - P17	
Date 25/02/2021 12:49 File revised layout 27.01.21...	Designed by JH Checked by	
Innovyze	Network 2020.1.3	

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)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.407	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 Soffits

Time Area Diagram for Storm




Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.905	4-8	0.678

Total Area Contributing (ha) = 2.583

Total Pipe Volume (m³) = 52.930


Network Design Table for Storm

« - 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)	Section Type	Auto Design
1.000	76.315	0.317	240.7	0.050	4.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	12.554	0.052	241.4	0.136	4.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	48.570	0.201	241.6	0.220	0.00	0.0	0.600	o	300	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)
1.000	50.00	5.26	41.300	0.050	0.0	0.0	0.0	1.01	71.3	6.8
2.000	50.00	4.21	41.000	0.136	0.0	0.0	0.0	1.01	71.2	18.4
1.001	50.00	6.06	40.948	0.406	0.0	0.0	0.0	1.01	71.2	55.0


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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.002	75.765	0.389	194.8	0.100	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	32.569	0.970	33.6	0.144	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.000	30.951	0.184	168.2	0.247	4.00	0.0	0.600	o	375	Pipe/Conduit	
3.001	25.151	0.150	167.7	0.100	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.002	21.474	0.278	77.2	0.100	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	16.000	0.040	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	42.191	0.170	248.2	0.200	4.00	0.0	0.600	o	450	Pipe/Conduit	
4.001	40.550	0.164	248.0	0.297	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.002	6.159	0.025	248.0	0.297	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	38.457	0.155	248.1	0.200	4.00	0.0	0.600	o	375	Pipe/Conduit	
5.001	38.347	0.155	248.0	0.246	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.002	3.983	0.016	248.9	0.246	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table


PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.002	50.00	7.19	40.747	0.506	0.0	0.0	0.0	1.12	79.4	68.5
1.003	50.00	7.36	40.358	0.650	0.0	0.0	0.0	3.14	346.4	88.0
3.000	50.00	4.37	40.000	0.247	0.0	0.0	0.0	1.39	154.0	33.4
3.001	50.00	4.67	39.816	0.347	0.0	0.0	0.0	1.40	154.2	47.0
3.002	50.00	4.84	39.666	0.447	0.0	0.0	0.0	2.06	227.9	60.5
1.004	50.00	7.63	39.313	1.097	0.0	0.0	0.0	1.01	160.7	148.5
4.000	50.00	4.55	41.000	0.200	0.0	0.0	0.0	1.29	204.5	27.1
4.001	50.00	5.07	40.830	0.497	0.0	0.0	0.0	1.29	204.6	67.3
4.002	50.00	5.15	40.666	0.794	0.0	0.0	0.0	1.29	204.6	107.5
5.000	50.00	4.56	41.000	0.200	0.0	0.0	0.0	1.15	126.5	27.1
5.001	50.00	5.12	40.845	0.446	0.0	0.0	0.0	1.15	126.6	60.4
5.002	50.00	5.18	40.690	0.692	0.0	0.0	0.0	1.14	126.3	93.7
1.005	50.00	7.71	39.273	2.583	0.0	0.0	0.0	1.00	17.8	349.8

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	42.675	1.375	Open Manhole	1500	1.000	41.300	300				
2	42.650	1.650	Open Manhole	1500	2.000	41.000	300				
3	42.730	1.782	Open Manhole	1500	1.001	40.948	300	1.000	40.983	300	35
								2.000	40.948	300	
4	42.850	2.103	Open Manhole	1200	1.002	40.747	300	1.001	40.747	300	
5	42.650	2.292	Open Manhole	1350	1.003	40.358	375	1.002	40.358	300	
6	42.215	2.215	Open Manhole	1500	3.000	40.000	375				
7	42.340	2.524	Open Manhole	1500	3.001	39.816	375	3.000	39.816	375	
8	42.340	2.674	Open Manhole	1500	3.002	39.666	375	3.001	39.666	375	
9	42.340	3.027	Open Manhole	1500	1.004	39.313	450	1.003	39.388	375	
								3.002	39.388	375	
10	43.090	2.090	Open Manhole	1500	4.000	41.000	450				
11	43.090	2.260	Open Manhole	1500	4.001	40.830	450	4.000	40.830	450	
12	42.360	1.694	Open Manhole	1500	4.002	40.666	450	4.001	40.666	450	
13	43.190	2.190	Open Manhole	1500	5.000	41.000	375				
14	43.190	2.345	Open Manhole	1500	5.001	40.845	375	5.000	40.845	375	
15	43.190	2.500	Open Manhole	1500	5.002	40.690	375	5.001	40.690	375	
16	42.730	3.457	Open Manhole	2100	1.005	39.273	150	1.004	39.273	450	
								4.002	40.642	450	1669
								5.002	40.674	375	1626
	42.650	3.427	Open Manhole	0		OUTFALL		1.005	39.223	150	

No coordinates have been specified, layout information cannot be produced.

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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	300	1	42.675	41.300	1.075	Open Manhole	1500
2.000	o	300	2	42.650	41.000	1.350	Open Manhole	1500
1.001	o	300	3	42.730	40.948	1.482	Open Manhole	1500
1.002	o	300	4	42.850	40.747	1.803	Open Manhole	1200
1.003	o	375	5	42.650	40.358	1.917	Open Manhole	1350
3.000	o	375	6	42.215	40.000	1.840	Open Manhole	1500
3.001	o	375	7	42.340	39.816	2.149	Open Manhole	1500
3.002	o	375	8	42.340	39.666	2.299	Open Manhole	1500
1.004	o	450	9	42.340	39.313	2.577	Open Manhole	1500
4.000	o	450	10	43.090	41.000	1.640	Open Manhole	1500
4.001	o	450	11	43.090	40.830	1.810	Open Manhole	1500
4.002	o	450	12	42.360	40.666	1.244	Open Manhole	1500
5.000	o	375	13	43.190	41.000	1.815	Open Manhole	1500
5.001	o	375	14	43.190	40.845	1.970	Open Manhole	1500
5.002	o	375	15	43.190	40.690	2.125	Open Manhole	1500

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	76.315	240.7	3	42.730	40.983	1.447	Open Manhole	1500
2.000	12.554	241.4	3	42.730	40.948	1.482	Open Manhole	1500
1.001	48.570	241.6	4	42.850	40.747	1.803	Open Manhole	1200
1.002	75.765	194.8	5	42.650	40.358	1.992	Open Manhole	1350
1.003	32.569	33.6	9	42.340	39.388	2.577	Open Manhole	1500
3.000	30.951	168.2	7	42.340	39.816	2.149	Open Manhole	1500
3.001	25.151	167.7	8	42.340	39.666	2.299	Open Manhole	1500
3.002	21.474	77.2	9	42.340	39.388	2.577	Open Manhole	1500
1.004	16.000	400.0	16	42.730	39.273	3.007	Open Manhole	2100
4.000	42.191	248.2	11	43.090	40.830	1.810	Open Manhole	1500
4.001	40.550	248.0	12	42.360	40.666	1.244	Open Manhole	1500
4.002	6.159	248.0	16	42.730	40.642	1.638	Open Manhole	2100
5.000	38.457	248.1	14	43.190	40.845	1.970	Open Manhole	1500
5.001	38.347	248.0	15	43.190	40.690	2.125	Open Manhole	1500
5.002	3.983	248.9	16	42.730	40.674	1.681	Open Manhole	2100

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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)
1.005	o	150	16	42.730	39.273	3.307	Open Manhole	2100

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)
1.005	5.000	100.0		42.650	39.223	3.277	Open Manhole	0

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)
1.005		42.650	39.223	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 * 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 Storage Structures	4
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.407		


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Online Controls for Storm

Pump Manhole: 16, DS/PN: 1.005, Volume (m³): 15.2

Invert Level (m) 39.273

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.5000	0.900	6.5000	1.700	6.5000	2.500	6.5000
0.200	6.5000	1.000	6.5000	1.800	6.5000	2.600	6.5000
0.300	6.5000	1.100	6.5000	1.900	6.5000	2.700	6.5000
0.400	6.5000	1.200	6.5000	2.000	6.5000	2.800	6.5000
0.500	6.5000	1.300	6.5000	2.100	6.5000	2.900	6.5000
0.600	6.5000	1.400	6.5000	2.200	6.5000	3.000	6.5000
0.700	6.5000	1.500	6.5000	2.300	6.5000		
0.800	6.5000	1.600	6.5000	2.400	6.5000		

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Storage Structures for Storm

Cellular Storage Manhole: 2, DS/PN: 2.000

Invert Level (m) 41.000 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	32.0	32.0	1.001	0.0	54.6
1.000	32.0	54.6			

Porous Car Park Manhole: 4, DS/PN: 1.002

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 64.0
 Membrane Percolation (mm/hr) 1000 Length (m) 10.0
 Max Percolation (l/s) 177.8 Slope (1:X) 0.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 42.300 Membrane Depth (mm) 250


Porous Car Park Manhole: 12, DS/PN: 4.002

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 15.5
 Membrane Percolation (mm/hr) 1000 Length (m) 86.8
 Max Percolation (l/s) 373.7 Slope (1:X) 0.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 41.800 Membrane Depth (mm) 250

Cellular Storage Manhole: 16, DS/PN: 1.005

Invert Level (m) 39.531 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1350.0	1350.0	1.601	0.0	1585.2
1.600	1350.0	1585.2			

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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 Storage Structures 4
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 0.407
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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) 1, 30, 100
Climate Change (%) 0, 0, 30


WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%	100/15 Summer				41.366
2.000	2	15 Winter	1	+0%	30/15 Summer				41.138
1.001	3	15 Winter	1	+0%	30/15 Summer				41.126
1.002	4	15 Winter	1	+0%	30/15 Summer				40.931
1.003	5	15 Winter	1	+0%	100/360 Winter				40.472
3.000	6	15 Winter	1	+0%	100/15 Summer				40.132
3.001	7	15 Winter	1	+0%	30/15 Summer				39.973
3.002	8	15 Winter	1	+0%	30/15 Summer				39.810
1.004	9	360 Winter	1	+0%	1/180 Winter				39.781
4.000	10	15 Winter	1	+0%	30/15 Summer				41.121
4.001	11	15 Winter	1	+0%	30/15 Summer				41.027
4.002	12	15 Winter	1	+0%	30/15 Summer				40.958
5.000	13	15 Winter	1	+0%	30/15 Summer				41.130
5.001	14	15 Winter	1	+0%	30/15 Summer				41.052

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


PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)						
1.000	1	-0.234	0.000	0.10			6.9	OK	
2.000	2	-0.162	0.000	0.24		8	13.7	OK	
1.001	3	-0.122	0.000	0.63			42.5	OK	
1.002	4	-0.116	0.000	0.65		6	49.5	OK	
1.003	5	-0.261	0.000	0.20			61.3	OK	
3.000	6	-0.243	0.000	0.27			36.8	OK	
3.001	7	-0.218	0.000	0.36			48.0	OK	
3.002	8	-0.231	0.000	0.31			60.1	OK	
1.004	9	0.018	0.000	0.20			22.8	SURCHARGED	
4.000	10	-0.329	0.000	0.16			29.3	OK	
4.001	11	-0.253	0.000	0.33			60.7	OK	
4.002	12	-0.158	0.000	0.74		6	92.2	OK	
5.000	13	-0.245	0.000	0.26			29.3	OK	
5.001	14	-0.168	0.000	0.48			54.6	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.002	15	15 Winter	1	+0%	30/15 Summer				40.999
1.005	16	360 Winter	1	+0%	1/15 Summer				39.780

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.002	15	-0.067	0.000	1.00		79.9	OK	
1.005	16	0.357	0.000	0.46		6.5	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet 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 4
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 0.407
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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) 1, 30, 100
Climate Change (%) 0, 0, 30


WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	30	+0%	100/15 Summer				41.493
2.000	2	15 Winter	30	+0%	30/15 Summer				41.503
1.001	3	15 Winter	30	+0%	30/15 Summer				41.476
1.002	4	15 Winter	30	+0%	30/15 Summer				41.255
1.003	5	15 Winter	30	+0%	100/360 Winter				40.530
3.000	6	15 Winter	30	+0%	100/15 Summer				40.274
3.001	7	720 Winter	30	+0%	30/15 Summer				40.240
3.002	8	720 Winter	30	+0%	30/15 Summer				40.239
1.004	9	720 Winter	30	+0%	1/180 Winter				40.238
4.000	10	15 Winter	30	+0%	30/15 Summer				41.539
4.001	11	15 Winter	30	+0%	30/15 Summer				41.438
4.002	12	15 Winter	30	+0%	30/15 Summer				41.296
5.000	13	15 Winter	30	+0%	30/15 Summer				41.739
5.001	14	15 Winter	30	+0%	30/15 Summer				41.648

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


PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.107	0.000	0.24		16.2	OK	
2.000	2	0.203	0.000	0.63		8 36.3	SURCHARGED	
1.001	3	0.228	0.000	1.11		74.2	SURCHARGED	
1.002	4	0.208	0.000	1.20		8 91.4	SURCHARGED	
1.003	5	-0.203	0.000	0.42		128.9	OK	
3.000	6	-0.101	0.000	0.65		88.4	OK	
3.001	7	0.049	0.000	0.07		9.4	SURCHARGED	
3.002	8	0.198	0.000	0.06		11.7	SURCHARGED	
1.004	9	0.475	0.000	0.26		29.0	SURCHARGED	
4.000	10	0.089	0.000	0.36		65.8	SURCHARGED	
4.001	11	0.158	0.000	0.89		162.7	SURCHARGED	
4.002	12	0.179	0.000	2.09		7 258.8	SURCHARGED	
5.000	13	0.364	0.000	0.57		65.6	SURCHARGED	
5.001	14	0.428	0.000	1.27		145.2	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.002	15	15 Winter	30	+0%	30/15 Summer				41.380
1.005	16	720 Winter	30	+0%	1/15 Summer				40.237

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.002	15	0.315	0.000	2.82		225.1	SURCHARGED	
1.005	16	0.814	0.000	0.46		6.5	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet 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 4
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 0.407
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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) 1, 30, 100
Climate Change (%) 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 (m)
1.000	1	15 Winter	100	+30%	100/15 Summer				42.622
2.000	2	15 Winter	100	+30%	30/15 Summer				42.635
1.001	3	15 Winter	100	+30%	30/15 Summer				42.604
1.002	4	15 Winter	100	+30%	30/15 Summer				41.960
1.003	5	960 Winter	100	+30%	100/360 Winter				40.873
3.000	6	15 Winter	100	+30%	100/15 Summer				41.199
3.001	7	15 Winter	100	+30%	30/15 Summer				41.013
3.002	8	960 Winter	100	+30%	30/15 Summer				40.873
1.004	9	960 Winter	100	+30%	1/180 Winter				40.872
4.000	10	15 Winter	100	+30%	30/15 Summer				42.234
4.001	11	15 Winter	100	+30%	30/15 Summer				42.132
4.002	12	15 Winter	100	+30%	30/15 Summer				41.724
5.000	13	15 Winter	100	+30%	30/15 Summer				42.782
5.001	14	15 Winter	100	+30%	30/15 Summer				42.641
5.002	15	15 Winter	100	+30%	30/15 Summer				41.952
1.005	16	960 Winter	100	+30%	1/15 Summer				40.871

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

PN	US/MH Name	Surcharged Flooded		Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	1	1.022	0.000	0.28		19.4	FLOOD RISK	
2.000	2	1.335	0.000	0.86	11	50.0	FLOOD RISK	
1.001	3	1.356	0.000	1.70		113.8	FLOOD RISK	
1.002	4	0.913	0.000	1.78	11	136.1	SURCHARGED	
1.003	5	0.140	0.000	0.08		23.6	SURCHARGED	
3.000	6	0.824	0.000	0.98		134.2	SURCHARGED	
3.001	7	0.822	0.000	1.40		186.7	SURCHARGED	
3.002	8	0.832	0.000	0.08		16.0	SURCHARGED	
1.004	9	1.109	0.000	0.35		39.0	SURCHARGED	
4.000	10	0.784	0.000	0.62		112.6	SURCHARGED	
4.001	11	0.852	0.000	1.53		278.7	SURCHARGED	
4.002	12	0.607	0.000	3.59	8	444.3	SURCHARGED	
5.000	13	1.407	0.000	0.94		107.6	SURCHARGED	
5.001	14	1.421	0.000	2.06		235.8	SURCHARGED	
5.002	15	0.886	0.000	4.62		369.0	SURCHARGED	
1.005	16	1.448	0.000	0.46	2280	6.5	SURCHARGED	