

Project Moss Side St Vincents Storm Sewer Design

Critical Storms

SGi Consulting		Page 1
4th Floor, Colchester House 40 Peter Street Manchester, M2 5GP		
Date 26/06/2025 11:05 File C1876 SW DRAINAGE STRAT...		
Designed by sgicivils Checked by		
Micro Drainage		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)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	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.	1.000	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	0.357	4-8	0.257

Total Area Contributing (ha) = 0.614

Total Pipe Volume (m³) = 349.041

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)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	15.200	0.190	80.0	0.008	5.00	0.0	0.600		o	150	Pipe/Conduit	
1.001	18.875	0.235	80.3	0.028	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.002	16.000	0.200	80.0	0.009	0.00	0.0	0.600		o	225	Pipe/Conduit	
2.000	29.400	0.370	79.5	0.030	5.00	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)
1.000	50.00	5.23	31.250	0.008	0.0	0.0	0.0	1.12	19.9	1.4
1.001	50.00	5.44	30.985	0.036	0.0	0.0	0.0	1.46	58.1	6.5
1.002	50.00	5.62	30.750	0.045	0.0	0.0	0.0	1.46	58.2	8.1
2.000	50.00	5.43	31.250	0.030	0.0	0.0	0.0	1.13	19.9	5.4

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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)	n	HYD SECT	DIA (mm)	Section Type	
2.001	17.224	0.255	67.5	0.028	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.003	35.427	0.180	196.8	0.077	0.00	0.0		0.050	→[↓]		Cellular Storage	
3.000	66.150	0.705	93.8	0.129	5.00	0.0	0.600		o	300	Pipe/Conduit	
4.000	39.585	0.630	62.8	0.101	5.00	0.0	0.600		o	225	Pipe/Conduit	
3.001	24.949	0.250	99.8	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.004	24.473	0.125	195.8	0.000	0.00	0.0		0.050	→[↓]		Cellular Storage	
5.000	41.500	0.495	83.8	0.036	5.00	0.0	0.600		o	150	Pipe/Conduit	
5.001	19.166	0.195	98.3	0.010	0.00	0.0	0.600		o	225	Pipe/Conduit	
6.000	5.991	0.185	32.4	0.016	5.00	0.0	0.600		o	150	Pipe/Conduit	
6.001	5.019	0.160	31.4	0.003	0.00	0.0	0.600		o	150	Pipe/Conduit	
6.002	27.637	0.345	80.1	0.027	0.00	0.0	0.600		o	225	Pipe/Conduit	
5.002	4.600	0.050	92.0	0.021	0.00	0.0	0.600		o	300	Pipe/Conduit	
5.003	9.093	0.095	95.7	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)		
2.001	50.00	5.61	30.805	0.058		0.0	0.0	0.0	1.59	63.4	10.5	
1.003	50.00	6.34	30.400	0.180		0.0	0.0	0.0	0.83	3824.6	32.5	
3.000	50.00	5.68	31.250	0.129		0.0	0.0	0.0	1.62	114.8	23.3	
4.000	50.00	5.40	31.250	0.101		0.0	0.0	0.0	1.65	65.7	18.2	
3.001	50.00	5.91	30.470	0.230		0.0	0.0	0.0	1.81	200.3	41.5	
1.004	50.00	6.81	30.220	0.410		0.0	0.0	0.0	0.87	5828.2	74.0	
5.000	50.00	5.63	31.250	0.036		0.0	0.0	0.0	1.10	19.4	6.5	
5.001	50.00	5.87	30.680	0.046		0.0	0.0	0.0	1.32	52.4	8.3	
6.000	50.00	5.06	31.250	0.016		0.0	0.0	0.0	1.78	31.4	2.9	
6.001	50.00	5.10	31.065	0.019		0.0	0.0	0.0	1.80	31.9	3.4	
6.002	50.00	5.42	30.830	0.046		0.0	0.0	0.0	1.46	58.1	8.3	
5.002	50.00	5.92	30.410	0.113		0.0	0.0	0.0	1.64	115.9	20.4	
5.003	50.00	6.01	30.360	0.113		0.0	0.0	0.0	1.61	113.6	20.4	
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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)	n	HYD SECT	DIA (mm)	Section Type	Auto Design	
7.000	7.993	0.100	79.9	0.014	5.00	0.0	0.600		o	150	Pipe/Conduit		
7.001	8.395	0.735	11.4	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit		
5.004	9.146	0.095	96.3	0.014	0.00	0.0	0.600		o	300	Pipe/Conduit		
1.005	17.047	0.085	200.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit		
8.000	49.820	1.015	49.1	0.063	5.00	0.0	0.600		o	225	Pipe/Conduit		
1.006	1.978	0.025	79.1	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit		
1.007	7.224	0.600	12.0	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)			
7.000	50.00	5.12	31.250	0.014	0.0	0.0	0.0	1.13	19.9	2.5			
7.001	50.00	5.17	31.150	0.014	0.0	0.0	0.0	3.00	53.0	2.5			
5.004	50.00	6.11	30.265	0.141	0.0	0.0	0.0	1.60	113.3	25.5			
1.005	50.00	7.03	30.095	0.551	0.0	0.0	0.0	1.28	140.9	99.5			
8.000	50.00	5.44	31.250	0.063	0.0	0.0	0.0	1.87	74.4	11.4			
1.006	50.00	7.06	30.010	0.614	0.0	0.0	0.0	1.13	20.0«	110.9			
1.007	50.00	7.10	29.985	0.614	0.0	0.0	0.0	2.92	51.6«	110.9			
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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)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S100	32.600	1.350	Open Manhole	1200	1.000	31.250	150				
S101	32.400	1.415	Open Manhole	1200	1.001	30.985	225	1.000	31.060	150	
S102	32.600	1.850	Open Manhole	600	1.002	30.750	225	1.001	30.750	225	
S200	32.600	1.350	Open Manhole	1200	2.000	31.250	150				
S201	32.500	1.695	Open Manhole	1200	2.001	30.805	225	2.000	30.880	150	
S103	32.380	1.980	Open Manhole	1500	1.003	30.400		1.002	30.550	225	
								2.001	30.550	225	
S300	32.600	1.350	Open Manhole	1200	3.000	31.250	300				
S400	32.600	1.350	Open Manhole	1200	4.000	31.250	225				
S301	32.600	2.130	Open Manhole	1350	3.001	30.470	375	3.000	30.545	300	
								4.000	30.620	225	
S104	32.380	2.160	Open Manhole	1	1.004	30.220		1.003	30.220		
								3.001	30.220	375	
S500	32.600	1.350	Open Manhole	1200	5.000	31.250	150				
S501	32.600	1.920	Open Manhole	1200	5.001	30.680	225	5.000	30.755	150	
S600	32.600	1.350	Open Manhole	600	6.000	31.250	150				
S601	32.600	1.535	Open Manhole	600	6.001	31.065	150	6.000	31.065	150	
S602	32.600	1.770	Open Manhole	600	6.002	30.830	225	6.001	30.905	150	
S502	32.600	2.190	Open Manhole	600	5.002	30.410	300	5.001	30.485	225	
								6.002	30.485	225	
S503	32.500	2.140	Open Manhole	1200	5.003	30.360	300	5.002	30.360	300	
S700	32.600	1.350	Open Manhole	600	7.000	31.250	150				
S701	32.600	1.450	Open Manhole	600	7.001	31.150	150	7.000	31.150	150	
S504	32.550	2.285	Open Manhole	1200	5.004	30.265	300	5.003	30.265	300	
								7.001	30.415	150	
S105	32.380	2.285	Open Manhole	1500	1.005	30.095	375	1.004	30.095		
								5.004	30.170	300	
S800	32.400	1.150	Open Manhole	1200	8.000	31.250	225				
S106	32.380	2.370	Open Manhole	1500	1.006	30.010	150	1.005	30.010	375	
								8.000	30.235	225	
FW105	32.380	2.395	Open Manhole	1200	1.007	29.985	150	1.006	29.985	150	
	32.430	3.045	Open Manhole	0		OUTFALL		1.007	29.385	150	

300

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S100	383874.648	395703.920	383874.648	395703.920	Required	
S101	383859.449	395704.100	383859.449	395704.100	Required	
S102	383859.671	395722.974	383859.671	395722.974	Required	
S200	383886.478	395705.911	383886.478	395705.911	Required	
S201	383886.826	395735.309	383886.826	395735.309	Required	
S103	383869.603	395735.518	383869.603	395735.518	Required	
S300	383844.283	395705.087	383844.283	395705.087	Required	
S400	383843.529	395810.788	383843.529	395810.788	Required	
S301	383845.067	395771.233	383845.067	395771.233	Required	
S104	383870.015	395770.943	383870.015	395770.943	Required	
S500	383848.483	395840.859	383848.483	395840.859	Required	
S501	383887.539	395826.827	383887.539	395826.827	Required	
S600	383846.866	395824.475	383846.866	395824.475	Required	
S601	383852.504	395822.449	383852.504	395822.449	Required	
S602	383855.061	395818.130	383855.061	395818.130	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S502	383881.070	395808.786	383881.070	395808.786	Required	
S503	383879.517	395804.456	383879.517	395804.456	Required	
S700	383862.120	395812.645	383862.120	395812.645	Required	
S701	383862.030	395804.653	383862.030	395804.653	Required	
S504	383870.425	395804.559	383870.425	395804.559	Required	
S105	383870.299	395795.414	383870.299	395795.414	Required	
S800	383886.758	395745.555	383886.758	395745.555	Required	
S106	383887.346	395795.372	383887.346	395795.372	Required	
FW105	383888.224	395797.144	383888.224	395797.144	Required	
	383895.449	395797.126			No Entry	

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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	150	S100	32.600	31.250	1.200	Open Manhole	1200
1.001	o	225	S101	32.400	30.985	1.190	Open Manhole	1200
1.002	o	225	S102	32.600	30.750	1.625	Open Manhole	600
2.000	o	150	S200	32.600	31.250	1.200	Open Manhole	1200
2.001	o	225	S201	32.500	30.805	1.470	Open Manhole	1200
1.003 →[↓]			S103	32.380	30.400	0.779	Open Manhole	1500
3.000	o	300	S300	32.600	31.250	1.050	Open Manhole	1200
4.000	o	225	S400	32.600	31.250	1.125	Open Manhole	1200
3.001	o	375	S301	32.600	30.470	1.755	Open Manhole	1350
1.004 →[↓]			S104	32.380	30.220	0.959	Open Manhole	1
5.000	o	150	S500	32.600	31.250	1.200	Open Manhole	1200
5.001	o	225	S501	32.600	30.680	1.695	Open Manhole	1200
6.000	o	150	S600	32.600	31.250	1.200	Open Manhole	600

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	15.200	80.0	S101	32.400	31.060	1.190	Open Manhole	1200
1.001	18.875	80.3	S102	32.600	30.750	1.625	Open Manhole	600
1.002	16.000	80.0	S103	32.380	30.550	1.605	Open Manhole	1500
2.000	29.400	79.5	S201	32.500	30.880	1.470	Open Manhole	1200
2.001	17.224	67.5	S103	32.380	30.550	1.605	Open Manhole	1500
1.003	35.427	196.8	S104	32.380	30.220	0.959	Open Manhole	1
3.000	66.150	93.8	S301	32.600	30.545	1.755	Open Manhole	1350
4.000	39.585	62.8	S301	32.600	30.620	1.755	Open Manhole	1350
3.001	24.949	99.8	S104	32.380	30.220	1.785	Open Manhole	1
1.004	24.473	195.8	S105	32.380	30.095	1.084	Open Manhole	1500
5.000	41.500	83.8	S501	32.600	30.755	1.695	Open Manhole	1200
5.001	19.166	98.3	S502	32.600	30.485	1.890	Open Manhole	600
6.000	5.991	32.4	S601	32.600	31.065	1.385	Open Manhole	600

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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)
6.001	o	150	S601	32.600	31.065	1.385	Open Manhole	600
6.002	o	225	S602	32.600	30.830	1.545	Open Manhole	600
5.002	o	300	S502	32.600	30.410	1.890	Open Manhole	600
5.003	o	300	S503	32.500	30.360	1.840	Open Manhole	1200
7.000	o	150	S700	32.600	31.250	1.200	Open Manhole	600
7.001	o	150	S701	32.600	31.150	1.300	Open Manhole	600
5.004	o	300	S504	32.550	30.265	1.985	Open Manhole	1200
1.005	o	375	S105	32.380	30.095	1.910	Open Manhole	1500
8.000	o	225	S800	32.400	31.250	0.925	Open Manhole	1200
1.006	o	150	S106	32.380	30.010	2.220	Open Manhole	1500
1.007	o	150	FW105	32.380	29.985	2.245	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)
6.001	5.019	31.4	S602	32.600	30.905	1.545	Open Manhole	600
6.002	27.637	80.1	S502	32.600	30.485	1.890	Open Manhole	600
5.002	4.600	92.0	S503	32.500	30.360	1.840	Open Manhole	1200
5.003	9.093	95.7	S504	32.550	30.265	1.985	Open Manhole	1200
7.000	7.993	79.9	S701	32.600	31.150	1.300	Open Manhole	600
7.001	8.395	11.4	S504	32.550	30.415	1.985	Open Manhole	1200
5.004	9.146	96.3	S105	32.380	30.170	1.910	Open Manhole	1500
1.005	17.047	200.6	S106	32.380	30.010	1.995	Open Manhole	1500
8.000	49.820	49.1	S106	32.380	30.235	1.920	Open Manhole	1500
1.006	1.978	79.1	FW105	32.380	29.985	2.245	Open Manhole	1200
1.007	7.224	12.0		32.430	29.385	2.895	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	-	-	100	0.008	0.008	0.008
1.001	-	-	100	0.028	0.028	0.028
1.002	-	-	100	0.009	0.009	0.009
2.000	-	-	100	0.030	0.030	0.030
2.001	-	-	100	0.028	0.028	0.028
1.003	-	-	100	0.077	0.077	0.077
3.000	-	-	100	0.129	0.129	0.129
4.000	-	-	100	0.101	0.101	0.101
3.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.036	0.036	0.036
5.001	-	-	100	0.010	0.010	0.010
6.000	-	-	100	0.016	0.016	0.016
6.001	-	-	100	0.003	0.003	0.003
6.002	-	-	100	0.027	0.027	0.027
5.002	-	-	100	0.021	0.021	0.021
5.003	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.014	0.014	0.014
7.001	-	-	100	0.000	0.000	0.000
5.004	-	-	100	0.014	0.014	0.014
1.005	-	-	100	0.000	0.000	0.000
8.000	-	-	100	0.063	0.063	0.063
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.614	0.614	0.614

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Synthetic Rainfall Details <table><tr><td>Rainfall Model</td><td>FSR</td><td>Profile Type</td><td>Winter</td></tr><tr><td>Return Period (years)</td><td>100</td><td>Cv (Summer)</td><td>1.000</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>1.000</td></tr><tr><td>M5-60 (mm)</td><td>18.000</td><td>Storm Duration (mins)</td><td>30</td></tr><tr><td>Ratio R</td><td>0.360</td><td></td><td></td></tr></table>			Rainfall Model	FSR	Profile Type	Winter	Return Period (years)	100	Cv (Summer)	1.000	Region	England and Wales	Cv (Winter)	1.000	M5-60 (mm)	18.000	Storm Duration (mins)	30	Ratio R	0.360		
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S106, DS/PN: 1.006, Volume (m³): 7.8

Unit Reference	MD-SCU-0090-1250-2370-1250
Design Head (m)	2.370
Design Flow (l/s)	12.5
Flush-Flo™	Calculated
Objective	Linear discharge profile
Application	Surface
Sump Available	Yes
Diameter (mm)	90
Invert Level (m)	30.010
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.370	12.5
Flush-Flo™	0.114	3.3
Kick-Flo®	0.134	3.3
Mean Flow over Head Range	-	8.5

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)
0.100	3.1	1.200	9.0	3.000	14.0	7.000	21.0
0.200	3.9	1.400	9.7	3.500	15.1	7.500	21.7
0.300	4.7	1.600	10.4	4.000	16.1	8.000	22.4
0.400	5.4	1.800	11.0	4.500	17.0	8.500	23.1
0.500	6.0	2.000	11.5	5.000	17.9	9.000	23.7
0.600	6.5	2.200	12.1	5.500	18.7	9.500	24.4
0.800	7.5	2.400	12.6	6.000	19.5		
1.000	8.3	2.600	13.1	6.500	20.3		

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Storage Structures for Storm Cellular Storage Pipe: 1.003 Manning's N0.050Infiltration Coefficient Side (m/hr)0.00000 Invert Level (m)30.400Safety Factor1.0 Infiltration Coefficient Base (m/hr)0.00000Porosity0.95 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>144.0</td><td>0.0</td><td>1.201</td><td>0.0</td><td>0.0</td></tr><tr><td>1.200</td><td>144.0</td><td>0.0</td><td></td><td></td><td></td></tr></tbody></table> Cellular Storage Pipe: 1.004 Manning's N0.050Infiltration Coefficient Side (m/hr)0.00000 Invert Level (m)30.220Safety Factor1.0 Infiltration Coefficient Base (m/hr)0.00000Porosity0.95 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>144.0</td><td>0.0</td><td>1.201</td><td>0.0</td><td>0.0</td></tr><tr><td>1.200</td><td>144.0</td><td>0.0</td><td></td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	144.0	0.0	1.201	0.0	0.0	1.200	144.0	0.0				Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	144.0	0.0	1.201	0.0	0.0	1.200	144.0	0.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																	
0.000	144.0	0.0	1.201	0.0	0.0																																	
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0.000	144.0	0.0	1.201	0.0	0.0																																	
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Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	S100	1.527	0.269	0.000	1.795
1.001	S101	1.600	0.750	0.000	2.351
1.002	S102	0.523	0.636	0.000	1.159
2.000	S200	1.527	0.520	0.000	2.046
2.001	S201	1.917	0.685	0.000	2.602
1.003	S103	3.499	164.228	0.000	167.727
3.000	S300	1.527	4.676	0.000	6.203
4.000	S400	1.527	1.574	0.000	3.101
3.001	S301	3.049	2.756	0.000	5.804
1.004	S104	0.000	164.228	0.000	164.228
5.000	S500	1.527	0.733	0.000	2.260
5.001	S501	2.171	0.762	0.000	2.934
6.000	S600	0.382	0.106	0.000	0.488
6.001	S601	0.434	0.089	0.000	0.523
6.002	S602	0.500	1.099	0.000	1.599
5.002	S502	0.619	0.325	0.000	0.944
5.003	S503	2.420	0.643	0.000	3.063
7.000	S700	0.382	0.141	0.000	0.523
7.001	S701	0.410	0.148	0.000	0.558
5.004	S504	2.584	0.646	0.000	3.231
1.005	S105	4.038	1.883	0.000	5.921
8.000	S800	1.301	1.981	0.000	3.282
1.006	S106	4.188	0.035	0.000	4.223
1.007	FW105	2.709	0.128	0.000	2.836
Total		40.361	349.041	0.000	389.402

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Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	S100	1.527	0.247	0.000	1.774
1.001	S101	1.600	0.715	0.000	2.315
1.002	S102	0.523	0.594	0.000	1.117
2.000	S200	1.527	0.498	0.000	2.025
2.001	S201	1.917	0.631	0.000	2.548
1.003	S103	3.499	160.749	0.000	164.248
3.000	S300	1.527	4.586	0.000	6.113
4.000	S400	1.527	1.523	0.000	3.050
3.001	S301	3.049	2.681	0.000	5.730
1.004	S104	0.000	159.192	0.000	159.192
5.000	S500	1.527	0.712	0.000	2.239
5.001	S501	2.171	0.726	0.000	2.898
6.000	S600	0.382	0.095	0.000	0.477
6.001	S601	0.434	0.078	0.000	0.512
6.002	S602	0.500	1.075	0.000	1.575
5.002	S502	0.619	0.262	0.000	0.881
5.003	S503	2.420	0.558	0.000	2.978
7.000	S700	0.382	0.131	0.000	0.512
7.001	S701	0.410	0.132	0.000	0.542
5.004	S504	2.584	0.551	0.000	3.135
1.005	S105	4.038	1.717	0.000	5.755
8.000	S800	1.301	1.927	0.000	3.228
1.006	S106	4.188	0.011	0.000	4.199
1.007	FW105	2.709	0.117	0.000	2.826
Total		40.361	339.510	0.000	379.871

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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 Storage Structures 2

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 0.360

Region England and Wales Cv (Summer) 1.000

M5-60 (mm)

18.000 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

Return Period(s) (years)

1, 2, 5, 30, 100

Climate Change (%)

0, 0, 0, 40, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
1.000	S100	240 minute 100 year Winter I+45%	32.600	32.260	0.860	0.000	0.06
1.001	S101	240 minute 100 year Winter I+45%	32.400	32.259	1.049	0.000	0.09
1.002	S102	240 minute 100 year Winter I+45%	32.600	32.258	1.283	0.000	0.11
2.000	S200	240 minute 100 year Winter I+45%	32.600	32.262	0.862	0.000	0.22
2.001	S201	240 minute 100 year Winter I+45%	32.500	32.258	1.228	0.000	0.13
1.003	S103	240 minute 100 year Winter I+45%	32.380	32.256	0.655	0.000	0.00
3.000	S300	240 minute 100 year Winter I+45%	32.600	32.264	0.714	0.000	0.16
4.000	S400	240 minute 100 year Winter I+45%	32.600	32.265	0.790	0.000	0.22
3.001	S301	240 minute 100 year Winter I+45%	32.600	32.259	1.414	0.000	0.17
1.004	S104	240 minute 100 year Winter I+45%	32.380	32.256	0.835	0.000	0.00
5.000	S500	240 minute 100 year Winter I+45%	32.600	32.267	0.867	0.000	0.26
5.001	S501	240 minute 100 year Winter I+45%	32.600	32.262	1.357	0.000	0.12
6.000	S600	240 minute 100 year Winter I+45%	32.600	32.264	0.864	0.000	0.08
6.001	S601	240 minute 100 year Winter I+45%	32.600	32.263	1.048	0.000	0.10
6.002	S602	240 minute 100 year Winter I+45%	32.600	32.262	1.207	0.000	0.11
5.002	S502	240 minute 100 year Winter I+45%	32.600	32.260	1.550	0.000	0.23
5.003	S503	240 minute 100 year Winter I+45%	32.500	32.259	1.599	0.000	0.18
7.000	S700	240 minute 100 year Winter I+45%	32.600	32.260	0.860	0.000	0.11
7.001	S701	240 minute 100 year Winter I+45%	32.600	32.259	0.959	0.000	0.04

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
5.004	S504	240 minute 100 year Winter I+45%	32.550	32.258	1.693	0.000	0.23
1.005	S105	240 minute 100 year Winter I+45%	32.380	32.256	1.786	0.000	0.10
8.000	S800	240 minute 100 year Winter I+45%	32.400	32.254	0.779	0.000	0.12
1.006	S106	240 minute 100 year Winter I+45%	32.380	32.250	2.090	0.000	1.11
1.007	FW105	240 minute 100 year Winter I+45%	32.380	30.038	-0.097	0.000	0.27

PN	US/MH Name	Pipe Overflow (l/s)	Flow (l/s)	Status
5.004	S504	17.5	FLOOD RISK	
1.005	S105	10.8	FLOOD RISK	
8.000	S800	8.7	FLOOD RISK	
1.006	S106	12.0	FLOOD RISK	
1.007	FW105	12.0	OK	