

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.391	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	3.000
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

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	28.778	0.072	399.7	0.078	5.00	0.0	0.600	o	750	Pipe/Conduit	
1.001	30.470	0.076	400.9	0.078	0.00	0.0	0.600	o	750	Pipe/Conduit	
2.000	20.701	0.052	398.1	0.030	5.00	0.0	0.600	o	750	Pipe/Conduit	
2.001	16.177	0.040	404.4	0.029	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.002	15.601	0.038	410.6	0.021	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.003	17.000	0.043	395.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.004	30.884	1.206	25.6	0.025	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	25.108	0.126	199.3	0.125	0.00	0.0	0.600	o	750	Pipe/Conduit	
3.000	21.687	0.055	394.3	0.064	5.00	0.0	0.600	o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.34	49.220	0.078	0.0	0.0	0.0	1.39	615.7	10.6
1.001	50.00	5.71	49.148	0.156	0.0	0.0	0.0	1.39	614.7	21.1
2.000	50.00	5.25	49.164	0.030	0.0	0.0	0.0	1.40	616.9	4.1
2.001	50.00	5.44	49.112	0.059	0.0	0.0	0.0	1.39	612.0	8.0
1.002	50.00	5.90	49.072	0.236	0.0	0.0	0.0	1.37	607.4	32.0
1.003	50.00	6.10	49.034	0.236	0.0	0.0	0.0	1.40	619.1	32.0
1.004	50.00	5.26	48.991	0.000	5.0	0.0	0.0	2.00	35.3	5.0
1.005	50.00	5.47	45.000	0.125	5.0	0.0	0.0	1.98	874.2	21.9
3.000	50.00	5.26	44.929	0.064	0.0	0.0	0.0	1.40	619.9	8.7

The Alan Johnston Partnership		Page 2
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.006	62.905	0.157	400.7	0.075	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.007	12.204	0.031	393.7	0.120	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.008	23.323	0.062	376.2	0.049	0.00	0.0	0.600	o	750	Pipe/Conduit	
4.000	7.038	0.018	391.0	0.044	5.00	0.0	0.600	o	750	Pipe/Conduit	
4.001	35.690	0.089	401.0	0.035	0.00	0.0	0.600	o	750	Pipe/Conduit	
4.002	6.676	0.150	44.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.003	33.651	1.500	22.4	0.059	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.004	13.696	0.034	402.8	0.044	0.00	0.0	0.600	o	900	Pipe/Conduit	
4.005	22.286	0.056	398.0	0.027	0.00	0.0	0.600	o	900	Pipe/Conduit	
4.006	14.917	0.037	403.2	0.015	0.00	0.0	0.600	o	1200	Pipe/Conduit	
4.007	14.669	0.037	396.5	0.021	0.00	0.0	0.600	o	1500	Pipe/Conduit	
4.008	11.573	0.029	400.0	0.168	0.00	0.0	0.600	o	1800	Pipe/Conduit	
5.000	36.241	0.091	398.3	0.145	5.00	0.0	0.600	o	900	Pipe/Conduit	
5.001	23.839	0.060	397.3	0.074	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.002	7.101	0.018	394.5	0.080	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.003	9.274	0.057	162.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.004	21.280	0.130	163.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.009	22.489	0.056	401.6	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
4.010	40.714	0.102	399.2	0.148	0.00	0.0	0.600	o	1800	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.006	50.00	6.22	44.874	0.264	5.0	0.0	0.0	1.39	614.9	40.7
1.007	50.00	6.37	41.892	0.384	5.0	0.0	0.0	1.40	620.4	57.0
1.008	50.00	6.64	41.861	0.433	5.0	0.0	0.0	1.44	634.8	63.6
4.000	50.00	5.08	47.000	0.044	0.0	0.0	0.0	1.41	622.5	6.0
4.001	50.00	5.51	46.982	0.079	0.0	0.0	0.0	1.39	614.6	10.7
4.002	50.00	5.58	46.893	0.079	0.0	0.0	0.0	1.51	26.7	10.7
4.003	50.00	5.85	46.793	0.138	0.0	0.0	0.0	2.14	37.7	18.7
4.004	50.00	5.99	42.000	0.182	0.0	0.0	0.0	1.55	989.2	24.6
4.005	50.00	6.23	41.966	0.209	0.0	0.0	0.0	1.56	995.3	28.3
4.006	50.00	6.37	41.610	0.224	0.0	0.0	0.0	1.86	2100.2	30.3
4.007	50.00	6.48	41.273	0.245	0.0	0.0	0.0	2.15	3796.0	33.2
4.008	50.00	6.56	40.936	0.413	0.0	0.0	0.0	2.39	6084.1	55.9
5.000	50.00	5.39	44.750	0.145	0.0	0.0	0.0	1.56	994.9	19.6
5.001	50.00	5.64	44.659	0.219	0.0	0.0	0.0	1.57	996.1	29.7
5.002	50.00	5.72	44.599	0.299	0.0	0.0	0.0	1.57	999.7	40.5
5.003	50.00	5.15	44.581	0.000	15.0	0.0	0.0	1.02	40.6	15.0
5.004	50.00	5.50	44.524	0.000	15.0	0.0	0.0	1.02	40.5	15.0
4.009	50.00	6.72	40.907	0.413	15.0	0.0	0.0	2.39	6072.0	70.9
4.010	50.00	7.00	40.851	0.561	15.0	0.0	0.0	2.39	6090.6	91.0

The Alan Johnston Partnership		Page 3
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.009	33.634	0.084	400.4	0.172	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.010	10.232	0.300	34.1	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)
1.009	50.00	7.23	40.749	1.166	20.0	0.0	0.0	2.39	6081.1	177.9
1.010	50.00	5.06	40.665	0.000	19.2	0.0	0.0	2.70	190.9	19.2

The Alan Johnston Partnership		Page 4
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	51.810	2.590	Open Manhole	2100	1.000	49.220	750				
2	51.451	2.303	Open Manhole	2100	1.001	49.148	750	1.000	49.148	750	
3	51.524	2.360	Open Manhole	2100	2.000	49.164	750				
4	51.717	2.605	Open Manhole	2100	2.001	49.112	750	2.000	49.112	750	
5	51.577	2.505	Open Manhole	2100	1.002	49.072	750	1.001	49.072	750	
								2.001	49.072	750	
6	52.151	3.117	Open Manhole	2100	1.003	49.034	750	1.002	49.034	750	
7	52.381	3.390	Open Manhole	2100	1.004	48.991	150	1.003	48.991	750	
8	50.910	5.910	Open Manhole	2100	1.005	45.000	750	1.004	47.785	150	2185
9	49.157	4.228	Open Manhole	2100	3.000	44.929	750				
10	49.655	4.781	Open Manhole	2100	1.006	44.874	750	1.005	44.874	750	
								3.000	44.874	750	
11	46.847	4.955	Open Manhole	2100	1.007	41.892	750	1.006	44.717	750	2825
12	46.598	4.737	Open Manhole	2100	1.008	41.861	750	1.007	41.861	750	
13	51.081	4.081	Open Manhole	2100	4.000	47.000	750				
14	50.082	3.100	Open Manhole	2100	4.001	46.982	750	4.000	46.982	750	
16	48.200	1.307	Open Manhole	2100	4.002	46.893	150	4.001	46.893	750	
16a	47.750	1.007	Open Manhole	1500	4.003	46.793	150	4.002	46.743	150	
23	46.906	4.906	Open Manhole	2400	4.004	42.000	900	4.003	45.293	150	2543
24	46.681	4.715	Open Manhole	2400	4.005	41.966	900	4.004	41.966	900	
25	46.386	4.776	Open Manhole	3000	4.006	41.610	1200	4.005	41.910	900	
25a	46.386	5.113	Open Manhole	3000	4.007	41.273	1500	4.006	41.573	1200	
26	46.082	5.146	Open Manhole	3600	4.008	40.936	1800	4.007	41.236	1500	
17	50.302	5.552	Open Manhole	2400	5.000	44.750	900				
18	48.488	3.829	Open Manhole	2400	5.001	44.659	900	5.000	44.659	900	
19	47.296	2.697	Open Manhole	2400	5.002	44.599	900	5.001	44.599	900	
20	47.310	2.729	Open Manhole	2400	5.003	44.581	225	5.002	44.581	900	
21	46.500	1.976	Open Manhole	1500	5.004	44.524	225	5.003	44.524	225	
26A	46.000	5.093	Open Manhole	3600	4.009	40.907	1800	4.008	40.907	1800	
								5.004	44.394	225	1912
27	46.171	5.320	Open Manhole	3600	4.010	40.851	1800	4.009	40.851	1800	
28	46.282	5.533	Open Manhole	3600	1.009	40.749	1800	1.008	41.799	750	
								4.010	40.749	1800	
29	46.240	5.575	Open Manhole	3600	1.010	40.665	300	1.009	40.665	1800	
37	46.240	5.875	Open Manhole	0		OUTFALL		1.010	40.365	300	

The Alan Johnston Partnership		Page 5
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 7, DS/PN: 1.004, Volume (m³): 18.3

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	48.991
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)	1.200	5.0	Kick-Flo®	0.745	4.0
Flush-Flo™	0.354	5.0	Mean Flow over Head Range	-	4.4

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	3.4	0.800	4.1	2.000	6.3	4.000	8.8	7.000	11.5
0.200	4.7	1.000	4.6	2.200	6.6	4.500	9.3	7.500	11.8
0.300	5.0	1.200	5.0	2.400	6.9	5.000	9.8	8.000	12.2
0.400	5.0	1.400	5.4	2.600	7.2	5.500	10.2	8.500	12.6
0.500	4.9	1.600	5.7	3.000	7.7	6.000	10.7	9.000	12.9
0.600	4.7	1.800	6.0	3.500	8.3	6.500	11.1	9.500	13.3

Hydro-Brake® Optimum Manhole: 11, DS/PN: 1.007, Volume (m³): 44.0

Unit Reference	MD-SHE-0232-3000-1400-3000
Design Head (m)	1.400
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	232
Invert Level (m)	41.892
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	30.0	Kick-Flo®	0.967	25.1
Flush-Flo™	0.444	30.0	Mean Flow over Head Range	-	25.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as

The Alan Johnston Partnership		Page 6
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

Hydro-Brake® Optimum Manhole: 11, DS/PN: 1.007, Volume (m³): 44.0

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	7.7	0.800	28.3	2.000	35.6	4.000	49.7	7.000	65.2
0.200	23.3	1.000	25.5	2.200	37.3	4.500	52.6	7.500	67.4
0.300	29.2	1.200	27.9	2.400	38.9	5.000	55.4	8.000	69.6
0.400	29.9	1.400	30.0	2.600	40.4	5.500	58.0	8.500	71.7
0.500	29.9	1.600	32.0	3.000	43.3	6.000	60.5	9.000	73.7
0.600	29.5	1.800	33.8	3.500	46.6	6.500	62.9	9.500	75.7

Hydro-Brake® Optimum Manhole: 16, DS/PN: 4.002, Volume (m³): 19.4

Unit Reference	MD-SHE-0102-5000-1250-5000
Design Head (m)	1.250
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	102
Invert Level (m)	46.893
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)	1.250	5.0	Kick-Flo®	0.772	4.0
Flush-Flo™	0.370	5.0	Mean Flow over Head Range	-	4.4

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	3.4	0.800	4.1	2.000	6.2	4.000	8.6	7.000	11.2
0.200	4.7	1.000	4.5	2.200	6.5	4.500	9.1	7.500	11.6
0.300	5.0	1.200	4.9	2.400	6.8	5.000	9.6	8.000	12.0
0.400	5.0	1.400	5.3	2.600	7.0	5.500	10.0	8.500	12.3
0.500	4.9	1.600	5.6	3.000	7.5	6.000	10.4	9.000	12.7
0.600	4.7	1.800	5.9	3.500	8.1	6.500	10.9	9.500	13.0

Hydro-Brake® Optimum Manhole: 20, DS/PN: 5.003, Volume (m³): 15.3

Unit Reference	MD-SHE-0172-1500-1200-1500
Design Head (m)	1.200
Design Flow (l/s)	15.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface

The Alan Johnston Partnership		Page 7
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

Hydro-Brake® Optimum Manhole: 20, DS/PN: 5.003, Volume (m³): 15.3

Sump Available Yes
Diameter (mm) 172
Invert Level (m) 44.581
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	15.0	Kick-Flo®	0.805	12.4
Flush-Flo™	0.364	15.0	Mean Flow over Head Range	-	12.9

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)	Depth (m)	Flow (l/s)
0.100	6.1	0.800	12.5	2.000	19.1	4.000	26.6	7.000	34.9
0.200	14.1	1.000	13.8	2.200	20.0	4.500	28.2	7.500	36.1
0.300	14.9	1.200	15.0	2.400	20.9	5.000	29.7	8.000	37.2
0.400	15.0	1.400	16.1	2.600	21.7	5.500	31.1	8.500	38.3
0.500	14.8	1.600	17.2	3.000	23.2	6.000	32.4	9.000	39.4
0.600	14.4	1.800	18.2	3.500	25.0	6.500	33.7	9.500	40.4

Hydro-Brake® Optimum Manhole: 29, DS/PN: 1.010, Volume (m³): 133.2

Unit Reference MD-SHE-0162-1920-3250-1920
Design Head (m) 3.250
Design Flow (l/s) 19.2
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 162
Invert Level (m) 40.665
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	3.250	19.2	Kick-Flo®	1.455	13.1
Flush-Flo™	0.712	16.6	Mean Flow over Head Range	-	15.5

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)	Depth (m)	Flow (l/s)
0.100	5.8	0.500	16.2	1.200	15.4	2.000	15.2	3.000	18.5
0.200	13.0	0.600	16.5	1.400	13.8	2.200	15.9	3.500	19.9
0.300	14.7	0.800	16.6	1.600	13.7	2.400	16.6	4.000	21.2
0.400	15.7	1.000	16.2	1.800	14.5	2.600	17.2	4.500	22.4

The Alan Johnston Partnership		Page 8
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

Hydro-Brake® Optimum Manhole: 29, DS/PN: 1.010, Volume (m³): 133.2

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)
5.000	23.6	6.000	25.7	7.000	27.7	8.000	29.6	9.000	31.3
5.500	24.7	6.500	26.7	7.500	28.7	8.500	30.4	9.500	32.1

The Alan Johnston Partnership		Page 9
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 5 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.389 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 2, 100
 Climate Change (%) 0, 0, 40

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
1.000	1	120 Winter	100	+40%	100/30 Summer				51.434	1.464	0.000
1.001	2	120 Winter	100	+40%	100/30 Summer				51.434	1.536	0.000
2.000	3	120 Winter	100	+40%	100/30 Summer				51.434	1.520	0.000
2.001	4	120 Winter	100	+40%	100/15 Winter				51.434	1.572	0.000
1.002	5	120 Winter	100	+40%	100/15 Winter				51.434	1.612	0.000
1.003	6	120 Winter	100	+40%	100/15 Winter				51.433	1.649	0.000
1.004	7	120 Winter	100	+40%	1/15 Summer				51.433	2.292	0.000
1.005	8	30 Winter	100	+40%	100/15 Winter				46.670	0.920	0.000
3.000	9	30 Winter	100	+40%	100/15 Winter				46.669	0.990	0.000
1.006	10	30 Winter	100	+40%	100/15 Summer				46.668	1.044	0.000
1.007	11	30 Winter	100	+40%	1/15 Summer				46.661	4.019	0.000
1.008	12	240 Winter	100	+40%	100/30 Winter				45.749	3.138	0.000
4.000	13	60 Winter	100	+40%					47.667	-0.083	0.000
4.001	14	60 Winter	100	+40%					47.667	-0.065	0.000
4.002	16	60 Winter	100	+40%	1/15 Summer				47.667	0.624	0.000
4.003	16a	15 Winter	100	+40%	100/15 Summer				47.144	0.201	0.000
4.004	23	240 Winter	100	+40%	100/60 Summer				45.748	2.848	0.000
4.005	24	240 Winter	100	+40%	100/60 Summer				45.748	2.882	0.000
4.006	25	240 Winter	100	+40%	100/60 Summer				45.748	2.938	0.000
4.007	25a	240 Winter	100	+40%	100/60 Summer				45.748	2.975	0.000
4.008	26	240 Winter	100	+40%	100/30 Winter				45.748	3.012	0.000
5.000	17	60 Winter	100	+40%	100/15 Summer				47.246	1.596	0.000

The Alan Johnston Partnership		Page 10
1 Dale Street Liverpool L2 2ET		
Date 02/09/2022 09:17	Designed by JosephPoole	
File 221-130 MDX NETWORK 2022.09.01.MDX	Checked by	
XP Solutions	Network 2018.1.1	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
				Flow (l/s)		Exceeded
1.000	1	0.03		13.6	SURCHARGED	
1.001	2	0.04		18.4	FLOOD RISK	
2.000	3	0.01		4.2	FLOOD RISK	
2.001	4	0.01		2.6	FLOOD RISK	
1.002	5	0.04		11.8	FLOOD RISK	
1.003	6	0.02		6.6	SURCHARGED	
1.004	7	0.21		7.0	SURCHARGED	
1.005	8	0.10		60.7	SURCHARGED	
3.000	9	0.05		23.9	SURCHARGED	
1.006	10	0.15		82.5	SURCHARGED	
1.007	11	0.16		52.2	FLOOD RISK	
1.008	12	0.09		40.8	SURCHARGED	
4.000	13	0.04		12.3	OK	
4.001	14	0.04		19.9	OK	
4.002	16	0.22		5.0	SURCHARGED	
4.003	16a	1.06		38.7	SURCHARGED	
4.004	23	0.03		15.1	SURCHARGED	
4.005	24	0.03		17.1	SURCHARGED	
4.006	25	0.02		15.1	SURCHARGED	
4.007	25a	0.01		11.5	SURCHARGED	
4.008	26	0.01		15.9	SURCHARGED	
5.000	17	0.05		40.0	SURCHARGED	

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

			US/MH		Return Climate		First (X)		First (Y)		First (Z)		Overflow		Water Level	Surcharged Depth	Flooded Volume
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)						
5.001	18	60 Winter	100	+40%	100/15 Summer				47.245	1.686	0.000						
5.002	19	60 Winter	100	+40%	100/15 Summer				47.244	1.745	0.000						
5.003	20	60 Winter	100	+40%	1/15 Summer				47.243	2.437	0.000						
5.004	21	240 Winter	100	+40%	100/120 Summer				45.754	1.005	0.000						
4.009	26A	240 Winter	100	+40%	100/30 Winter				45.748	3.041	0.000						
4.010	27	240 Winter	100	+40%	100/30 Winter				45.748	3.097	0.000						
1.009	28	240 Winter	100	+40%	100/30 Summer				45.748	3.199	0.000						
1.010	29	240 Winter	100	+40%	1/15 Summer				45.748	4.783	0.000						

			US/MH		Pipe		Level	
PN	Name	Cap.	Flow / Overflow	Flow	Status	Exceeded		
5.001	18	0.04		29.4	SURCHARGED			
5.002	19	0.07		32.7	FLOOD RISK			
5.003	20	0.64		21.6	FLOOD RISK			
5.004	21	0.44		16.2	SURCHARGED			
4.009	26A	0.01		21.8	FLOOD RISK			
4.010	27	0.01		20.7	SURCHARGED			
1.009	28	0.01		38.3	SURCHARGED			
1.010	29	0.17		23.8	SURCHARGED			