

Barnsley Marshall		Page 1
1 Birch Court Blackpole East Worcester, WR3 8SG		
Date 12/03/2021 11:26 File SW Drainage - 22.0 lps ...	Designed by Alex Checked by	
Innovyze	Network 2020.1	

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)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.325	Minimum Backdrop Height (m)	4.000
Maximum Rainfall (mm/hr)	250	Maximum Backdrop Height (m)	4.000
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)	0.76
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	0.710	4-8	1.320	8-12	0.717	12-16	0.003

Total Area Contributing (ha) = 2.750

Total Pipe Volume (m³) = 20.620

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	33.240	0.202	164.8	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	38.235	0.224	170.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.001	7.049	0.040	174.8	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)
S1.000	53.85	5.71	28.834	0.000	0.0	0.0	0.0	0.78	13.8	0.0
S2.000	53.38	5.83	28.897	0.000	0.0	0.0	0.0	0.77	13.5	0.0
S2.001	52.79	5.99	28.673	0.000	0.0	0.0	0.0	0.76	13.4	0.0

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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
S1.001	28.777	0.170	169.6	0.239	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	19.865	0.196	101.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	13.831	0.081	170.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	47.053	0.275	171.2	0.166	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	76.078	0.446	170.5	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	29.005	0.171	169.9	0.244	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.002	11.998	0.071	169.9	0.045	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.003	4.969	0.362	13.7	0.080	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	45.002	0.264	170.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	15.817	0.093	170.0	0.090	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	29.411	0.173	169.8	0.206	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.000	56.129	0.329	170.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.001	6.861	0.040	170.6	0.174	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.002	40.586	0.324	125.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.003	12.907	0.244	52.9	0.185	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.004	16.340	0.157	104.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.005	7.516	0.045	167.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.006	26.403	0.648	40.7	0.068	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)
S1.001	50.58	6.61	28.633	0.239	0.0	0.0	13.1	0.77	13.6«	45.9
S1.002	49.49	6.94	28.463	0.239	0.0	0.0	13.1	1.00	17.6«	45.9
S1.003	48.55	7.24	28.267	0.239	0.0	0.0	13.1	0.77	13.5«	45.9
S1.004	45.65	8.27	28.186	0.405	0.0	0.0	20.0	0.77	13.5«	70.2
S3.000	50.44	6.65	28.961	0.000	0.0	0.0	0.0	0.77	13.5	0.0
S3.001	48.43	7.28	28.515	0.244	0.0	0.0	12.8	0.77	13.6«	44.8
S3.002	47.66	7.54	28.344	0.290	0.0	0.0	14.9	0.77	13.6«	52.3
S3.003	47.57	7.57	28.273	0.369	0.0	0.0	19.0	2.73	48.3«	66.6
S1.005	43.25	9.25	27.911	0.775	0.0	0.0	36.3	0.77	13.5«	127.0
S1.006	42.47	9.59	27.648	0.865	0.0	0.0	39.8	0.77	13.6«	139.3
S1.007	41.12	10.23	27.554	1.071	0.0	0.0	47.7	0.77	13.6«	166.9
S4.000	51.94	6.22	29.167	0.000	0.0	0.0	0.0	0.77	13.5	0.0
S4.001	51.41	6.37	28.838	0.174	0.0	0.0	9.7	0.77	13.5«	33.9
S4.002	48.92	7.13	28.798	0.174	0.0	0.0	9.7	0.90	15.8«	33.9
S4.003	48.44	7.28	28.474	0.359	0.0	0.0	18.8	1.39	24.5«	65.9
S4.004	47.62	7.56	28.230	0.359	0.0	0.0	18.8	0.98	17.4«	65.9
S4.005	47.15	7.72	28.074	0.359	0.0	0.0	18.8	0.77	13.7«	65.9
S4.006	46.38	8.00	28.029	0.427	0.0	0.0	21.5	1.58	27.9«	75.1

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Blackpole East

Worcester, WR3 8SG

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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
S1.008	17.251	0.101	171.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.009	16.529	0.097	170.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.010	10.398	0.061	169.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S5.000	22.237	0.130	170.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S5.001	7.273	0.575	12.6	0.100	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.011	48.297	0.284	170.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.012	45.920	0.395	116.3	0.238	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.000	54.321	0.663	81.9	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.001	7.499	0.059	127.8	0.088	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.002	33.866	0.374	90.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.003	4.782	0.045	106.6	0.066	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.004	25.796	0.216	119.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.000	70.752	0.848	83.5	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S7.001	23.862	0.307	77.7	0.300	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.005	25.924	0.151	171.4	0.083	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.013	20.047	0.118	170.6	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)
S1.008	40.37	10.60	27.381	1.498		0.0	0.0	65.5	13.5«	229.2
S1.009	39.68	10.96	27.280	1.498		0.0	0.0	65.5	13.5«	229.2
S1.010	39.26	11.19	27.184	1.498		0.0	0.0	65.5	13.6«	229.2
S5.000	54.76	5.48	27.827	0.000		0.0	0.0	0.0	13.5	0.0
S5.001	54.58	5.53	27.697	0.100		0.0	0.0	5.9	2.85	20.6
S1.011	37.46	12.24	27.122	1.597		0.0	0.0	65.5	13.6«	229.2
S1.012	36.17	13.06	26.838	1.836		0.0	0.0	71.9	16.5«	251.8
S6.000	53.45	5.81	27.952	0.000		0.0	0.0	0.0	19.6	0.0
S6.001	52.91	5.96	27.288	0.088		0.0	0.0	5.0	0.89	15.7«
S6.002	50.99	6.49	27.230	0.088		0.0	0.0	5.0	1.06	18.7
S6.003	50.71	6.57	26.856	0.154		0.0	0.0	8.5	0.97	17.2«
S6.004	49.19	7.04	26.811	0.154		0.0	0.0	8.5	0.92	16.2«
S7.000	52.48	6.07	27.750	0.000		0.0	0.0	0.0	1.10	19.5
S7.001	51.24	6.42	26.902	0.300		0.0	0.0	16.6	1.14	20.2«
S6.005	47.48	7.60	26.595	0.536		0.0	0.0	27.6	0.76	13.5«
S1.013	35.54	13.50	26.444	2.372		0.0	0.0	91.3	0.77	13.5«

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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
S8.000	33.673	0.698	48.3	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S8.001	8.247	0.206	40.0	0.153	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.014	10.617	0.343	31.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S9.000	33.990	0.424	80.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	23.160	0.188	123.1	0.225	0.00	0.0	0.600	o	150	Pipe/Conduit	
S9.002	18.274	0.107	171.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.015	11.447	0.067	171.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.016	11.389	0.067	170.0	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)
S8.000	55.16	5.39	27.230	0.000	0.0	0.0	0.0	1.45	25.7	0.0
S8.001	54.80	5.47	26.532	0.153	0.0	0.0	9.1	1.60	28.2«	31.8
S1.014	35.41	13.59	26.326	2.525	0.0	0.0	96.8	1.82	32.1«	339.0
S9.000	54.67	5.50	26.702	0.000	0.0	0.0	0.0	1.12	19.9	0.0
S9.001	53.00	5.93	26.278	0.225	0.0	0.0	12.9	0.90	16.0«	45.2
S9.002	51.55	6.33	26.090	0.225	0.0	0.0	12.9	0.76	13.5«	45.2
S1.015	35.06	13.84	25.983	2.750	0.0	0.0	104.5	0.76	13.5«	365.6
S1.016	34.81	14.03	25.917	2.750	0.0	0.0	104.5	1.00	39.8«	365.6

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Date 12/03/2021 11:26 File SW Drainage - 22.0 lps ...					Designed by Alex Checked by						
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<u>Manhole Schedules for Storm</u>											
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	30.184	1.350	Open Manhole	1200	S1.000	28.834	150				
S2	30.247	1.350	Open Manhole	1200	S2.000	28.897	150				
S3	30.230	1.557	Open Manhole	1200	S2.001	28.673	150	S2.000	28.673	150	
S4	30.182	1.550	Open Manhole	1200	S1.001	28.633	150	S1.000	28.633	150	
								S2.001	28.633	150	
S5	30.128	1.665	Open Manhole	1200	S1.002	28.463	150	S1.001	28.463	150	
S6	29.627	1.360	Open Manhole	1200	S1.003	28.267	150	S1.002	28.267	150	
S7	29.701	1.514	Open Manhole	1200	S1.004	28.186	150	S1.003	28.186	150	
S8	30.311	1.350	Open Manhole	1200	S3.000	28.961	150				
S9	30.660	2.146	Open Manhole	1200	S3.001	28.515	150	S3.000	28.515	150	
S10	30.228	1.884	Open Manhole	1200	S3.002	28.344	150	S3.001	28.344	150	
S11	30.099	1.826	Open Manhole	1200	S3.003	28.273	150	S3.002	28.273	150	
S12	30.082	2.170	Open Manhole	1200	S1.005	27.911	150	S1.004	27.911	150	
								S3.003	27.911	150	
S13	29.673	2.025	Open Manhole	1200	S1.006	27.648	150	S1.005	27.648	150	
S14	29.745	2.190	Open Manhole	1200	S1.007	27.554	150	S1.006	27.554	150	
S15	30.517	1.350	Open Manhole	1200	S4.000	29.167	150				
S16	30.371	1.533	Open Manhole	1200	S4.001	28.838	150	S4.000	28.838	150	
S17	30.259	1.461	Open Manhole	1200	S4.002	28.798	150	S4.001	28.798	150	
S18	29.824	1.350	Open Manhole	1200	S4.003	28.474	150	S4.002	28.474	150	
S19	29.579	1.348	Open Manhole	1200	S4.004	28.230	150	S4.003	28.230	150	
S20	29.423	1.349	Open Manhole	1200	S4.005	28.074	150	S4.004	28.074	150	
S21	29.426	1.397	Open Manhole	1200	S4.006	28.029	150	S4.005	28.029	150	
S22	29.371	1.990	Open Manhole	1200	S1.008	27.381	150	S1.007	27.381	150	
								S4.006	27.381	150	
S23	29.252	1.971	Open Manhole	1200	S1.009	27.280	150	S1.008	27.280	150	
S24	29.224	2.041	Open Manhole	1200	S1.010	27.184	150	S1.009	27.184	150	
S25	29.177	1.350	Open Manhole	1200	S5.000	27.827	150				
S25	29.134	1.437	Open Manhole	1200	S5.001	27.697	150	S5.000	27.697	150	
S26	29.140	2.018	Open Manhole	1200	S1.011	27.122	150	S1.010	27.122	150	
								S5.001	27.122	150	
S27	28.468	1.629	Open Manhole	1200	S1.012	26.838	150	S1.011	26.838	150	
S28	29.302	1.350	Open Manhole	1200	S6.000	27.952	150				
S29	28.638	1.350	Open Manhole	1200	S6.001	27.288	150	S6.000	27.288	150	
S30	28.580	1.350	Open Manhole	1200	S6.002	27.230	150	S6.001	27.230	150	
S31	28.206	1.350	Open Manhole	1200	S6.003	26.856	150	S6.002	26.856	150	
S32	28.162	1.351	Open Manhole	1200	S6.004	26.811	150	S6.003	26.811	150	
S33	29.101	1.351	Open Manhole	1200	S7.000	27.750	150				
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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)	Back (mm)
S34	28.252	1.350	Open Manhole	1200	S7.001	26.902	150	S7.000	26.902	150	
S35	27.944	1.349	Open Manhole	1200	S6.005	26.595	150	S6.004	26.595	150	
								S7.001	26.595	150	
S36	27.823	1.380	Open Manhole	1200	S1.013	26.444	150	S1.012	26.444	150	
								S6.005	26.444	150	
S37	28.580	1.350	Open Manhole	1200	S8.000	27.230	150				
S38	27.882	1.350	Open Manhole	1200	S8.001	26.532	150	S8.000	26.532	150	
S39	27.838	1.512	Open Manhole	1200	S1.014	26.326	150	S1.013	26.326	150	
								S8.001	26.326	150	
S40	28.053	1.350	Open Manhole	1200	S9.000	26.702	150				
S41	27.628	1.350	Open Manhole	1200	S9.001	26.278	150	S9.000	26.278	150	
S42	27.444	1.354	Open Manhole	1200	S9.002	26.090	150	S9.001	26.090	150	
S43	27.768	1.784	Open Manhole	1200	S1.015	25.983	150	S1.014	25.983	150	
								S9.002	25.983	150	
S44	27.656	1.739	Open Manhole	1200	S1.016	25.917	225	S1.015	25.917	150	
SHWtoDitch	27.513	1.663	Open Manhole	0		OUTFALL		S1.016	25.850	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	337626.867	349357.492	337626.867	349357.492	Required	
S2	337618.933	349355.603	337618.933	349355.603	Required	
S3	337647.832	349330.568	337647.832	349330.568	Required	
S4	337652.265	349336.049	337652.265	349336.049	Required	
S5	337673.330	349355.655	337673.330	349355.655	Required	
S6	337692.805	349351.737	337692.805	349351.737	Required	
S7	337703.371	349342.813	337703.371	349342.813	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)
S37	337821.054	349461.796	337821.054	349461.796	Required	
S38	337842.759	349487.539	337842.759	349487.539	Required	
S39	337850.749	349489.583	337850.749	349489.583	Required	
S40	337913.260	349475.113	337913.260	349475.113	Required	
S41	337887.149	349496.873	337887.149	349496.873	Required	
S42	337869.349	349511.690	337869.349	349511.690	Required	
S43	337857.626	349497.672	337857.626	349497.672	Required	
S44	337849.061	349505.266	337849.061	349505.266	Required	
SHWtoDitch	337840.474	349512.748			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)
S1.000	o	150	S1	30.184	28.834	1.200	Open Manhole	1200
S2.000	o	150	S2	30.247	28.897	1.200	Open Manhole	1200
S2.001	o	150	S3	30.230	28.673	1.407	Open Manhole	1200
S1.001	o	150	S4	30.182	28.633	1.400	Open Manhole	1200
S1.002	o	150	S5	30.128	28.463	1.515	Open Manhole	1200
S1.003	o	150	S6	29.627	28.267	1.210	Open Manhole	1200
S1.004	o	150	S7	29.701	28.186	1.364	Open Manhole	1200
S3.000	o	150	S8	30.311	28.961	1.200	Open Manhole	1200
S3.001	o	150	S9	30.660	28.515	1.996	Open Manhole	1200
S3.002	o	150	S10	30.228	28.344	1.734	Open Manhole	1200
S3.003	o	150	S11	30.099	28.273	1.676	Open Manhole	1200
S1.005	o	150	S12	30.082	27.911	2.020	Open Manhole	1200
S1.006	o	150	S13	29.673	27.648	1.875	Open Manhole	1200
S1.007	o	150	S14	29.745	27.554	2.040	Open Manhole	1200
S4.000	o	150	S15	30.517	29.167	1.200	Open Manhole	1200
S4.001	o	150	S16	30.371	28.838	1.383	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	33.240	164.8	S4	30.182	28.633	1.400	Open Manhole	1200
S2.000	38.235	170.6	S3	30.230	28.673	1.407	Open Manhole	1200
S2.001	7.049	174.8	S4	30.182	28.633	1.400	Open Manhole	1200
S1.001	28.777	169.6	S5	30.128	28.463	1.515	Open Manhole	1200
S1.002	19.865	101.6	S6	29.627	28.267	1.210	Open Manhole	1200
S1.003	13.831	170.6	S7	29.701	28.186	1.364	Open Manhole	1200
S1.004	47.053	171.2	S12	30.082	27.911	2.020	Open Manhole	1200
S3.000	76.078	170.5	S9	30.660	28.515	1.996	Open Manhole	1200
S3.001	29.005	169.9	S10	30.228	28.344	1.734	Open Manhole	1200
S3.002	11.998	169.9	S11	30.099	28.273	1.676	Open Manhole	1200
S3.003	4.969	13.7	S12	30.082	27.911	2.020	Open Manhole	1200
S1.005	45.002	170.6	S13	29.673	27.648	1.875	Open Manhole	1200
S1.006	15.817	170.0	S14	29.745	27.554	2.040	Open Manhole	1200
S1.007	29.411	169.8	S22	29.371	27.381	1.840	Open Manhole	1200
S4.000	56.129	170.6	S16	30.371	28.838	1.383	Open Manhole	1200
S4.001	6.861	170.6	S17	30.259	28.798	1.311	Open Manhole	1200

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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)
S4.002	o	150	S17	30.259	28.798	1.311	Open Manhole	1200
S4.003	o	150	S18	29.824	28.474	1.200	Open Manhole	1200
S4.004	o	150	S19	29.579	28.230	1.198	Open Manhole	1200
S4.005	o	150	S20	29.423	28.074	1.199	Open Manhole	1200
S4.006	o	150	S21	29.426	28.029	1.247	Open Manhole	1200
S1.008	o	150	S22	29.371	27.381	1.840	Open Manhole	1200
S1.009	o	150	S23	29.252	27.280	1.821	Open Manhole	1200
S1.010	o	150	S24	29.224	27.184	1.891	Open Manhole	1200
S5.000	o	150	S25	29.177	27.827	1.200	Open Manhole	1200
S5.001	o	150	S25	29.134	27.697	1.287	Open Manhole	1200
S1.011	o	150	S26	29.140	27.122	1.867	Open Manhole	1200
S1.012	o	150	S27	28.468	26.838	1.479	Open Manhole	1200
S6.000	o	150	S28	29.302	27.952	1.200	Open Manhole	1200
S6.001	o	150	S29	28.638	27.288	1.200	Open Manhole	1200
S6.002	o	150	S30	28.580	27.230	1.200	Open Manhole	1200
S6.003	o	150	S31	28.206	26.856	1.200	Open Manhole	1200
S6.004	o	150	S32	28.162	26.811	1.201	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)
S4.002	40.586	125.5	S18	29.824	28.474	1.200	Open Manhole	1200
S4.003	12.907	52.9	S19	29.579	28.230	1.198	Open Manhole	1200
S4.004	16.340	104.4	S20	29.423	28.074	1.199	Open Manhole	1200
S4.005	7.516	167.9	S21	29.426	28.029	1.247	Open Manhole	1200
S4.006	26.403	40.7	S22	29.371	27.381	1.840	Open Manhole	1200
S1.008	17.251	171.2	S23	29.252	27.280	1.821	Open Manhole	1200
S1.009	16.529	170.9	S24	29.224	27.184	1.891	Open Manhole	1200
S1.010	10.398	169.7	S26	29.140	27.122	1.867	Open Manhole	1200
S5.000	22.237	170.6	S25	29.134	27.697	1.287	Open Manhole	1200
S5.001	7.273	12.6	S26	29.140	27.122	1.868	Open Manhole	1200
S1.011	48.297	170.1	S27	28.468	26.838	1.479	Open Manhole	1200
S1.012	45.920	116.3	S36	27.823	26.444	1.230	Open Manhole	1200
S6.000	54.321	81.9	S29	28.638	27.288	1.200	Open Manhole	1200
S6.001	7.499	127.8	S30	28.580	27.230	1.200	Open Manhole	1200
S6.002	33.866	90.6	S31	28.206	26.856	1.200	Open Manhole	1200
S6.003	4.782	106.6	S32	28.162	26.811	1.201	Open Manhole	1200
S6.004	25.796	119.3	S35	27.944	26.595	1.199	Open Manhole	1200

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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)
S7.000	o	150	S33	29.101	27.750	1.201	Open Manhole	1200
S7.001	o	150	S34	28.252	26.902	1.200	Open Manhole	1200
S6.005	o	150	S35	27.944	26.595	1.199	Open Manhole	1200
S1.013	o	150	S36	27.823	26.444	1.230	Open Manhole	1200
S8.000	o	150	S37	28.580	27.230	1.200	Open Manhole	1200
S8.001	o	150	S38	27.882	26.532	1.200	Open Manhole	1200
S1.014	o	150	S39	27.838	26.326	1.362	Open Manhole	1200
S9.000	o	150	S40	28.053	26.702	1.200	Open Manhole	1200
S9.001	o	150	S41	27.628	26.278	1.200	Open Manhole	1200
S9.002	o	150	S42	27.444	26.090	1.204	Open Manhole	1200
S1.015	o	150	S43	27.768	25.983	1.634	Open Manhole	1200
S1.016	o	225	S44	27.656	25.917	1.514	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)
S7.000	70.752	83.5	S34	28.252	26.902	1.200	Open Manhole	1200
S7.001	23.862	77.7	S35	27.944	26.595	1.199	Open Manhole	1200
S6.005	25.924	171.4	S36	27.823	26.444	1.230	Open Manhole	1200
S1.013	20.047	170.6	S39	27.838	26.326	1.362	Open Manhole	1200
S8.000	33.673	48.3	S38	27.882	26.532	1.200	Open Manhole	1200
S8.001	8.247	40.0	S39	27.838	26.326	1.362	Open Manhole	1200
S1.014	10.617	31.0	S43	27.768	25.983	1.634	Open Manhole	1200
S9.000	33.990	80.1	S41	27.628	26.278	1.200	Open Manhole	1200
S9.001	23.160	123.1	S42	27.444	26.090	1.204	Open Manhole	1200
S9.002	18.274	171.6	S43	27.768	25.983	1.634	Open Manhole	1200
S1.015	11.447	171.9	S44	27.656	25.917	1.589	Open Manhole	1200
S1.016	11.389	170.0	SHWtoDitch	27.513	25.850	1.438	Open Manhole	0

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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)
S1.016	SHWtoDitch	27.513	25.850	25.500	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	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 Storage Structures	18
Number of Online Controls	19	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)	18.000	Storm Duration (mins)	30
Ratio R	0.325		

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Online Controls for Storm

Orifice Manhole: S4, DS/PN: S1.001, Volume (m³): 2.4

Diameter (m) 0.056 Discharge Coefficient 0.600 Invert Level (m) 28.633

Orifice Manhole: S7, DS/PN: S1.004, Volume (m³): 1.9

Diameter (m) 0.061 Discharge Coefficient 0.600 Invert Level (m) 28.186

Orifice Manhole: S9, DS/PN: S3.001, Volume (m³): 3.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 28.515

Orifice Manhole: S10, DS/PN: S3.002, Volume (m³): 2.6

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 28.344

Orifice Manhole: S11, DS/PN: S3.003, Volume (m³): 2.3

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 28.273

Orifice Manhole: S13, DS/PN: S1.006, Volume (m³): 3.1

Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 27.648

Hydro-Brake® Optimum Manhole: S14, DS/PN: S1.007, Volume (m³): 2.7

Unit Reference	MD-SCL-0145-1200-1200-1200
Design Head (m)	1.200
Design Flow (l/s)	12.0
Flush-Flo™	Calculated
Objective	Minimise blockage risk
Application	Surface
Sump Available	Yes
Diameter (mm)	145
Invert Level (m)	27.554
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	12.0
Flush-Flo™	0.276	12.0
Kick-Flo®	0.694	9.3
Mean Flow over Head Range	-	10.1

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

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Hydro-Brake® Optimum Manhole: S14, DS/PN: S1.007, Volume (m³): 2.7

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.8	1.200	12.0	3.000	18.5	7.000	27.7
0.200	11.8	1.400	12.9	3.500	19.9	7.500	28.7
0.300	12.0	1.600	13.7	4.000	21.2	8.000	29.6
0.400	11.7	1.800	14.5	4.500	22.4	8.500	30.5
0.500	11.2	2.000	15.3	5.000	23.6	9.000	31.3
0.600	10.6	2.200	16.0	5.500	24.7	9.500	32.1
0.800	9.9	2.400	16.6	6.000	25.8		
1.000	11.0	2.600	17.3	6.500	26.8		

Orifice Manhole: S16, DS/PN: S4.001, Volume (m³): 2.7

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 28.838

Orifice Manhole: S18, DS/PN: S4.003, Volume (m³): 2.2

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 28.474

Orifice Manhole: S21, DS/PN: S4.006, Volume (m³): 1.7

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 28.029

Orifice Manhole: S25, DS/PN: S5.001, Volume (m³): 2.0

Diameter (m) 0.056 Discharge Coefficient 0.600 Invert Level (m) 27.697

Orifice Manhole: S27, DS/PN: S1.012, Volume (m³): 2.7

Diameter (m) 0.074 Discharge Coefficient 0.600 Invert Level (m) 26.838

Orifice Manhole: S29, DS/PN: S6.001, Volume (m³): 2.5

Diameter (m) 0.039 Discharge Coefficient 0.600 Invert Level (m) 27.288

Orifice Manhole: S31, DS/PN: S6.003, Volume (m³): 2.1

Diameter (m) 0.039 Discharge Coefficient 0.600 Invert Level (m) 26.856

Orifice Manhole: S34, DS/PN: S7.001, Volume (m³): 2.8

Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 26.902

Orifice Manhole: S35, DS/PN: S6.005, Volume (m³): 2.4

Diameter (m) 0.090 Discharge Coefficient 0.600 Invert Level (m) 26.595

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Orifice Manhole: S38, DS/PN: S8.001, Volume (m³): 2.1

Diameter (m) 0.074 Discharge Coefficient 0.600 Invert Level (m) 26.532

Orifice Manhole: S41, DS/PN: S9.001, Volume (m³): 2.1

Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 26.278

Complex Manhole: S44, DS/PN: S1.016, Volume (m³): 2.1

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0176-1450-0700-1450
Design Head (m)	0.700
Design Flow (l/s)	14.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	176
Invert Level (m)	25.917
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	14.5
Flush-Flo™	0.276	14.5
Kick-Flo®	0.531	12.7
Mean Flow over Head Range	-	11.9

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	6.2	1.200	18.7	3.000	29.0	7.000	43.7
0.200	14.2	1.400	20.2	3.500	31.3	7.500	45.0
0.300	14.5	1.600	21.5	4.000	33.4	8.000	46.5
0.400	14.1	1.800	22.7	4.500	35.3	8.500	47.9
0.500	13.3	2.000	23.9	5.000	37.2	9.000	49.4
0.600	13.5	2.200	25.0	5.500	38.9	9.500	50.7
0.800	15.4	2.400	26.1	6.000	40.6		
1.000	17.2	2.600	27.1	6.500	42.2		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0229-2600-0500-2600
Design Head (m)	0.500
Design Flow (l/s)	26.0

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Hydro-Brake® Optimum

Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	229
Invert Level (m)	26.617
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	26.0
Flush-Flo™	0.310	26.0
Kick-Flo®	0.443	24.5
Mean Flow over Head Range	-	18.9

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	7.6	1.200	39.6	3.000	61.6	7.000	92.7
0.200	22.9	1.400	42.6	3.500	66.4	7.500	96.1
0.300	26.0	1.600	45.4	4.000	70.9	8.000	99.2
0.400	25.3	1.800	48.1	4.500	75.1	8.500	102.3
0.500	26.0	2.000	50.6	5.000	79.0	9.000	105.4
0.600	28.4	2.200	53.0	5.500	82.0	9.500	108.3
0.800	32.6	2.400	55.3	6.000	85.7		
1.000	36.2	2.600	57.5	6.500	89.3		

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<u>Storage Structures for Storm</u> <u>Cellular Storage Manhole: S4, DS/PN: S1.001</u> Invert Level (m) 28.633 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><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><tr><td>0.000</td><td>350.0</td><td>0.0</td><td>0.401</td><td>0.0</td><td>0.0</td></tr><tr><td>0.400</td><td>350.0</td><td>0.0</td><td></td><td></td><td></td></tr></table> <u>Cellular Storage Manhole: S7, DS/PN: S1.004</u> Invert Level (m) 28.186 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><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><tr><td>0.000</td><td>120.0</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr><tr><td>0.800</td><td>120.0</td><td>0.0</td><td></td><td></td><td></td></tr></table> <u>Cellular Storage Manhole: S9, DS/PN: S3.001</u> Invert Level (m) 28.515 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><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><tr><td>0.000</td><td>345.0</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr><tr><td>0.800</td><td>345.0</td><td>0.0</td><td></td><td></td><td></td></tr></table> <u>Cellular Storage Manhole: S10, DS/PN: S3.002</u> Invert Level (m) 28.344 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><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><tr><td>0.000</td><td>18.4</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr><tr><td>0.800</td><td>18.4</td><td>0.0</td><td></td><td></td><td></td></tr></table> <u>Cellular Storage Manhole: S11, DS/PN: S3.003</u> Invert Level (m) 28.273 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	350.0	0.0	0.401	0.0	0.0	0.400	350.0	0.0				Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	120.0	0.0	0.801	0.0	0.0	0.800	120.0	0.0				Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	345.0	0.0	0.801	0.0	0.0	0.800	345.0	0.0				Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	18.4	0.0	0.801	0.0	0.0	0.800	18.4	0.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																					
0.000	350.0	0.0	0.401	0.0	0.0																																																																					
0.400	350.0	0.0																																																																								
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																					
0.000	120.0	0.0	0.801	0.0	0.0																																																																					
0.800	120.0	0.0																																																																								
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																					
0.000	345.0	0.0	0.801	0.0	0.0																																																																					
0.800	345.0	0.0																																																																								
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																					
0.000	18.4	0.0	0.801	0.0	0.0																																																																					
0.800	18.4	0.0																																																																								
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Cellular Storage Manhole: S11, DS/PN: S3.003

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	78.9	0.0	0.801	0.0	0.0
0.800	78.9	0.0			

Cellular Storage Manhole: S13, DS/PN: S1.006

Invert Level (m) 27.648 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	150.0	0.0	0.801	0.0	0.0
0.800	150.0	0.0			

Cellular Storage Manhole: S14, DS/PN: S1.007

Invert Level (m) 27.554 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	240.0	0.0	1.201	0.0	0.0
1.200	240.0	0.0			

Cellular Storage Manhole: S16, DS/PN: S4.001

Invert Level (m) 28.838 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	150.0	0.0	0.801	0.0	0.0
0.800	150.0	0.0			

Cellular Storage Manhole: S18, DS/PN: S4.003

Invert Level (m) 28.474 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	250.0	0.0	0.801	0.0	0.0
0.800	250.0	0.0			

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Cellular Storage Manhole: S21, DS/PN: S4.006

Invert Level (m) 28.029 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	80.0	0.0	0.801	0.0	0.0
0.800	80.0	0.0			

Cellular Storage Manhole: S25, DS/PN: S5.001

Invert Level (m) 27.697 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	90.0	0.0	0.401	0.0	0.0
0.400	90.0	0.0			

Cellular Storage Manhole: S27, DS/PN: S1.012

Invert Level (m) 26.838 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	150.0	0.0	0.801	0.0	0.0
0.800	150.0	0.0			

Cellular Storage Manhole: S29, DS/PN: S6.001

Invert Level (m) 27.288 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	100.0	0.0	0.401	0.0	0.0
0.400	100.0	0.0			

Cellular Storage Manhole: S31, DS/PN: S6.003

Invert Level (m) 26.856 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	150.0	0.0	0.400	150.0	0.0

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Cellular Storage Manhole: S31, DS/PN: S6.003

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.401	0.0	0.0			

Cellular Storage Manhole: S34, DS/PN: S7.001

Invert Level (m) 26.902 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	300.0	0.0	0.801	0.0	0.0
0.800	300.0	0.0			

Cellular Storage Manhole: S35, DS/PN: S6.005

Invert Level (m) 26.595 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	100.0	0.0	0.801	0.0	0.0
0.800	100.0	0.0			

Cellular Storage Manhole: S38, DS/PN: S8.001

Invert Level (m) 26.532 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

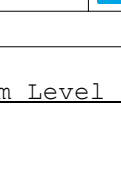
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	72.3	0.0	0.801	0.0	0.0
0.800	72.3	0.0			

Cellular Storage Manhole: S41, DS/PN: S9.001

Invert Level (m) 26.278 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	164.5	0.0	0.801	0.0	0.0
0.800	164.5	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 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 18
Number of Online Controls 19	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 0.323
Region England and Wales Cv (Summer)	0.750	
M5-60 (mm)	18.000 Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	150.0
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)	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.
S1.000	S1	15 Summer	1	+40%	100/180 Winter			
S2.000	S2	15 Summer	1	+40%	100/360 Winter			
S2.001	S3	480 Winter	1	+40%	30/60 Summer			
S1.001	S4	480 Winter	1	+40%	30/30 Summer			
S1.002	S5	480 Winter	1	+40%	30/60 Winter			
S1.003	S6	480 Winter	1	+40%	1/480 Winter			
S1.004	S7	480 Winter	1	+40%	1/60 Winter			
S3.000	S8	15 Summer	1	+40%	100/600 Winter			
S3.001	S9	2160 Winter	1	+40%	1/240 Winter			
S3.002	S10	1440 Winter	1	+40%	1/15 Winter			
S3.003	S11	1440 Winter	1	+40%	1/120 Summer			
S1.005	S12	1440 Winter	1	+40%	1/600 Winter			
S1.006	S13	1440 Winter	1	+40%	1/120 Summer			
S1.007	S14	240 Winter	1	+40%	30/30 Summer			
S4.000	S15	15 Summer	1	+40%	30/180 Winter			
S4.001	S16	720 Winter	1	+40%	1/120 Summer			
S4.002	S17	720 Winter	1	+40%	30/480 Winter			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	28.834	-0.150	0.000	0.00		0.0	OK
S2.000	S2	28.897	-0.150	0.000	0.00		0.0	OK
S2.001	S3	28.757	-0.066	0.000	0.00		0.0	OK
S1.001	S4	28.757	-0.026	0.000	0.16	299	2.0	OK
S1.002	S5	28.498	-0.115	0.000	0.12		2.0	OK
S1.003	S6	28.418	0.001	0.000	0.16		2.0	SURCHARGED
S1.004	S7	28.410	0.073	0.000	0.26	268	3.4	SURCHARGED
S3.000	S8	28.961	-0.150	0.000	0.00		0.0	OK
S3.001	S9	28.727	0.063	0.000	0.05	1162	0.7	SURCHARGED
S3.002	S10	28.670	0.176	0.000	0.06	1658	0.8	SURCHARGED
S3.003	S11	28.543	0.120	0.000	0.03	1444	1.1	SURCHARGED
S1.005	S12	28.119	0.058	0.000	0.31		4.1	SURCHARGED
S1.006	S13	28.091	0.293	0.000	0.29	551	3.6	SURCHARGED
S1.007	S14	27.658	-0.047	0.000	0.46		6.1	OK
S4.000	S15	29.167	-0.150	0.000	0.00		0.0	OK
S4.001	S16	29.070	0.082	0.000	0.09	456	1.0	SURCHARGED
S4.002	S17	28.823	-0.125	0.000	0.06		1.0	OK

PN	US/MH Name	Level Exceeded
S1.000	S1	
S2.000	S2	
S2.001	S3	
S1.001	S4	
S1.002	S5	
S1.003	S6	
S1.004	S7	
S3.000	S8	
S3.001	S9	
S3.002	S10	
S3.003	S11	
S1.005	S12	
S1.006	S13	
S1.007	S14	
S4.000	S15	
S4.001	S16	
S4.002	S17	

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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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S4.003	S18	2880 Winter	1	+40%	1/180 Winter			
S4.004	S19	2880 Winter	1	+40%	30/120 Winter			
S4.005	S20	2880 Winter	1	+40%	1/360 Winter			
S4.006	S21	2880 Winter	1	+40%	1/180 Summer			
S1.008	S22	720 Winter	1	+40%	30/30 Summer			
S1.009	S23	720 Winter	1	+40%	1/360 Winter			
S1.010	S24	720 Winter	1	+40%	1/240 Winter			
S5.000	S25	15 Summer	1	+40%	30/60 Winter			
S5.001	S25	180 Winter	1	+40%	30/15 Summer			
S1.011	S26	720 Winter	1	+40%	1/180 Winter			
S1.012	S27	960 Winter	1	+40%	1/30 Summer			
S6.000	S28	15 Summer	1	+40%				
S6.001	S29	360 Winter	1	+40%	30/15 Winter			
S6.002	S30	360 Winter	1	+40%	100/240 Winter			
S6.003	S31	960 Winter	1	+40%	30/60 Summer			
S6.004	S32	960 Winter	1	+40%	30/120 Summer			
S7.000	S33	15 Summer	1	+40%				
S7.001	S34	600 Winter	1	+40%	1/120 Winter			
S6.005	S35	480 Winter	1	+40%	1/480 Winter			
S1.013	S36	480 Winter	1	+40%	1/120 Winter			
S8.000	S37	15 Summer	1	+40%				
S8.001	S38	120 Winter	1	+40%	1/30 Winter			
S1.014	S39	360 Winter	1	+40%	1/120 Winter			
S9.000	S40	15 Summer	1	+40%	30/180 Winter			
S9.001	S41	480 Winter	1	+40%	1/60 Winter	100/480 Winter		
S9.002	S42	480 Winter	1	+40%	1/60 Winter			
S1.015	S43	480 Winter	1	+40%	1/30 Winter			
S1.016	S44	480 Winter	1	+40%	1/60 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S4.003	S18	28.767	0.143	0.000	0.05	1222	1.1	SURCHARGED
S4.004	S19	28.374	-0.006	0.000	0.07		1.1	OK
S4.005	S20	28.369	0.145	0.000	0.10		1.1	SURCHARGED
S4.006	S21	28.366	0.187	0.000	0.05	1429	1.2	SURCHARGED
S1.008	S22	27.493	-0.039	0.000	0.51		6.4	OK
S1.009	S23	27.466	0.036	0.000	0.51		6.4	SURCHARGED
S1.010	S24	27.440	0.106	0.000	0.52		6.3	SURCHARGED
S5.000	S25	27.827	-0.150	0.000	0.00		0.0	OK
S5.001	S25	27.821	-0.026	0.000	0.05	88	2.0	OK
S1.011	S26	27.419	0.147	0.000	0.59		7.8	SURCHARGED
S1.012	S27	27.346	0.357	0.000	0.49	544	7.8	SURCHARGED
S6.000	S28	27.952	-0.150	0.000	0.00		0.0	OK
S6.001	S29	27.416	-0.023	0.000	0.08	179	1.0	OK
S6.002	S30	27.253	-0.127	0.000	0.06		1.0	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 * 10m ³ /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	18
Number of Online Controls	19	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	0.323
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	150.0
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)	1, 30, 100
Climate Change (%)	40, 40, 40

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.
S1.000	S1	480 Winter	30	+40%	100/180	Winter		
S2.000	S2	480 Winter	30	+40%	100/360	Winter		
S2.001	S3	480 Winter	30	+40%	30/60	Summer		
S1.001	S4	480 Winter	30	+40%	30/30	Summer		
S1.002	S5	960 Winter	30	+40%	30/60	Winter		
S1.003	S6	960 Winter	30	+40%	1/480	Winter		
S1.004	S7	960 Winter	30	+40%	1/60	Winter		
S3.000	S8	2160 Winter	30	+40%	100/600	Winter		
S3.001	S9	2160 Winter	30	+40%	1/240	Winter		
S3.002	S10	1440 Winter	30	+40%	1/15	Winter		
S3.003	S11	1440 Winter	30	+40%	1/120	Summer		
S1.005	S12	960 Winter	30	+40%	1/600	Winter		
S1.006	S13	960 Winter	30	+40%	1/120	Summer		
S1.007	S14	960 Winter	30	+40%	30/30	Summer		

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level	Depth	Volume			Time	Flow	
		(m)	(m)	(m³)			(mins)	(l/s)	
S1.000	S1	28.924	-0.060	0.000	0.00			0.0	OK
S2.000	S2	28.924	-0.123	0.000	0.00			0.0	OK
S2.001	S3	28.924	0.101	0.000	0.00			0.0	SURCHARGED
S1.001	S4	28.924	0.142	0.000	0.23		405	3.0	SURCHARGED
S1.002	S5	28.790	0.177	0.000	0.18			2.9	SURCHARGED
S1.003	S6	28.781	0.364	0.000	0.23			2.9	SURCHARGED
S1.004	S7	28.773	0.437	0.000	0.36		654	4.8	SURCHARGED
S3.000	S8	29.040	-0.071	0.000	0.00			0.0	OK
S3.001	S9	29.040	0.375	0.000	0.07		1728	0.9	SURCHARGED
S3.002	S10	28.981	0.487	0.000	0.08			1.0	SURCHARGED
S3.003	S11	28.848	0.424	0.000	0.04		1452	1.4	SURCHARGED
S1.005	S12	28.632	0.571	0.000	0.45			6.0	SURCHARGED
S1.006	S13	28.601	0.804	0.000	0.35			4.4	SURCHARGED
S1.007	S14	28.035	0.331	0.000	0.52		589	6.8	SURCHARGED

PN	US/MH		Level Exceeded
	Name		
S1.000	S1		
S2.000	S2		
S2.001	S3		
S1.001	S4		
S1.002	S5		
S1.003	S6		
S1.004	S7		
S3.000	S8		
S3.001	S9		
S3.002	S10		
S3.003	S11		
S1.005	S12		
S1.006	S13		
S1.007	S14		

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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.
S4.000	S15	720 Winter	30	+40%	30/180 Winter			
S4.001	S16	720 Winter	30	+40%	1/120 Summer			
S4.002	S17	2160 Winter	30	+40%	30/480 Winter			
S4.003	S18	2160 Winter	30	+40%	1/180 Winter			
S4.004	S19	2880 Winter	30	+40%	30/120 Winter			
S4.005	S20	2880 Winter	30	+40%	1/360 Winter			
S4.006	S21	2880 Winter	30	+40%	1/180 Summer			
S1.008	S22	960 Winter	30	+40%	30/30 Summer			
S1.009	S23	960 Winter	30	+40%	1/360 Winter			
S1.010	S24	360 Winter	30	+40%	1/240 Winter			
S5.000	S25	180 Winter	30	+40%	30/60 Winter			
S5.001	S25	180 Winter	30	+40%	30/15 Summer			
S1.011	S26	360 Winter	30	+40%	1/180 Winter			
S1.012	S27	480 Winter	30	+40%	1/30 Summer			
S6.000	S28	15 Summer	30	+40%				
S6.001	S29	240 Winter	30	+40%	30/15 Winter			
S6.002	S30	720 Winter	30	+40%	100/240 Winter			
S6.003	S31	720 Winter	30	+40%	30/60 Summer			
S6.004	S32	720 Winter	30	+40%	30/120 Summer			
S7.000	S33	15 Summer	30	+40%				
S7.001	S34	600 Winter	30	+40%	1/120 Winter			
S6.005	S35	720 Winter	30	+40%	1/480 Winter			
S1.013	S36	720 Winter	30	+40%	1/120 Winter			
S8.000	S37	15 Summer	30	+40%				
S8.001	S38	120 Winter	30	+40%	1/30 Winter			
S1.014	S39	600 Winter	30	+40%	1/120 Winter			
S9.000	S40	720 Winter	30	+40%	30/180 Winter			
S9.001	S41	720 Winter	30	+40%	1/60 Winter	100/480 Winter		
S9.002	S42	600 Winter	30	+40%	1/60 Winter			
S1.015	S43	600 Winter	30	+40%	1/30 Winter			
S1.016	S44	600 Winter	30	+40%	1/60 Winter			

		Water	Surcharged	Flooded				Half Drain	Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow		
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status	
S4.000	S15	29.390	0.073	0.000	0.00			0.0	SURCHARGED	
S4.001	S16	29.390	0.402	0.000	0.12		764	1.4	SURCHARGED	
S4.002	S17	29.091	0.143	0.000	0.08			1.2	SURCHARGED	
S4.003	S18	29.084	0.460	0.000	0.06		1714	1.4	SURCHARGED	
S4.004	S19	28.648	0.267	0.000	0.09			1.4	SURCHARGED	
S4.005	S20	28.642	0.418	0.000	0.12			1.4	SURCHARGED	
S4.006	S21	28.638	0.459	0.000	0.06		2680	1.6	SURCHARGED	
S1.008	S22	27.926	0.395	0.000	0.60			7.6	SURCHARGED	
S1.009	S23	27.901	0.470	0.000	0.61			7.6	SURCHARGED	
S1.010	S24	27.888	0.555	0.000	0.64			7.7	SURCHARGED	
S5.000	S25	28.007	0.030	0.000	0.00			0.0	SURCHARGED	

Barnsley Marshall

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S5.001	S25	28.007	0.160	0.000	0.08	112	3.6	SURCHARGED
S1.011	S26	27.887	0.615	0.000	0.75		9.9	SURCHARGED
S1.012	S27	27.872	0.884	0.000	0.62		9.9	SURCHARGED
S6.000	S28	27.952	-0.150	0.000	0.00		0.0	OK
S6.001	S29	27.601	0.162	0.000	0.13	216	1.7	SURCHARGED
S6.002	S30	27.318	-0.062	0.000	0.09		1.6	OK
S6.003	S31	27.311	0.305	0.000	0.11	619	1.4	SURCHARGED
S6.004	S32	27.125	0.164	0.000	0.09		1.4	SURCHARGED
S7.000	S33	27.750	-0.150	0.000	0.00		0.0	OK
S7.001	S34	27.352	0.300	0.000	0.16	524	3.1	SURCHARGED
S6.005	S35	27.120	0.375	0.000	0.38	773	4.9	SURCHARGED
S1.013	S36	27.031	0.438	0.000	1.06		13.5	SURCHARGED
S8.000	S37	27.230	-0.150	0.000	0.00		0.0	OK
S8.001	S38	27.065	0.383	0.000	0.26		6.3	SURCHARGED
S1.014	S39	26.908	0.432	0.000	0.54		15.6	SURCHARGED
S9.000	S40	26.945	0.093	0.000	0.00		0.0	SURCHARGED
S9.001	S41	26.945	0.517	0.000	0.14		2.2	SURCHARGED
S9.002	S42	26.816	0.577	0.000	0.16		2.0	SURCHARGED
S1.015	S43	26.808	0.674	0.000	1.43		17.4	SURCHARGED
S1.016	S44	26.671	0.529	0.000	0.52		17.4	SURCHARGED

US/MH Level

PN Name Exceeded

S4.000 S15

S4.001 S16

S4.002 S17

S4.003 S18

S4.004 S19

S4.005 S20

S4.006 S21

S1.008 S22

S1.009 S23

S1.010 S24

S5.000 S25

S5.001 S25

S1.011 S26

S1.012 S27

S6.000 S28

S6.001 S29

S6.002 S30

S6.003 S31

S6.004 S32

S7.000 S33

S7.001 S34

S6.005 S35

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	<table><thead><tr><th>PN</th><th>US/MH Name</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>S1.013</td><td>S36</td><td></td></tr><tr><td>S8.000</td><td>S37</td><td></td></tr><tr><td>S8.001</td><td>S38</td><td></td></tr><tr><td>S1.014</td><td>S39</td><td></td></tr><tr><td>S9.000</td><td>S40</td><td></td></tr><tr><td>S9.001</td><td>S41</td><td>3</td></tr><tr><td>S9.002</td><td>S42</td><td></td></tr><tr><td>S1.015</td><td>S43</td><td></td></tr><tr><td>S1.016</td><td>S44</td><td></td></tr></tbody></table>	PN	US/MH Name	Level Exceeded	S1.013	S36		S8.000	S37		S8.001	S38		S1.014	S39		S9.000	S40		S9.001	S41	3	S9.002	S42		S1.015	S43		S1.016	S44		
PN	US/MH Name	Level Exceeded																														
S1.013	S36																															
S8.000	S37																															
S8.001	S38																															
S1.014	S39																															
S9.000	S40																															
S9.001	S41	3																														
S9.002	S42																															
S1.015	S43																															
S1.016	S44																															
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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 * 10m ³ /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	18
Number of Online Controls	19	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	0.323
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	150.0
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)	1, 30, 100
Climate Change (%)	40, 40, 40

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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	600 Winter	100	+40%	100/180	Winter		
S2.000	S2	600 Winter	100	+40%	100/360	Winter		
S2.001	S3	600 Winter	100	+40%	30/60	Summer		
S1.001	S4	600 Winter	100	+40%	30/30	Summer		
S1.002	S5	600 Winter	100	+40%	30/60	Winter		
S1.003	S6	600 Winter	100	+40%	1/480	Winter		
S1.004	S7	600 Winter	100	+40%	1/60	Winter		
S3.000	S8	2160 Winter	100	+40%	100/600	Winter		
S3.001	S9	2160 Winter	100	+40%	1/240	Winter		
S3.002	S10	960 Winter	100	+40%	1/15	Winter		
S3.003	S11	720 Winter	100	+40%	1/120	Summer		
S1.005	S12	720 Winter	100	+40%	1/600	Winter		
S1.006	S13	720 Winter	100	+40%	1/120	Summer		
S1.007	S14	960 Winter	100	+40%	30/30	Summer		

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

PN	US/MH Name	Water		Surcharged		Flooded		Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S1.000	S1	29.417	0.433	0.000	0.02				0.3	SURCHARGED
S2.000	S2	29.417	0.370	0.000	0.02				0.3	SURCHARGED
S2.001	S3	29.417	0.594	0.000	0.06				0.7	SURCHARGED
S1.001	S4	29.417	0.634	0.000	0.25		627		3.2	SURCHARGED
S1.002	S5	29.299	0.687	0.000	0.19				3.2	SURCHARGED
S1.003	S6	29.289	0.872	0.000	0.25				3.2	SURCHARGED
S1.004	S7	29.280	0.944	0.000	0.40				5.3	SURCHARGED
S3.000	S8	29.231	0.120	0.000	0.00				0.0	SURCHARGED
S3.001	S9	29.231	0.566	0.000	0.08		2149		1.0	SURCHARGED
S3.002	S10	29.187	0.693	0.000	0.08				1.0	SURCHARGED
S3.003	S11	29.179	0.755	0.000	0.04				1.6	SURCHARGED
S1.005	S12	29.063	1.002	0.000	0.49				6.5	SURCHARGED
S1.006	S13	29.030	1.232	0.000	0.38				4.7	SURCHARGED
S1.007	S14	28.323	0.619	0.000	0.53		684		6.8	SURCHARGED

PN	US/MH		Level Exceeded
	Name		
S1.000	S1		
S2.000	S2		
S2.001	S3		
S1.001	S4		
S1.002	S5		
S1.003	S6		
S1.004	S7		
S3.000	S8		
S3.001	S9		
S3.002	S10		
S3.003	S11		
S1.005	S12		
S1.006	S13		
S1.007	S14		

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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.
S4.000	S15	720 Winter	100	+40%	30/180 Winter			
S4.001	S16	720 Winter	100	+40%	1/120 Summer			
S4.002	S17	2160 Winter	100	+40%	30/480 Winter			
S4.003	S18	2160 Winter	100	+40%	1/180 Winter			
S4.004	S19	1440 Winter	100	+40%	30/120 Winter			
S4.005	S20	1440 Winter	100	+40%	1/360 Winter			
S4.006	S21	1440 Winter	100	+40%	1/180 Summer			
S1.008	S22	720 Winter	100	+40%	30/30 Summer			
S1.009	S23	240 Winter	100	+40%	1/360 Winter			
S1.010	S24	240 Winter	100	+40%	1/240 Winter			
S5.000	S25	240 Winter	100	+40%	30/60 Winter			
S5.001	S25	240 Winter	100	+40%	30/15 Summer			
S1.011	S26	240 Winter	100	+40%	1/180 Winter			
S1.012	S27	180 Winter	100	+40%	1/30 Summer			
S6.000	S28	240 Winter	100	+40%				
S6.001	S29	240 Winter	100	+40%	30/15 Winter			
S6.002	S30	600 Winter	100	+40%	100/240 Winter			
S6.003	S31	600 Winter	100	+40%	30/60 Summer			
S6.004	S32	720 Winter	100	+40%	30/120 Summer			
S7.000	S33	15 Summer	100	+40%				
S7.001	S34	600 Winter	100	+40%	1/120 Winter			
S6.005	S35	720 Winter	100	+40%	1/480 Winter			
S1.013	S36	600 Winter	100	+40%	1/120 Winter			
S8.000	S37	180 Winter	100	+40%				
S8.001	S38	180 Winter	100	+40%	1/30 Winter			
S1.014	S39	600 Winter	100	+40%	1/120 Winter			
S9.000	S40	600 Winter	100	+40%	30/180 Winter			
S9.001	S41	600 Winter	100	+40%	1/60 Winter	100/480 Winter		
S9.002	S42	600 Winter	100	+40%	1/60 Winter			
S1.015	S43	600 Winter	100	+40%	1/30 Winter			
S1.016	S44	600 Winter	100	+40%	1/60 Winter			

		Water		Surcharged		Flooded		Half Drain		Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow			
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status		
S4.000	S15	29.585	0.267	0.000	0.00			0.0	SURCHARGED		
S4.001	S16	29.585	0.596	0.000	0.13			1.5	SURCHARGED		
S4.002	S17	29.270	0.322	0.000	0.08			1.2	SURCHARGED		
S4.003	S18	29.263	0.638	0.000	0.07		1985	1.5	SURCHARGED		
S4.004	S19	28.788	0.407	0.000	0.09			1.5	SURCHARGED		
S4.005	S20	28.782	0.558	0.000	0.13			1.5	SURCHARGED		
S4.006	S21	28.777	0.598	0.000	0.07			1.8	SURCHARGED		
S1.008	S22	28.201	0.669	0.000	0.66			8.3	SURCHARGED		
S1.009	S23	28.253	0.823	0.000	0.67			8.4	SURCHARGED		
S1.010	S24	28.322	0.989	0.000	0.65			7.9	SURCHARGED		
S5.000	S25	29.003	1.026	0.000	0.05			0.6	SURCHARGED		

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S5.001	S25	29.003	1.156	0.000	0.12		243	5.3	FLOOD RISK
S1.011	S26	28.380	1.108	0.000	0.76			10.1	SURCHARGED
S1.012	S27	28.443	1.454	0.000	0.77			12.3	FLOOD RISK
S6.000	S28	28.061	-0.041	0.000	0.01			0.2	OK
S6.001	S29	28.061	0.623	0.000	0.20		286	2.8	SURCHARGED
S6.002	S30	27.770	0.390	0.000	0.11			1.9	SURCHARGED
S6.003	S31	27.762	0.756	0.000	0.16			2.1	SURCHARGED
S6.004	S32	27.322	0.361	0.000	0.13			2.0	SURCHARGED
S7.000	S33	27.750	-0.150	0.000	0.00			0.0	OK
S7.001	S34	27.525	0.473	0.000	0.17		561	3.2	SURCHARGED
S6.005	S35	27.311	0.566	0.000	0.43		840	5.6	SURCHARGED
S1.013	S36	27.195	0.602	0.000	1.19			15.2	SURCHARGED
S8.000	S37	27.275	-0.105	0.000	0.00			0.0	OK
S8.001	S38	27.275	0.593	0.000	0.25		181	6.3	SURCHARGED
S1.014	S39	27.052	0.576	0.000	0.62			17.9	SURCHARGED
S9.000	S40	27.629	0.777	0.000	0.02			0.3	SURCHARGED
S9.001	S41	27.629	1.201	0.603	0.31			4.6	FLOOD
S9.002	S42	26.948	0.708	0.000	0.37			4.6	SURCHARGED
S1.015	S43	26.927	0.794	0.000	1.81			22.0	SURCHARGED
S1.016	S44	26.710	0.568	0.000	0.65			22.0	SURCHARGED

PN	US/MH Name	Level Exceeded
S4.000	S15	
S4.001	S16	
S4.002	S17	
S4.003	S18	
S4.004	S19	
S4.005	S20	
S4.006	S21	
S1.008	S22	
S1.009	S23	
S1.010	S24	
S5.000	S25	
S5.001	S25	
S1.011	S26	
S1.012	S27	
S6.000	S28	
S6.001	S29	
S6.002	S30	
S6.003	S31	
S6.004	S32	
S7.000	S33	
S7.001	S34	
S6.005	S35	

Barnsley Marshall		Page 39																																											
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