


Barnsley Marshall		Page 1
1 Birch Court Blackpole East Worcester, WR3 8SG		
Date 15/08/2023 15:49	Designed by AlexMavhunga	
File 700m3 Pond @ 5.0 lps - R...	Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Alex003

FSR Rainfall Model - England and Wales

Return Period (years)	3	PIMP (%)	100
M5-60 (mm)	18.500	Add Flow / Climate Change (%)	40
Ratio R	0.334	Minimum Backdrop Height (m)	4.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	4.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.500
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

Time Area Diagram for Storm




Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.000	8-12	0.514	12-16	0.408

Total Area Contributing (ha) = 0.921

Total Pipe Volume (m³) = 43.434

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
S1.000	51.808	0.310	167.1	0.082	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	53.261	0.318	167.5	0.065	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	18.299	0.109	167.9	0.054	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)
S1.000	50.00	5.71	107.200	0.082	0.0	0.0	4.4	1.21	85.8	15.5
S1.001	50.00	6.44	106.890	0.147	0.0	0.0	8.0	1.21	85.7	27.9
S1.002	50.00	6.70	106.572	0.201	0.0	0.0	10.9	1.21	85.6	38.0

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
S2.000	51.694	0.309	167.3	0.107	5.00	0.0	0.600	o	300	Pipe/Conduit		
S2.001	53.305	0.429	124.3	0.097	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.003	18.300	0.057	321.0	0.043	0.00	0.0	0.600	o	375	Pipe/Conduit		
S3.000	51.810	0.310	167.1	0.068	5.00	0.0	0.600	o	300	Pipe/Conduit		
S3.001	53.421	0.485	110.1	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.004	20.574	0.430	47.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		
S4.000	90.127	0.857	105.2	0.163	5.00	0.0	0.600	o	300	Pipe/Conduit		
S4.001	36.903	0.351	105.2	0.155	0.00	0.0	0.600	o	300	Pipe/Conduit		
S4.002	20.280	0.192	105.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.005	16.057	0.161	100.0	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit		
S1.006	26.778	0.268	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S1.007	113.978	1.140	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S1.008	18.090	0.181	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S1.009	116.390	0.150	775.9	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)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.000	50.00	5.71	107.200	0.107	0.0	0.0	5.8	1.21	85.7	20.2
S2.001	50.00	6.34	106.891	0.204	0.0	0.0	11.0	1.41	99.6	38.6
S1.003	50.00	7.00	106.387	0.447	0.0	0.0	24.2	1.01	111.1	84.7
S3.000	50.00	5.71	107.200	0.068	0.0	0.0	3.7	1.21	85.8	12.8
S3.001	50.00	6.31	106.890	0.128	0.0	0.0	7.0	1.50	105.9	24.4
S1.004	50.00	7.13	106.330	0.575	0.0	0.0	31.2	2.63	289.9	109.1
S4.000	50.00	5.98	107.300	0.163	0.0	0.0	8.8	1.53	108.3	30.8
S4.001	50.00	6.38	106.443	0.317	0.0	0.0	17.2	1.53	108.3	60.1
S4.002	50.00	6.60	106.092	0.317	0.0	0.0	17.2	1.53	108.1	60.1
S1.005	50.00	7.40	105.900	0.921	0.0	0.0	49.9	1.00	17.8<	174.7
S1.006	50.00	7.84	105.739	0.921	0.0	0.0	49.9	1.00	17.8<	174.7
S1.007	49.81	9.73	105.471	0.921	0.0	0.0	49.9	1.00	17.8<	174.7
S1.008	49.06	10.03	104.331	0.921	0.0	0.0	49.9	1.01	17.8<	174.7
S1.009	38.84	15.52	104.150	0.921	0.0	0.0	49.9	0.35	6.2<	174.7















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)
S01	108.000	0.800	Open Manhole	600	S1.000	107.200	300				
S02	108.000	1.110	Open Manhole	600	S1.001	106.890	300	S1.000	106.890	300	
S03	108.000	1.428	Open Manhole	1200	S1.002	106.572	300	S1.001	106.572	300	
S04	108.000	0.800	Open Manhole	600	S2.000	107.200	300				
S05	108.000	1.109	Open Manhole	600	S2.001	106.891	300	S2.000	106.891	300	
S06	108.000	1.613	Open Manhole	1500	S1.003	106.387	375	S1.002	106.463	300	
								S2.001	106.462	300	1
S07	108.000	0.800	Open Manhole	600	S3.000	107.200	300				
S08	108.000	1.110	Open Manhole	600	S3.001	106.890	300	S3.000	106.890	300	
S09	108.000	1.670	Open Manhole	1500	S1.004	106.330	375	S1.003	106.330	375	
								S3.001	106.405	300	
S15	108.100	0.800	Open Manhole	750	S4.000	107.300	300				
S16	108.000	1.557	Open Manhole	750	S4.001	106.443	300	S4.000	106.443	300	
S17	107.800	1.708	Open Manhole	1200	S4.002	106.092	300	S4.001	106.092	300	
S10	107.800	1.900	Open Manhole	1500	S1.005	105.900	150	S1.004	105.900	375	
								S4.002	105.900	300	
S11	107.700	1.961	Open Manhole	1200	S1.006	105.739	150	S1.005	105.739	150	
S12	107.600	2.129	Open Manhole	450	S1.007	105.471	150	S1.006	105.471	150	
S13	106.000	1.669	Open Manhole	450	S1.008	104.331	150	S1.007	104.331	150	
S14	106.000	1.850	Open Manhole	450	S1.009	104.150	150	S1.008	104.150	150	
SexDitch	105.000	1.000	Open Manhole	0		OUTFALL		S1.009	104.000	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
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S01	360036.501	440289.729	360036.501	440289.729	Required	
S02	360072.874	440326.622	360072.874	440326.622	Required	
S03	360110.315	440364.501	360110.315	440364.501	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S04	360049.533	440276.959	360049.533	440276.959	Required	
S05	360085.878	440313.719	360085.878	440313.719	Required	
S06	360123.337	440351.644	360123.337	440351.644	Required	
S07	360062.487	440264.025	360062.487	440264.025	Required	
S08	360098.876	440300.905	360098.876	440300.905	Required	
S09	360136.449	440338.879	360136.449	440338.879	Required	
S15	360272.768	440254.614	360272.768	440254.614	Required	
S16	360207.386	440316.648	360207.386	440316.648	Required	
S17	360170.555	440318.958	360170.555	440318.958	Required	
S10	360151.001	440324.335	360151.001	440324.335	Required	
S11	360166.812	440327.133	360166.812	440327.133	Required	
S12	360190.915	440338.800	360190.915	440338.800	Required	
S13	360266.740	440423.897	360266.740	440423.897	Required	
S14	360269.279	440441.808	360269.279	440441.808	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SexDitch	360286.336	440556.942			No Entry	




PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S01	108.000	107.200	0.500	Open Manhole	600
S1.001	o	300	S02	108.000	106.890	0.810	Open Manhole	600
S1.002	o	300	S03	108.000	106.572	1.128	Open Manhole	1200
S2.000	o	300	S04	108.000	107.200	0.500	Open Manhole	600
S2.001	o	300	S05	108.000	106.891	0.809	Open Manhole	600
S1.003	o	375	S06	108.000	106.387	1.238	Open Manhole	1500
S3.000	o	300	S07	108.000	107.200	0.500	Open Manhole	600
S3.001	o	300	S08	108.000	106.890	0.810	Open Manhole	600
S1.004	o	375	S09	108.000	106.330	1.295	Open Manhole	1500
S4.000	o	300	S15	108.100	107.300	0.500	Open Manhole	750
S4.001	o	300	S16	108.000	106.443	1.257	Open Manhole	750
S4.002	o	300	S17	107.800	106.092	1.408	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)
S1.000	51.808	167.1	S02	108.000	106.890	0.810	Open Manhole	600
S1.001	53.261	167.5	S03	108.000	106.572	1.128	Open Manhole	1200
S1.002	18.299	167.9	S06	108.000	106.463	1.237	Open Manhole	1500
S2.000	51.694	167.3	S05	108.000	106.891	0.809	Open Manhole	600
S2.001	53.305	124.3	S06	108.000	106.462	1.238	Open Manhole	1500
S1.003	18.300	321.0	S09	108.000	106.330	1.295	Open Manhole	1500
S3.000	51.810	167.1	S08	108.000	106.890	0.810	Open Manhole	600
S3.001	53.421	110.1	S09	108.000	106.405	1.295	Open Manhole	1500
S1.004	20.574	47.8	S10	107.800	105.900	1.525	Open Manhole	1500
S4.000	90.127	105.2	S16	108.000	106.443	1.257	Open Manhole	750
S4.001	36.903	105.2	S17	107.800	106.092	1.408	Open Manhole	1200
S4.002	20.280	105.6	S10	107.800	105.900	1.600	Open Manhole	1500

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.005	o	150	S10	107.800	105.900	1.750	Open Manhole	1500
S1.006	o	150	S11	107.700	105.739	1.811	Open Manhole	1200
S1.007	o	150	S12	107.600	105.471	1.979	Open Manhole	450
S1.008	o	150	S13	106.000	104.331	1.519	Open Manhole	450
S1.009	o	150	S14	106.000	104.150	1.700	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.005	16.057	100.0	S11	107.700	105.739	1.811	Open Manhole	1200
S1.006	26.778	100.0	S12	107.600	105.471	1.979	Open Manhole	450
S1.007	113.978	100.0	S13	106.000	104.331	1.519	Open Manhole	450
S1.008	18.090	99.9	S14	106.000	104.150	1.700	Open Manhole	450
S1.009	116.390	775.9	SexDitch	105.000	104.000	0.850	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.082	0.082	0.082
1.001	User	-	100	0.065	0.065	0.065
1.002	User	-	100	0.054	0.054	0.054
2.000	User	-	100	0.107	0.107	0.107
2.001	User	-	100	0.097	0.097	0.097
1.003	User	-	100	0.043	0.043	0.043
3.000	User	-	100	0.068	0.068	0.068
3.001	User	-	100	0.061	0.061	0.061
1.004	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.163	0.163	0.163
4.001	User	-	100	0.155	0.155	0.155
4.002	-	-	100	0.000	0.000	0.000
1.005	User	-	50	0.058	0.029	0.029
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.950	0.921	0.921

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.009	SexDitch	105.000	104.000	104.000	0	0


Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
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)	1920
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	16

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 Region England and Wales
 Return Period (years) 1000 M5-60 (mm) 18.500

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Synthetic Rainfall Details

Ratio R 0.334 Cv (Winter) 0.840
 Profile Type Winter Storm Duration (mins) 960
 Cv (Summer) 0.750

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Online Controls for Storm


Hydro-Brake® Optimum Manhole: S10, DS/PN: S1.005, Volume (m³): 6.8

Unit Reference	MD-SHE-0097-5000-1600-5000
Design Head (m)	1.600
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	105.900
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)	1.600	5.0	Kick-Flo®	0.865	3.8
Flush-Flo™	0.425	4.7	Mean Flow over Head Range	-	4.2

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	3.1	1.200	4.4	3.000	6.7	7.000	10.0
0.200	4.3	1.400	4.7	3.500	7.2	7.500	10.3
0.300	4.6	1.600	5.0	4.000	7.7	8.000	10.7
0.400	4.7	1.800	5.3	4.500	8.1	8.500	11.0
0.500	4.7	2.000	5.5	5.000	8.5	9.000	11.3
0.600	4.6	2.200	5.8	5.500	8.9	9.500	11.6
0.800	4.1	2.400	6.0	6.000	9.3		
1.000	4.0	2.600	6.3	6.500	9.7		


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Storage Structures for Storm

Tank or Pond Manhole: S10, DS/PN: S1.005

Invert Level (m) 105.900

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	272.9	1.600	626.4	1.900	708.8

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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 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000
Foul Sewage per hectare (1/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 Ratio R 0.279
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.600 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 0.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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 (%) 40, 40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S01	15 Winter	1	+40%					107.281
S1.001	S02	15 Winter	1	+40%	100/15 Summer				106.995
S1.002	S03	15 Winter	1	+40%	30/15 Summer				106.700
S2.000	S04	15 Winter	1	+40%					107.294
S2.001	S05	15 Winter	1	+40%	100/15 Summer				107.007
S1.003	S06	15 Winter	1	+40%	30/15 Summer				106.613
S3.000	S07	15 Winter	1	+40%					107.273
S3.001	S08	15 Winter	1	+40%	100/180 Winter				106.978
S1.004	S09	960 Winter	1	+40%	30/60 Winter				106.494
S4.000	S15	15 Winter	1	+40%	100/15 Summer				107.402
S4.001	S16	15 Winter	1	+40%	30/15 Summer				106.586
S4.002	S17	960 Winter	1	+40%	1/180 Winter				106.494
S1.005	S10	960 Winter	1	+40%	1/15 Summer				106.492
S1.006	S11	120 Summer	1	+40%					105.793
S1.007	S12	2160 Winter	1	+40%					105.523

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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			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
S1.000	S01	-0.219	0.000	0.16		12.8	OK	
S1.001	S02	-0.195	0.000	0.26		20.9	OK	
S1.002	S03	-0.172	0.000	0.38		27.8	OK	
S2.000	S04	-0.206	0.000	0.21		16.6	OK	
S2.001	S05	-0.184	0.000	0.31		29.1	OK	
S1.003	S06	-0.149	0.000	0.67		61.8	OK	
S3.000	S07	-0.227	0.000	0.13		10.6	OK	
S3.001	S08	-0.212	0.000	0.19		18.5	OK	
S1.004	S09	-0.211	0.000	0.04		10.4	OK	
S4.000	S15	-0.198	0.000	0.24		25.0	OK	
S4.001	S16	-0.157	0.000	0.45		45.3	OK	
S4.002	S17	0.102	0.000	0.06		5.5	SURCHARGED	
S1.005	S10	0.442	0.000	0.29		4.7	SURCHARGED	
S1.006	S11	-0.096	0.000	0.28		4.7	OK	
S1.007	S12	-0.098	0.000	0.27		4.7	OK	

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Innovyze	Network 2020.1.3	

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) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.008	S13	2160 Summer	1	+40%					104.385
S1.009	S14	2160 Winter	1	+40%					104.248

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Time (mins)	Flow (l/s)	Status		
S1.008	S13	-0.096	0.000	0.28			4.7	OK		
S1.009	S14	-0.052	0.000	0.76			4.7	OK		

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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 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of 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 Ratio R 0.279
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.600 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 0.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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 (%) 40, 40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S01	15 Winter	30	+40%					107.332
S1.001	S02	960 Winter	30	+40%	100/15 Summer				107.181
S1.002	S03	960 Winter	30	+40%	30/15 Summer				107.179
S2.000	S04	15 Winter	30	+40%					107.354
S2.001	S05	960 Winter	30	+40%	100/15 Summer				107.180
S1.003	S06	960 Winter	30	+40%	30/15 Summer				107.178
S3.000	S07	15 Winter	30	+40%					107.319
S3.001	S08	960 Winter	30	+40%	100/180 Winter				107.178
S1.004	S09	960 Winter	30	+40%	30/60 Winter				107.177
S4.000	S15	15 Winter	30	+40%	100/15 Summer				107.471
S4.001	S16	960 Winter	30	+40%	30/15 Summer				107.179
S4.002	S17	960 Winter	30	+40%	1/180 Winter				107.177
S1.005	S10	960 Winter	30	+40%	1/15 Summer				107.175
S1.006	S11	2880 Winter	30	+40%					105.793
S1.007	S12	5760 Summer	30	+40%					105.523

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


PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
S1.000	S01	-0.168	0.000	0.39		31.2	OK	
S1.001	S02	-0.009	0.000	0.07		5.3	OK	
S1.002	S03	0.307	0.000	0.10		7.0	SURCHARGED	
S2.000	S04	-0.146	0.000	0.50		40.7	OK	
S2.001	S05	-0.011	0.000	0.08		7.4	OK	
S1.003	S06	0.416	0.000	0.16		15.2	SURCHARGED	
S3.000	S07	-0.181	0.000	0.32		25.8	OK	
S3.001	S08	-0.012	0.000	0.05		4.7	OK	
S1.004	S09	0.472	0.000	0.08		19.0	SURCHARGED	
S4.000	S15	-0.129	0.000	0.58		61.1	OK	
S4.001	S16	0.436	0.000	0.11		11.0	SURCHARGED	
S4.002	S17	0.785	0.000	0.12		10.9	SURCHARGED	
S1.005	S10	1.125	0.000	0.29		4.7	SURCHARGED	
S1.006	S11	-0.096	0.000	0.28		4.7	OK	
S1.007	S12	-0.098	0.000	0.27		4.7	OK	

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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) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.008	S13	10080 Winter	30	+40%					104.385
S1.009	S14	8640 Winter	30	+40%					104.248

PN	US/MH Name	Surcharged		Flooded	Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)			
S1.008	S13	-0.096	0.000	0.28		4.7	OK		
S1.009	S14	-0.052	0.000	0.76		4.7	OK		

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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	Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
S1.000	S01	-0.025	0.000	0.05		3.7	OK	
S1.001	S02	0.285	0.000	0.08		6.7	SURCHARGED	
S1.002	S03	0.602	0.000	0.11		8.2	SURCHARGED	
S2.000	S04	-0.024	0.000	0.06		4.9	OK	
S2.001	S05	0.284	0.000	0.10		9.3	SURCHARGED	
S1.003	S06	0.710	0.000	0.20		18.7	SURCHARGED	
S3.000	S07	-0.028	0.000	0.04		3.1	OK	
S3.001	S08	0.282	0.000	0.06		5.9	SURCHARGED	
S1.004	S09	0.766	0.000	0.10		23.9	SURCHARGED	
S4.000	S15	0.120	0.000	0.73		76.5	SURCHARGED	
S4.001	S16	0.731	0.000	0.14		13.9	SURCHARGED	
S4.002	S17	1.079	0.000	0.15		13.8	SURCHARGED	
S1.005	S10	1.419	0.000	0.30		5.0	SURCHARGED	
S1.006	S11	-0.095	0.000	0.29		5.0	OK	
S1.007	S12	-0.096	0.000	0.28		5.0	OK	

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100 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) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.008	S13	960 Winter	100	+40%					104.387
S1.009	S14	960 Winter	100	+40%					104.252

PN	US/MH Name	Surcharged		Flooded		Flow / Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Overflow (l/s)	Cap.					
S1.008	S13	-0.094	0.000	0.30				5.0	OK	
S1.009	S14	-0.048	0.000	0.80				5.0	OK	