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Calculation Document

Project Title: **Hinckley Academy, Leicestershire**

Calculation Title: **Surface Water Calculations**

External Project Number **SPL0001**

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Date: **Jan '23**

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Design Engineer: **Mark Matthewson** Initial: **MM**

Checking Engineer: **David French** Initial: **DF**

Revision	Description	Date Revised	Revised By	Checked By
P01	Draft CP Issue	12.01.23	MM	DF
P02	Draft CP Issue	20.01.23	MM	DF
P03	Document Reference Updated	09.02.23	JS	DF
P04	SW calculations and attenuation details updated	10.03.23	MM	DF
P05	CP Issue	09.08.23	MM	DF

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Design ID Consulting Limited

Directors
Ian Douglas CEng BEng MStructE
Jonathan Macauley CEng BEng MStructE MIEI

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DID-STD Manhole Sizes DID-STD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.133	4-8	0.144

Total Area Contributing (ha) = 0.277

Total Pipe Volume (m³) = 17.926

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
S1.000	30.074	0.301	99.9	0.056	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	16.234	1.623	10.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	8.748	0.875	10.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	6.063	0.205	29.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	18.863	0.102	184.9	0.048	5.00	0.0	0.600	o	300	Pipe/Conduit	
S2.001	24.220	0.108	225.0	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.002	25.600	0.114	225.0	0.003	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.003	18.114	0.098	184.7	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.004	25.741	0.191	134.8	0.000	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	5.38	127.250	0.056	0.0	0.0	0.0	1.31	52.0	7.6
S1.001	50.00	5.45	126.949	0.056	0.0	0.0	0.0	4.16	165.5	7.6
S1.002	50.00	5.48	123.143	0.056	0.0	0.0	0.0	4.16	165.5	7.6
S1.003	50.00	5.53	122.268	0.056	0.0	0.0	0.0	2.41	96.0	7.6
S2.000	50.00	5.27	122.525	0.048	0.0	0.0	0.0	1.15	81.5	6.5
S2.001	50.00	5.66	122.423	0.089	0.0	0.0	0.0	1.04	73.8	12.0
S2.002	50.00	6.07	122.315	0.092	0.0	0.0	0.0	1.04	73.8	12.4
S2.003	50.00	6.33	122.202	0.113	0.0	0.0	0.0	1.15	81.5	15.3
S2.004	50.00	6.65	122.104	0.113	0.0	0.0	0.0	1.35	95.6	15.3

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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
S1.004	2.835	0.118	24.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	12.228	0.054	226.4	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	13.905	0.062	225.0	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	13.936	0.062	225.0	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.005	27.628	0.123	224.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	32.865	0.146	225.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	5.280	0.032	165.0	0.000	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)
S1.004	50.00	6.66	121.913	0.169	0.0	0.0	0.0	3.22	227.7	22.9
S3.000	50.00	5.24	122.300	0.045	0.0	0.0	0.0	0.86	34.4	6.1
S3.001	50.00	5.50	122.246	0.085	0.0	0.0	0.0	0.87	34.5	11.4
S3.002	50.00	5.77	122.184	0.108	0.0	0.0	0.0	0.87	34.5	14.6
S1.005	50.00	7.04	121.720	0.277	0.0	0.0	0.0	1.20	133.1	37.5
S1.006	50.00	7.57	121.597	0.277	0.0	0.0	0.0	1.04	73.8	37.5
S1.007	50.00	7.64	121.451	0.277	0.0	0.0	0.0	1.22	86.3	37.5

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)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	128.400	1.150	Open Manhole	600	S1.000	127.250	225				
S2	128.160	1.211	Open Manhole	600	S1.001	126.949	225	S1.000	126.949	225	2183
S3	126.638	3.495	Open Manhole	600	S1.002	123.143	225	S1.001	125.326	225	
S4	123.618	1.350	Open Manhole	600	S1.003	122.268	225	S1.002	122.268	225	
S5	123.500	0.975	Open Manhole	1200	S2.000	122.525	300				
S6	123.560	1.137	Open Manhole	1200	S2.001	122.423	300	S2.000	122.423	300	
S7	123.491	1.176	Open Manhole	1200	S2.002	122.315	300	S2.001	122.315	300	
S8	123.542	1.340	Open Manhole	1200	S2.003	122.202	300	S2.002	122.202	300	
S9	123.557	1.454	Open Manhole	1200	S2.004	122.104	300	S2.003	122.104	300	
S10	123.527	1.614	Open Manhole	1200	S1.004	121.913	300	S1.003	122.063	225	75
								S2.004	121.913	300	
S11	123.500	1.200	Open Manhole	1200	S3.000	122.300	225				
S12	123.537	1.291	Open Manhole	1200	S3.001	122.246	225	S3.000	122.246	225	253
S13	123.559	1.375	Open Manhole	1200	S3.002	122.184	225	S3.001	122.184	225	
S14	123.532	1.813	Open Manhole	1350	S1.005	121.720	375	S1.004	121.795	300	
								S3.002	122.122	225	
S15	123.600	2.003	Open Manhole	1200	S1.006	121.597	300	S1.005	121.597	375	
S16	123.500	2.049	Open Manhole	1200	S1.007	121.451	300	S1.006	121.451	300	
S101	123.400	1.981	Open Manhole	600		OUTFALL		S1.007	121.419	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	444030.955	294585.799	444030.955	294585.799	Required	
S2	444026.396	294615.525	444026.396	294615.525	Required	
S3	444042.426	294618.091	444042.426	294618.091	Required	
S4	444051.064	294619.469	444051.064	294619.469	Required	
S5	444102.847	294609.222	444102.847	294609.222	Required	
S6	444099.891	294627.852	444099.891	294627.852	Required	
S7	444096.076	294651.769	444096.076	294651.769	Required	
S8	444070.795	294647.736	444070.795	294647.736	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)
S9	444052.904	294644.906	444052.904	294644.906	Required	
S10	444057.127	294619.514	444057.127	294619.514	Required	
S11	444077.847	294596.328	444077.847	294596.328	Required	
S12	444075.903	294608.401	444075.903	294608.401	Required	
S13	444073.693	294622.129	444073.693	294622.129	Required	
S14	444059.931	294619.933	444059.931	294619.933	Required	
S15	444064.284	294592.650	444064.284	294592.650	Required	
S16	444096.779	294597.569	444096.779	294597.569	Required	
S101	444101.772	294599.286			No Entry	

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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	Classification	Soft landscaping	30	0.017	0.005	0.005
	Classification	Hardstanding	75	0.068	0.051	0.056
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
2.000	As Zoned	Default	90	0.054	0.048	0.048
2.001	As Zoned	Default	90	0.032	0.029	0.029
		Hardstanding	75	0.015	0.011	0.040
2.002	As Zoned	Default	90	0.004	0.003	0.003
2.003	As Zoned	Default	90	0.024	0.021	0.021
2.004	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
3.000	As Zoned	Default	90	0.050	0.045	0.045
3.001	As Zoned	Default	90	0.044	0.039	0.039
3.002	As Zoned	Default	90	0.026	0.023	0.023
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.333	0.277	0.277

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)
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S1.007 S101 123.400 121.419 119.400 600 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	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)	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)	19.900	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S15, DS/PN: S1.006, Volume (m³): 5.2

Unit Reference	MD-SHE-0092-4400-1500-4400
Design Head (m)	1.500
Design Flow (l/s)	4.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	92
Invert Level (m)	121.597
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)	1.500	4.4	Kick-Flo®	0.819	3.3
Flush-Flo™	0.401	4.2	Mean Flow over Head Range	-	3.7

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	2.9	0.800	3.4	2.000	5.0	4.000	7.0	7.000	9.1
0.200	3.8	1.000	3.6	2.200	5.3	4.500	7.4	7.500	9.4
0.300	4.1	1.200	4.0	2.400	5.5	5.000	7.7	8.000	9.7
0.400	4.2	1.400	4.3	2.600	5.7	5.500	8.1	8.500	9.9
0.500	4.1	1.600	4.5	3.000	6.1	6.000	8.4	9.000	10.2
0.600	4.0	1.800	4.8	3.500	6.5	6.500	8.8	9.500	10.5

Storage Structures for Storm

Tank or Pond Manhole: S14, DS/PN: S1.005

Invert Level (m) 121.795

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	220.0	1.200	220.0	1.201	0.0

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2 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 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) 19.800 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.400 Cv (Winter) 1.000

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Summer	2	+0%					127.328	-0.147
S1.001	S2	15 Summer	2	+0%					126.994	-0.180
S1.002	S3	15 Summer	2	+0%					123.190	-0.178
S1.003	S4	15 Summer	2	+0%	100/180 Winter				122.336	-0.157
S2.000	S5	15 Summer	2	+0%	100/15 Summer				122.604	-0.221
S2.001	S6	15 Summer	2	+0%	100/15 Summer				122.532	-0.191
S2.002	S7	15 Summer	2	+0%	100/15 Summer				122.424	-0.191
S2.003	S8	15 Summer	2	+0%	100/15 Summer				122.318	-0.184
S2.004	S9	15 Summer	2	+0%	100/15 Summer				122.207	-0.197
S1.004	S10	15 Summer	2	+0%	100/15 Summer				122.043	-0.170
S3.000	S11	15 Summer	2	+0%	30/15 Summer				122.401	-0.124
S3.001	S12	15 Summer	2	+0%	30/15 Summer				122.371	-0.100
S3.002	S13	15 Summer	2	+0%	30/15 Summer				122.327	-0.082
S1.005	S14	60 Winter	2	+0%	30/120 Summer				121.923	-0.172
S1.006	S15	60 Winter	2	+0%	2/30 Summer				121.920	0.023
S1.007	S16	60 Winter	2	+0%					121.503	-0.248

PN	US/MH Name	Flooded		Half Drain		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)				
S1.000	S1	0.000	0.26		12.5		OK		
S1.001	S2	0.000	0.09		12.5		OK		
S1.002	S3	0.000	0.10		12.6		OK		
S1.003	S4	0.000	0.20		12.6		OK		
S2.000	S5	0.000	0.15		10.8		OK		
S2.001	S6	0.000	0.28		18.4		OK		
S2.002	S7	0.000	0.28		18.7		OK		
S2.003	S8	0.000	0.32		22.3		OK		

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S2.004	S9	0.000	0.26			22.0	OK	
S1.004	S10	0.000	0.40			34.0	OK	
S3.000	S11	0.000	0.34			10.1	OK	
S3.001	S12	0.000	0.58			17.4	OK	
S3.002	S13	0.000	0.72			21.8	OK	
S1.005	S14	0.000	0.05			5.7	OK	
S1.006	S15	0.000	0.06			4.1	SURCHARGED	
S1.007	S16	0.000	0.07			4.1	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 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) 19.800 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.400 Cv (Winter) 1.000

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S1.000	S1	15 Summer	30	+0%					127.363	-0.112
S1.001	S2	15 Summer	30	+0%					127.010	-0.164
S1.002	S3	15 Summer	30	+0%					123.208	-0.160
S1.003	S4	15 Summer	30	+0%	100/180 Winter				122.364	-0.129
S2.000	S5	15 Summer	30	+0%	100/15 Summer				122.643	-0.182
S2.001	S6	15 Summer	30	+0%	100/15 Summer				122.593	-0.130
S2.002	S7	15 Summer	30	+0%	100/15 Summer				122.485	-0.130
S2.003	S8	15 Summer	30	+0%	100/15 Summer				122.385	-0.116
S2.004	S9	15 Summer	30	+0%	100/15 Summer				122.264	-0.140
S1.004	S10	15 Summer	30	+0%	100/15 Summer				122.119	-0.094
S3.000	S11	15 Summer	30	+0%	30/15 Summer				122.618	0.093
S3.001	S12	15 Summer	30	+0%	30/15 Summer				122.587	0.116
S3.002	S13	15 Summer	30	+0%	30/15 Summer				122.492	0.083
S1.005	S14	120 Winter	30	+0%	30/120 Summer				122.114	0.020
S1.006	S15	120 Winter	30	+0%	2/30 Summer				122.226	0.329
S1.007	S16	960 Summer	30	+0%					121.503	-0.248

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)			
S1.000	S1	0.000	0.49		23.8	OK		
S1.001	S2	0.000	0.16		23.8	OK		
S1.002	S3	0.000	0.18		23.9	OK		
S1.003	S4	0.000	0.38		24.0	OK		
S2.000	S5	0.000	0.29		20.5	OK		
S2.001	S6	0.000	0.59		38.6	OK		
S2.002	S7	0.000	0.60		39.8	OK		
S2.003	S8	0.000	0.67		47.1	OK		

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

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
		Volume (m³)	Flow			Time (mins)	Flow (l/s)		
S2.004	S9	0.000	0.55				47.3	OK	
S1.004	S10	0.000	0.82				70.2	OK	
S3.000	S11	0.000	0.65				19.1	SURCHARGED	
S3.001	S12	0.000	1.19				35.9	SURCHARGED	
S3.002	S13	0.000	1.55				46.5	SURCHARGED	
S1.005	S14	0.000	0.09				10.3	SURCHARGED	
S1.006	S15	0.000	0.06				4.2	SURCHARGED	
S1.007	S16	0.000	0.07				4.2	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 0.000
 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) 19.800 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.400 Cv (Winter) 1.000

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Summer	100	+40%					127.418	-0.057
S1.001	S2	15 Summer	100	+40%					127.033	-0.141
S1.002	S3	15 Summer	100	+40%					123.232	-0.136
S1.003	S4	240 Winter	100	+40%	100/180 Winter				122.495	0.002
S2.000	S5	15 Summer	100	+40%	100/15 Summer				122.839	0.014
S2.001	S6	15 Summer	100	+40%	100/15 Summer				122.743	0.020
S2.002	S7	15 Summer	100	+40%	100/15 Summer				122.648	0.033
S2.003	S8	15 Summer	100	+40%	100/15 Summer				122.544	0.042
S2.004	S9	240 Winter	100	+40%	100/15 Summer				122.495	0.092
S1.004	S10	240 Winter	100	+40%	100/15 Summer				122.493	0.281
S3.000	S11	15 Summer	100	+40%	30/15 Summer				123.190	0.665
S3.001	S12	15 Summer	100	+40%	30/15 Summer				123.118	0.647
S3.002	S13	15 Summer	100	+40%	30/15 Summer				122.821	0.412
S1.005	S14	240 Winter	100	+40%	30/120 Summer				122.493	0.398
S1.006	S15	30 Winter	100	+40%	2/30 Summer				122.800	0.903
S1.007	S16	2160 Winter	100	+40%					121.503	-0.248

PN	US/MH Name	Flooded		Half Drain	Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
S1.000	S1	0.000	0.89			43.2	OK
S1.001	S2	0.000	0.29			43.2	OK
S1.002	S3	0.000	0.33			43.4	OK
S1.003	S4	0.000	0.12			7.8	SURCHARGED
S2.000	S5	0.000	0.51			36.0	SURCHARGED
S2.001	S6	0.000	1.01			66.4	SURCHARGED
S2.002	S7	0.000	0.96			63.2	SURCHARGED
S2.003	S8	0.000	1.07			74.9	SURCHARGED

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

PN	US/MH Name	Flooded		Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Cap.					
S2.004	S9	0.000	0.18			15.7	SURCHARGED	
S1.004	S10	0.000	0.27			23.0	SURCHARGED	
S3.000	S11	0.000	1.18			34.9	SURCHARGED	
S3.001	S12	0.000	2.15			64.7	SURCHARGED	
S3.002	S13	0.000	2.75			82.8	SURCHARGED	
S1.005	S14	0.000	0.12			14.0	SURCHARGED	
S1.006	S15	0.000	0.06			4.2	SURCHARGED	
S1.007	S16	0.000	0.07			4.2	OK	