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Studio 313 Scott House The Custard Factory, Gibb St... Birmingham, B9 4AA	BOLEYN ROAD REDNAL BIRMINGHAM	
Date 01/01/0001 File Storm 01.02.23 riaz.MDX	Designed by ZH Checked by	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for STORM 27.01.23.SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	0	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.700
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for STORM 27.01.23.SWS

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.707	4-8	0.371

Total Area Contributing (ha) = 1.078

Total Pipe Volume (m³) = 206.284

Network Design Table for STORM 27.01.23.SWS

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	14.412	0.030	480.4	0.049	4.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	13.000	0.025	520.0	0.049	0.00	0.0	0.600	o	975	Pipe/Conduit	
1.002	10.495	0.021	499.8	0.049	0.00	0.0	0.600	o	975	Pipe/Conduit	
1.003	16.795	0.034	494.0	0.049	0.00	0.0	0.600	o	975	Pipe/Conduit	
2.000	20.163	1.080	18.7	0.049	4.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	16.515	0.874	18.9	0.049	0.00	0.0	0.600	o	225	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	0.00	4.26	203.971	0.049	0.0	0.0	0.0	0.92	146.5	0.0
1.001	0.00	4.41	203.416	0.098	0.0	0.0	0.0	1.44	1072.7	0.0
1.002	0.00	4.53	203.391	0.147	0.0	0.0	0.0	1.47	1094.4	0.0
1.003	0.00	4.72	203.370	0.196	0.0	0.0	0.0	1.47	1100.8	0.0
2.000	0.00	4.11	207.280	0.049	0.0	0.0	0.0	3.04	121.0	0.0
2.001	0.00	4.20	206.200	0.098	0.0	0.0	0.0	3.02	120.2	0.0

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Network Design Table for STORM 27.01.23.SWS

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
2.002	27.439	1.240	22.1	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	43.832	0.089	492.5	0.049	0.00	0.0	0.600	o	975	Pipe/Conduit	
1.005	10.742	0.021	511.5	0.049	0.00	0.0	0.600	o	975	Pipe/Conduit	
3.000	26.254	1.199	21.9	0.049	4.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	22.806	0.346	65.9	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	8.820	0.316	27.9	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.003	19.404	0.479	40.5	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.004	19.154	0.038	504.1	0.049	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.005	27.968	0.056	499.4	0.049	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.006	23.231	0.068	341.6	0.049	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.006	58.525	0.117	500.2	0.049	0.00	0.0	0.600	o	1200	Pipe/Conduit	
4.000	13.044	0.075	173.9	0.049	4.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	34.534	0.957	36.1	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	16.011	0.843	19.0	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	12.707	0.450	28.2	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.004	33.111	0.066	501.7	0.049	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.007	24.613	2.324	10.6	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)
2.002	0.00	4.37	205.326	0.147	0.0	0.0	0.0	2.79	111.1	0.0
1.004	0.00	5.22	203.336	0.392	0.0	0.0	0.0	1.48	1102.5	0.0
1.005	0.00	5.34	203.247	0.441	0.0	0.0	0.0	1.45	1081.6	0.0
3.000	0.00	4.16	207.207	0.049	0.0	0.0	0.0	2.81	111.7	0.0
3.001	0.00	4.39	206.008	0.098	0.0	0.0	0.0	1.61	64.1	0.0
3.002	0.00	4.45	205.662	0.147	0.0	0.0	0.0	2.49	98.8	0.0
3.003	0.00	4.61	205.346	0.196	0.0	0.0	0.0	2.06	82.0	0.0
3.004	0.00	4.90	204.492	0.245	0.0	0.0	0.0	1.08	304.7	0.0
3.005	0.00	5.33	204.454	0.294	0.0	0.0	0.0	1.08	306.2	0.0
3.006	0.00	5.63	204.398	0.343	0.0	0.0	0.0	1.31	370.9	0.0
1.006	0.00	6.21	203.751	0.833	0.0	0.0	0.0	1.67	1884.1	0.0
4.000	0.00	4.22	207.000	0.049	0.0	0.0	0.0	0.99	39.3	0.0
4.001	0.00	4.48	206.925	0.098	0.0	0.0	0.0	2.18	86.9	0.0
4.002	0.00	4.57	205.968	0.147	0.0	0.0	0.0	3.02	119.9	0.0
4.003	0.00	4.66	205.125	0.196	0.0	0.0	0.0	2.47	98.3	0.0
4.004	0.00	4.99	203.700	0.245	0.0	0.0	0.0	1.66	1881.3	0.0
1.007	0.00	6.32	203.634	1.078	0.0	0.0	0.0	4.04	160.8	0.0

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Manhole Schedules for STORM 27.01.23.SWS

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)
S1	209.250	5.279	Open Manhole	1350	1.000	203.971	450				
S2	208.974	5.558	Open Manhole	2100	1.001	203.416	975	1.000	203.941	450	
S3	208.758	5.367	Open Manhole	2100	1.002	203.391	975	1.001	203.391	975	
S4	208.587	5.217	Open Manhole	2100	1.003	203.370	975	1.002	203.370	975	
S11	209.000	1.720	Open Manhole	1200	2.000	207.280	225				
S12	208.853	2.653	Open Manhole	1200	2.001	206.200	225	2.000	206.200	225	
S13	208.629	3.303	Open Manhole	1200	2.002	205.326	225	2.001	205.326	225	
S5	208.255	4.919	Open Manhole	2400	1.004	203.336	975	1.003	203.336	975	
								2.002	204.086	225	
S6	207.523	4.276	Open Manhole	2100	1.005	203.247	975	1.004	203.247	975	
S14	208.858	1.651	Open Manhole	1200	3.000	207.207	225				
S15	208.588	2.580	Open Manhole	1200	3.001	206.008	225	3.000	206.008	225	
S16	208.315	2.653	Open Manhole	1200	3.002	205.662	225	3.001	205.662	225	
S17	208.226	2.880	Open Manhole	1200	3.003	205.346	225	3.002	205.346	225	
S18	208.031	3.539	Open Manhole	1500	3.004	204.492	600	3.003	204.867	225	
S19	207.827	3.373	Open Manhole	1500	3.005	204.454	600	3.004	204.454	600	
S20	207.532	3.134	Open Manhole	1500	3.006	204.398	600	3.005	204.398	600	
S7	207.324	4.098	Open Manhole	2400	1.006	203.751	1200	1.005	203.226	975	
								3.006	204.330	600	
S21	208.364	1.364	Open Manhole	1200	4.000	207.000	225				
S22	208.163	1.238	Open Manhole	1200	4.001	206.925	225	4.000	206.925	225	
S23	207.304	1.336	Open Manhole	1200	4.002	205.968	225	4.001	205.968	225	
S24	206.885	1.760	Open Manhole	1200	4.003	205.125	225	4.002	205.125	225	
S25	206.589	2.889	Open Manhole	2100	4.004	203.700	1200	4.003	204.675	225	
FCC	206.073	2.439	Open Manhole	3000	1.007	203.634	225	1.006	203.634	1200	
								4.004	203.634	1200	
10	203.500	2.190	Open Manhole	0		OUTFALL		1.007	201.310	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	398675.613	278733.910	398675.613	278733.910	Required	
S2	398667.243	278722.178	398667.243	278722.178	Required	



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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S3	398665.300	278709.324	398665.300	278709.324	Required	
S4	398660.517	278699.982	398660.517	278699.982	Required	
S11	398619.879	278745.673	398619.879	278745.673	Required	
S12	398623.669	278725.869	398623.669	278725.869	Required	
S13	398629.968	278710.603	398629.968	278710.603	Required	
S5	398647.439	278689.445	398647.439	278689.445	Required	
S6	398623.522	278652.714	398623.522	278652.714	Required	
S14	398607.187	278751.077	398607.187	278751.077	Required	
S15	398583.273	278740.241	398583.273	278740.241	Required	
S16	398563.992	278728.060	398563.992	278728.060	Required	
S17	398563.843	278719.242	398563.843	278719.242	Required	
S18	398570.270	278700.933	398570.270	278700.933	Required	
S19	398579.163	278683.969	398579.163	278683.969	Required	
S20	398597.023	278662.447	398597.023	278662.447	Required	
S7	398614.405	278647.034	398614.405	278647.034	Required	

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Manhole Schedules for STORM 27.01.23.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S21	398530.064	278689.153	398530.064	278689.153	Required	
S22	398535.445	278677.271	398535.445	278677.271	Required	
S23	398539.870	278643.022	398539.870	278643.022	Required	
S24	398545.673	278628.099	398545.673	278628.099	Required	
S25	398552.549	278617.413	398552.549	278617.413	Required	
FCC	398580.354	278599.435	398580.354	278599.435	Required	
10	398604.967	278599.435			No Entry	

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PIPELINE SCHEDULES for STORM 27.01.23.SWS

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	450	S1	209.250	203.971	4.829	Open Manhole	1350
1.001	o	975	S2	208.974	203.416	4.583	Open Manhole	2100
1.002	o	975	S3	208.758	203.391	4.392	Open Manhole	2100
1.003	o	975	S4	208.587	203.370	4.242	Open Manhole	2100
2.000	o	225	S11	209.000	207.280	1.495	Open Manhole	1200
2.001	o	225	S12	208.853	206.200	2.428	Open Manhole	1200
2.002	o	225	S13	208.629	205.326	3.078	Open Manhole	1200
1.004	o	975	S5	208.255	203.336	3.944	Open Manhole	2400
1.005	o	975	S6	207.523	203.247	3.301	Open Manhole	2100
3.000	o	225	S14	208.858	207.207	1.426	Open Manhole	1200
3.001	o	225	S15	208.588	206.008	2.355	Open Manhole	1200
3.002	o	225	S16	208.315	205.662	2.428	Open Manhole	1200
3.003	o	225	S17	208.226	205.346	2.655	Open Manhole	1200
3.004	o	600	S18	208.031	204.492	2.939	Open Manhole	1500
3.005	o	600	S19	207.827	204.454	2.773	Open Manhole	1500
3.006	o	600	S20	207.532	204.398	2.534	Open Manhole	1500
1.006	o	1200	S7	207.324	203.751	2.373	Open Manhole	2400

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	14.412	480.4	S2	208.974	203.941	4.583	Open Manhole	2100
1.001	13.000	520.0	S3	208.758	203.391	4.392	Open Manhole	2100
1.002	10.495	499.8	S4	208.587	203.370	4.242	Open Manhole	2100
1.003	16.795	494.0	S5	208.255	203.336	3.944	Open Manhole	2400
2.000	20.163	18.7	S12	208.853	206.200	2.428	Open Manhole	1200
2.001	16.515	18.9	S13	208.629	205.326	3.078	Open Manhole	1200
2.002	27.439	22.1	S5	208.255	204.086	3.944	Open Manhole	2400
1.004	43.832	492.5	S6	207.523	203.247	3.301	Open Manhole	2100
1.005	10.742	511.5	S7	207.324	203.226	3.123	Open Manhole	2400
3.000	26.254	21.9	S15	208.588	206.008	2.355	Open Manhole	1200
3.001	22.806	65.9	S16	208.315	205.662	2.428	Open Manhole	1200
3.002	8.820	27.9	S17	208.226	205.346	2.655	Open Manhole	1200
3.003	19.404	40.5	S18	208.031	204.867	2.939	Open Manhole	1500
3.004	19.154	504.1	S19	207.827	204.454	2.773	Open Manhole	1500
3.005	27.968	499.4	S20	207.532	204.398	2.534	Open Manhole	1500
3.006	23.231	341.6	S7	207.324	204.330	2.394	Open Manhole	2400
1.006	58.525	500.2	FCC	206.073	203.634	1.239	Open Manhole	3000

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PIPELINE SCHEDULES for STORM 27.01.23.SWS

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)
4.000	o	225	S21	208.364	207.000	1.139	Open Manhole	1200
4.001	o	225	S22	208.163	206.925	1.013	Open Manhole	1200
4.002	o	225	S23	207.304	205.968	1.111	Open Manhole	1200
4.003	o	225	S24	206.885	205.125	1.535	Open Manhole	1200
4.004	o	1200	S25	206.589	203.700	1.689	Open Manhole	2100
1.007	o	225	FCC	206.073	203.634	2.214	Open Manhole	3000

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)
4.000	13.044	173.9	S22	208.163	206.925	1.013	Open Manhole	1200
4.001	34.534	36.1	S23	207.304	205.968	1.111	Open Manhole	1200
4.002	16.011	19.0	S24	206.885	205.125	1.535	Open Manhole	1200
4.003	12.707	28.2	S25	206.589	204.675	1.689	Open Manhole	2100
4.004	33.111	501.7	FCC	206.073	203.634	1.239	Open Manhole	3000
1.007	24.613	10.6	10	203.500	201.310	1.965	Open Manhole	0

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Network Classifications for STORM 27.01.23.SWS

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1.000	S1	450	4.583	4.829	Unclassified	1350	0	4.829	Unclassified
1.001	S2	975	4.392	4.583	Unclassified	2100	0	4.583	Unclassified
1.002	S3	975	4.242	4.392	Unclassified	2100	0	4.392	Unclassified
1.003	S4	975	3.944	4.242	Unclassified	2100	0	4.242	Unclassified
2.000	S11	225	1.495	2.428	Unclassified	1200	0	1.495	Unclassified
2.001	S12	225	2.428	3.078	Unclassified	1200	0	2.428	Unclassified
2.002	S13	225	3.078	3.944	Unclassified	1200	0	3.078	Unclassified
1.004	S5	975	3.301	3.944	Unclassified	2400	0	3.944	Unclassified
1.005	S6	975	3.123	3.301	Unclassified	2100	0	3.301	Unclassified
3.000	S14	225	1.426	2.355	Unclassified	1200	0	1.426	Unclassified
3.001	S15	225	2.355	2.428	Unclassified	1200	0	2.355	Unclassified
3.002	S16	225	2.428	2.655	Unclassified	1200	0	2.428	Unclassified
3.003	S17	225	2.655	2.939	Unclassified	1200	0	2.655	Unclassified
3.004	S18	600	2.773	2.939	Unclassified	1500	0	2.939	Unclassified
3.005	S19	600	2.534	2.773	Unclassified	1500	0	2.773	Unclassified
3.006	S20	600	2.394	2.534	Unclassified	1500	0	2.534	Unclassified
1.006	S7	1200	1.239	2.373	Unclassified	2400	0	2.373	Unclassified
4.000	S21	225	1.013	1.155	Unclassified	1200	0	1.139	Unclassified
4.001	S22	225	1.013	1.111	Unclassified	1200	0	1.013	Unclassified
4.002	S23	225	1.111	1.535	Unclassified	1200	0	1.111	Unclassified
4.003	S24	225	1.535	1.689	Unclassified	1200	0	1.535	Unclassified
4.004	S25	1200	1.177	1.689	Unclassified	2100	0	1.689	Unclassified
1.007	FCC	225	1.943	2.214	Unclassified	3000	0	2.214	Unclassified

Free Flowing Outfall Details for STORM 27.01.23.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.007	10	203.500	201.310	0.000	0	0
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Simulation Criteria for STORM 27.01.23.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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	1
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

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<u>Synthetic Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Profile Type</td> <td>Summer</td> </tr> <tr> <td>Return Period (years)</td> <td>1</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>20.000</td> <td>Storm Duration (mins)</td> <td>30</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td></td> <td></td> </tr> </table>			Rainfall Model	FSR	Profile Type	Summer	Return Period (years)	1	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	20.000	Storm Duration (mins)	30	Ratio R	0.400		
Rainfall Model	FSR	Profile Type	Summer																			
Return Period (years)	1	Cv (Summer)	0.750																			
Region	England and Wales	Cv (Winter)	0.840																			
M5-60 (mm)	20.000	Storm Duration (mins)	30																			
Ratio R	0.400																					
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Online Controls for STORM 27.01.23.SWS

Hydro-Brake® Optimum Manhole: FCC, DS/PN: 1.007, Volume (m³): 114.9

Unit Reference	MD-SHE-0147-1160-1600-1160
Design Head (m)	1.600
Design Flow (l/s)	11.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	147
Invert Level (m)	203.634
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	11.6
Flush-Flo™	0.468	11.6
Kick-Flo®	0.991	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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.3	1.200	10.1	3.000	15.6	7.000	23.4
0.200	10.3	1.400	10.9	3.500	16.8	7.500	24.2
0.300	11.2	1.600	11.6	4.000	17.9	8.000	25.0
0.400	11.5	1.800	12.3	4.500	19.0	8.500	25.7
0.500	11.6	2.000	12.9	5.000	19.9	9.000	26.4
0.600	11.5	2.200	13.5	5.500	20.9	9.500	27.1
0.800	10.9	2.400	14.0	6.000	21.8		
1.000	9.3	2.600	14.6	6.500	22.6		

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Storage Structures for STORM 27.01.23.SWS

Tank or Pond Manhole: S2, DS/PN: 1.001

Invert Level (m) 203.960

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	370.0	0.700	370.0	1.400	0.0	2.100	0.0
0.100	370.0	0.800	370.0	1.500	0.0	2.200	0.0
0.200	370.0	0.900	370.0	1.600	0.0	2.300	0.0
0.300	370.0	1.000	370.0	1.700	0.0	2.400	0.0
0.400	370.0	1.001	0.0	1.800	0.0	2.500	0.0
0.500	370.0	1.200	0.0	1.900	0.0		
0.600	370.0	1.300	0.0	2.000	0.0		

Manhole Headloss for STORM 27.01.23.SWS

PN	US/MH	US/MH
Name	Headloss	
1.000	S1	0.500
1.001	S2	0.500
1.002	S3	0.500
1.003	S4	0.500
2.000	S11	0.500
2.001	S12	0.500
2.002	S13	0.500
1.004	S5	0.500
1.005	S6	0.500
3.000	S14	0.500
3.001	S15	0.500
3.002	S16	0.500
3.003	S17	0.500
3.004	S18	0.500
3.005	S19	0.500
3.006	S20	0.500
1.006	S7	0.500
4.000	S21	0.500
4.001	S22	0.500
4.002	S23	0.500
4.003	S24	0.500
4.004	S25	0.500
1.007	FCC	0.500

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

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 Storage Structures 1
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 0.400
Region England and Wales Cv (Summer)	0.750	
M5-60 (mm)	20.000 Cv (Winter)	0.840

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

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440	Summer and Winter
Return Period(s) (years) 1, 30, 40, 50, 60, 70, 100	
Climate Change (%) 0, 0, 0, 0, 0, 0, 40	

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	15 Winter	1	+0%	60/120 Winter				204.057
1.001	S2	120 Winter	1	+0%	50/120 Winter				204.007
1.002	S3	120 Winter	1	+0%	40/240 Winter				204.008
1.003	S4	120 Winter	1	+0%	40/120 Winter				204.007
2.000	S11	15 Winter	1	+0%					207.318
2.001	S12	15 Winter	1	+0%					206.252
2.002	S13	15 Winter	1	+0%					205.391
1.004	S5	120 Winter	1	+0%	30/120 Winter				204.008
1.005	S6	120 Winter	1	+0%	30/15 Winter				204.006
3.000	S14	15 Winter	1	+0%					207.246
3.001	S15	15 Winter	1	+0%	100/15 Summer				206.080
3.002	S16	15 Winter	1	+0%	70/15 Summer				205.736
3.003	S17	15 Winter	1	+0%	40/15 Summer				205.436
3.004	S18	15 Winter	1	+0%					204.661
3.005	S19	15 Winter	1	+0%					204.616
3.006	S20	15 Winter	1	+0%					204.546
1.006	S7	120 Winter	1	+0%					204.006
4.000	S21	15 Summer	1	+0%					207.071
4.001	S22	15 Winter	1	+0%					206.985

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PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	-0.364	0.000	0.08		7.3	OK	
1.001	S2	-0.384	0.000	0.03		13.0	OK	
1.002	S3	-0.358	0.000	0.02		10.6	OK	
1.003	S4	-0.338	0.000	0.02		11.4	OK	
2.000	S11	-0.187	0.000	0.07		7.3	OK	
2.001	S12	-0.173	0.000	0.12		13.1	OK	
2.002	S13	-0.160	0.000	0.18		18.9	OK	
1.004	S5	-0.303	0.000	0.01		9.3	OK	
1.005	S6	-0.216	0.000	0.02		9.9	OK	
3.000	S14	-0.186	0.000	0.07		7.3	OK	
3.001	S15	-0.153	0.000	0.22		13.1	OK	
3.002	S16	-0.151	0.000	0.24		18.9	OK	
3.003	S17	-0.135	0.000	0.33		24.5	OK	
3.004	S18	-0.431	0.000	0.15		30.2	OK	
3.005	S19	-0.438	0.000	0.14		34.9	OK	
3.006	S20	-0.452	0.000	0.14		39.9	OK	
1.006	S7	-0.945	0.000	0.01		19.2	OK	
4.000	S21	-0.154	0.000	0.22		7.3	OK	
4.001	S22	-0.165	0.000	0.16		13.0	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	1	+0%	100/15 Summer				206.032
4.003	S24	15 Winter	1	+0%	100/15 Summer				205.208
4.004	S25	120 Winter	1	+0%	100/240 Winter				204.005
1.007	FCC	120 Winter	1	+0%	1/15 Summer				204.005

US/MH		Surcharged Flooded		Flow / Overflow		Pipe	Level	
PN	Name	Depth (m)	Volume (m³)	Cap.	(l/s)	Flow (l/s)	Status	Exceeded
4.002	S23	-0.161	0.000	0.18		18.7	OK	
4.003	S24	-0.142	0.000	0.29		24.5	OK	
4.004	S25	-0.895	0.000	0.01		10.4	OK	
1.007	FCC	0.146	0.000	0.08		11.5	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

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 Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

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 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 40, 50, 60, 70, 100

Climate Change (%) 0, 0, 0, 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	30	+0%	60/120 Winter				204.328
1.001	S2	240 Winter	30	+0%	50/120 Winter				204.329
1.002	S3	240 Winter	30	+0%	40/240 Winter				204.328
1.003	S4	240 Winter	30	+0%	40/120 Winter				204.328
2.000	S11	15 Winter	30	+0%					207.341
2.001	S12	15 Winter	30	+0%					206.290
2.002	S13	15 Summer	30	+0%					205.442
1.004	S5	240 Winter	30	+0%	30/120 Winter				204.327
1.005	S6	240 Winter	30	+0%	30/15 Winter				204.327
3.000	S14	15 Winter	30	+0%					207.270
3.001	S15	15 Summer	30	+0%	100/15 Summer				206.135
3.002	S16	15 Summer	30	+0%	70/15 Summer				205.799
3.003	S17	15 Summer	30	+0%	40/15 Summer				205.523
3.004	S18	15 Winter	30	+0%					204.792
3.005	S19	15 Winter	30	+0%					204.739
3.006	S20	15 Winter	30	+0%					204.663
1.006	S7	240 Winter	30	+0%					204.327
4.000	S21	15 Summer	30	+0%					207.116
4.001	S22	15 Summer	30	+0%					207.029

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	-0.093	0.000	0.03		3.0	OK	
1.001	S2	-0.062	0.000	0.03		11.9	OK	
1.002	S3	-0.038	0.000	0.03		12.0	OK	
1.003	S4	-0.017	0.000	0.02		10.0	OK	
2.000	S11	-0.164	0.000	0.16		17.9	OK	
2.001	S12	-0.135	0.000	0.34		35.9	OK	
2.002	S13	-0.109	0.000	0.52		53.8	OK	
1.004	S5	0.016	0.000	0.01		9.6	SURCHARGED	
1.005	S6	0.105	0.000	0.03		11.1	SURCHARGED	
3.000	S14	-0.162	0.000	0.17		17.9	OK	
3.001	S15	-0.098	0.000	0.61		35.9	OK	
3.002	S16	-0.088	0.000	0.68		53.9	OK	
3.003	S17	-0.048	0.000	0.97		71.8	OK	
3.004	S18	-0.300	0.000	0.44		87.3	OK	
3.005	S19	-0.315	0.000	0.41		102.1	OK	
3.006	S20	-0.335	0.000	0.40		114.9	OK	
1.006	S7	-0.624	0.000	0.01		16.4	OK	
4.000	S21	-0.109	0.000	0.53		17.9	OK	
4.001	S22	-0.121	0.000	0.44		35.8	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	30	+0%	100/15 Summer				206.081
4.003	S24	15 Winter	30	+0%	100/15 Summer				205.284
4.004	S25	60 Winter	30	+0%	100/240 Winter				204.329
1.007	FCC	240 Winter	30	+0%	1/15 Summer				204.325

		Surcharged	Flooded				Pipe		
	US/MH	Depth	Volume	Flow /	Overflow	Flow		Level	
PN	Name	(m)	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded	
4.002	S23	-0.112	0.000	0.51		53.6	OK		
4.003	S24	-0.066	0.000	0.84		71.3	OK		
4.004	S25	-0.571	0.000	0.03		41.4	OK		
1.007	FCC	0.466	0.000	0.08		11.6	SURCHARGED		

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40 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

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 Storage Structures 1

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 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 40, 50, 60, 70, 100

Climate Change (%) 0, 0, 0, 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	40	+0%	60/120 Winter				204.375
1.001	S2	240 Winter	40	+0%	50/120 Winter				204.375
1.002	S3	240 Winter	40	+0%	40/240 Winter				204.376
1.003	S4	240 Winter	40	+0%	40/120 Winter				204.376
2.000	S11	15 Winter	40	+0%					207.343
2.001	S12	15 Winter	40	+0%					206.293
2.002	S13	15 Summer	40	+0%					205.446
1.004	S5	240 Winter	40	+0%	30/120 Winter				204.376
1.005	S6	240 Winter	40	+0%	30/15 Winter				204.375
3.000	S14	15 Winter	40	+0%					207.272
3.001	S15	15 Summer	40	+0%	100/15 Summer				206.140
3.002	S16	15 Summer	40	+0%	70/15 Summer				205.806
3.003	S17	15 Summer	40	+0%	40/15 Summer				205.589
3.004	S18	15 Winter	40	+0%					204.800
3.005	S19	15 Winter	40	+0%					204.748
3.006	S20	15 Winter	40	+0%					204.672
1.006	S7	240 Winter	40	+0%					204.375
4.000	S21	15 Summer	40	+0%					207.121
4.001	S22	15 Summer	40	+0%					207.033

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40 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	-0.046	0.000	0.04		3.2	OK	
1.001	S2	-0.016	0.000	0.03		12.5	OK	
1.002	S3	0.010	0.000	0.03		12.2	SURCHARGED	
1.003	S4	0.031	0.000	0.02		9.6	SURCHARGED	
2.000	S11	-0.162	0.000	0.17		19.1	OK	
2.001	S12	-0.132	0.000	0.36		38.2	OK	
2.002	S13	-0.105	0.000	0.56		57.3	OK	
1.004	S5	0.065	0.000	0.01		9.9	SURCHARGED	
1.005	S6	0.153	0.000	0.03		11.8	SURCHARGED	
3.000	S14	-0.160	0.000	0.18		19.1	OK	
3.001	S15	-0.093	0.000	0.65		38.2	OK	
3.002	S16	-0.081	0.000	0.72		57.4	OK	
3.003	S17	0.018	0.000	1.01		74.3	SURCHARGED	
3.004	S18	-0.292	0.000	0.46		92.1	OK	
3.005	S19	-0.306	0.000	0.44		107.7	OK	
3.006	S20	-0.326	0.000	0.42		122.1	OK	
1.006	S7	-0.576	0.000	0.01		16.4	OK	
4.000	S21	-0.104	0.000	0.56		19.1	OK	
4.001	S22	-0.117	0.000	0.47		38.1	OK	

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Innovyze	Network 2019.1	

40 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	40	+0%	100/15 Summer				206.086
4.003	S24	15 Winter	40	+0%	100/15 Summer				205.292
4.004	S25	240 Winter	40	+0%	100/240 Winter				204.372
1.007	FCC	240 Winter	40	+0%	1/15 Summer				204.372

US/MH		Surcharged	Flooded	Pipe		Level	
PN	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status Exceeded
4.002	S23	-0.107	0.000	0.54		57.1	OK
4.003	S24	-0.058	0.000	0.90		75.8	OK
4.004	S25	-0.528	0.000	0.01		16.4	OK
1.007	FCC	0.513	0.000	0.08		11.6	SURCHARGED

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50 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

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 Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500	Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000	

Number of Input Hydrographs 0	Number of Storage Structures 1
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 0.400
Region England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000 Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440	
Return Period(s) (years) 1, 30, 40, 50, 60, 70, 100	
Climate Change (%) 0, 0, 0, 0, 0, 0, 40	

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	50	+0%	60/120 Winter				204.413
1.001	S2	240 Winter	50	+0%	50/120 Winter				204.413
1.002	S3	240 Winter	50	+0%	40/240 Winter				204.415
1.003	S4	240 Winter	50	+0%	40/120 Winter				204.415
2.000	S11	15 Winter	50	+0%					207.345
2.001	S12	15 Winter	50	+0%					206.295
2.002	S13	15 Summer	50	+0%					205.450
1.004	S5	240 Winter	50	+0%	30/120 Winter				204.414
1.005	S6	240 Winter	50	+0%	30/15 Winter				204.414
3.000	S14	15 Winter	50	+0%					207.274
3.001	S15	15 Summer	50	+0%	100/15 Summer				206.145
3.002	S16	15 Winter	50	+0%	70/15 Summer				205.817
3.003	S17	15 Summer	50	+0%	40/15 Summer				205.639
3.004	S18	15 Winter	50	+0%					204.808
3.005	S19	15 Winter	50	+0%					204.755
3.006	S20	15 Winter	50	+0%					204.679
1.006	S7	240 Winter	50	+0%					204.414
4.000	S21	15 Summer	50	+0%					207.124
4.001	S22	15 Summer	50	+0%					207.036

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50 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	-0.008	0.000	0.04		3.4	OK	
1.001	S2	0.022	0.000	0.02		11.1	SURCHARGED	
1.002	S3	0.049	0.000	0.03		12.0	SURCHARGED	
1.003	S4	0.070	0.000	0.02		12.0	SURCHARGED	
2.000	S11	-0.160	0.000	0.18		20.0	OK	
2.001	S12	-0.130	0.000	0.38		40.1	OK	
2.002	S13	-0.101	0.000	0.58		60.1	OK	
1.004	S5	0.103	0.000	0.01		9.8	SURCHARGED	
1.005	S6	0.192	0.000	0.03		11.4	SURCHARGED	
3.000	S14	-0.158	0.000	0.19		20.0	OK	
3.001	S15	-0.088	0.000	0.68		40.1	OK	
3.002	S16	-0.070	0.000	0.76		59.9	OK	
3.003	S17	0.068	0.000	1.05		77.7	SURCHARGED	
3.004	S18	-0.284	0.000	0.49		96.6	OK	
3.005	S19	-0.299	0.000	0.46		112.4	OK	
3.006	S20	-0.319	0.000	0.44		127.8	OK	
1.006	S7	-0.537	0.000	0.01		16.5	OK	
4.000	S21	-0.101	0.000	0.59		20.0	OK	
4.001	S22	-0.114	0.000	0.49		40.0	OK	

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50 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	50	+0%	100/15 Summer				206.089
4.003	S24	15 Winter	50	+0%	100/15 Summer				205.298
4.004	S25	240 Winter	50	+0%	100/240 Winter				204.411
1.007	FCC	240 Winter	50	+0%	1/15 Summer				204.411

US/MH		Surcharged Flooded		Pipe		Level	
PN	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status Exceeded
4.002	S23	-0.104	0.000	0.56		59.9	OK
4.003	S24	-0.052	0.000	0.94		79.6	OK
4.004	S25	-0.489	0.000	0.01		17.2	OK
1.007	FCC	0.552	0.000	0.08		11.6	SURCHARGED

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The Custard Factory, Gibb St...

Birmingham, B9 4AA

BOLEYN ROAD

REDNAL

BIRMINGHAM

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

for STORM 27.01.23.SWS

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 Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

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 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm)

20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

ON

Inertia Status

ON

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years)

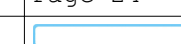
1, 30, 40, 50, 60, 70, 100

Climate Change (%)

0, 0, 0, 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	60	+0%	60/120 Winter				204.446
1.001	S2	240 Winter	60	+0%	50/120 Winter				204.446
1.002	S3	240 Winter	60	+0%	40/240 Winter				204.447
1.003	S4	240 Winter	60	+0%	40/120 Winter				204.448
2.000	S11	15 Winter	60	+0%					207.346
2.001	S12	15 Winter	60	+0%					206.297
2.002	S13	15 Summer	60	+0%					205.453
1.004	S5	240 Winter	60	+0%	30/120 Winter				204.447
1.005	S6	240 Winter	60	+0%	30/15 Winter				204.447
3.000	S14	15 Winter	60	+0%					207.275
3.001	S15	15 Winter	60	+0%	100/15 Summer				206.148
3.002	S16	15 Winter	60	+0%	70/15 Summer				205.856
3.003	S17	15 Winter	60	+0%	40/15 Summer				205.663
3.004	S18	15 Winter	60	+0%					204.814
3.005	S19	15 Winter	60	+0%					204.761
3.006	S20	15 Winter	60	+0%					204.685
1.006	S7	240 Winter	60	+0%					204.447
4.000	S21	15 Summer	60	+0%					207.127
4.001	S22	15 Summer	60	+0%					207.039

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60 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	0.025	0.000	0.04		3.5	SURCHARGED	
1.001	S2	0.055	0.000	0.02		11.1	SURCHARGED	
1.002	S3	0.081	0.000	0.03		12.0	SURCHARGED	
1.003	S4	0.103	0.000	0.02		13.1	SURCHARGED	
2.000	S11	-0.159	0.000	0.19		20.8	OK	
2.001	S12	-0.128	0.000	0.39		41.7	OK	
2.002	S13	-0.098	0.000	0.61		62.5	OK	
1.004	S5	0.136	0.000	0.01		10.5	SURCHARGED	
1.005	S6	0.225	0.000	0.03		12.3	SURCHARGED	
3.000	S14	-0.157	0.000	0.20		20.8	OK	
3.001	S15	-0.085	0.000	0.71		41.7	OK	
3.002	S16	-0.031	0.000	0.76		60.4	OK	
3.003	S17	0.092	0.000	1.09		80.6	SURCHARGED	
3.004	S18	-0.278	0.000	0.50		99.4	OK	
3.005	S19	-0.293	0.000	0.47		115.9	OK	
3.006	S20	-0.313	0.000	0.46		132.0	OK	
1.006	S7	-0.504	0.000	0.01		16.4	OK	
4.000	S21	-0.098	0.000	0.61		20.8	OK	
4.001	S22	-0.111	0.000	0.51		41.6	OK	

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60 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	60	+0%	100/15 Summer				206.092
4.003	S24	15 Winter	60	+0%	100/15 Summer				205.303
4.004	S25	240 Winter	60	+0%	100/240 Winter				204.444
1.007	FCC	240 Winter	60	+0%	1/15 Summer				204.444

US/MH		Surcharged Flooded		Pipe		Level	
PN	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status Exceeded
4.002	S23	-0.101	0.000	0.59		62.3	OK
4.003	S24	-0.047	0.000	0.98		82.8	OK
4.004	S25	-0.456	0.000	0.01		17.9	OK
1.007	FCC	0.585	0.000	0.08		11.6	SURCHARGED

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Studio 313 Scott House
The Custard Factory, Gibb St...
Birmingham, B9 4AA

BOLEYN ROAD
REDNAL
BIRMINGHAM

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70 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

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 Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

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 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm)

20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

ON

Inertia Status

ON

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 40, 50, 60, 70, 100

Climate Change (%) 0, 0, 0, 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	240 Winter	70	+0%	60/120 Winter				204.476
1.001	S2	240 Winter	70	+0%	50/120 Winter				204.476
1.002	S3	240 Winter	70	+0%	40/240 Winter				204.476
1.003	S4	240 Winter	70	+0%	40/120 Winter				204.476
2.000	S11	15 Winter	70	+0%					207.347
2.001	S12	15 Winter	70	+0%					206.299
2.002	S13	15 Summer	70	+0%					205.455
1.004	S5	240 Winter	70	+0%	30/120 Winter				204.476
1.005	S6	240 Winter	70	+0%	30/15 Winter				204.476
3.000	S14	15 Winter	70	+0%					207.276
3.001	S15	15 Winter	70	+0%	100/15 Summer				206.152
3.002	S16	15 Winter	70	+0%	70/15 Summer				205.890
3.003	S17	15 Winter	70	+0%	40/15 Summer				205.690
3.004	S18	15 Winter	70	+0%					204.818
3.005	S19	15 Winter	70	+0%					204.766
3.006	S20	15 Winter	70	+0%					204.689
1.006	S7	240 Winter	70	+0%					204.476
4.000	S21	15 Summer	70	+0%					207.130
4.001	S22	15 Summer	70	+0%					207.041

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70 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	0.055	0.000	0.04		3.6	SURCHARGED	
1.001	S2	0.085	0.000	0.03		12.3	SURCHARGED	
1.002	S3	0.110	0.000	0.03		12.2	SURCHARGED	
1.003	S4	0.131	0.000	0.02		11.7	SURCHARGED	
2.000	S11	-0.158	0.000	0.20		21.5	OK	
2.001	S12	-0.126	0.000	0.40		43.1	OK	
2.002	S13	-0.096	0.000	0.63		64.6	OK	
1.004	S5	0.165	0.000	0.01		10.5	SURCHARGED	
1.005	S6	0.254	0.000	0.03		11.3	SURCHARGED	
3.000	S14	-0.156	0.000	0.21		21.5	OK	
3.001	S15	-0.081	0.000	0.73		43.1	OK	
3.002	S16	0.003	0.000	0.78		62.2	SURCHARGED	
3.003	S17	0.119	0.000	1.12		82.5	SURCHARGED	
3.004	S18	-0.274	0.000	0.51		101.8	OK	
3.005	S19	-0.288	0.000	0.48		118.8	OK	
3.006	S20	-0.309	0.000	0.47		135.4	OK	
1.006	S7	-0.475	0.000	0.01		16.3	OK	
4.000	S21	-0.095	0.000	0.63		21.6	OK	
4.001	S22	-0.109	0.000	0.53		43.0	OK	

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70 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for STORM 27.01.23.SWS

US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	70	+0%	100/15 Summer				206.095
4.003	S24	15 Winter	70	+0%	100/15 Summer				205.342
4.004	S25	240 Winter	70	+0%	100/240 Winter				204.473
1.007	FCC	240 Winter	70	+0%	1/15 Summer				204.473

US/MH		Surcharged Flooded		Pipe		Level	
PN	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status Exceeded
4.002	S23	-0.098	0.000	0.61		64.4	OK
4.003	S24	-0.008	0.000	1.00		84.4	OK
4.004	S25	-0.427	0.000	0.01		18.6	OK
1.007	FCC	0.614	0.000	0.08		11.6	SURCHARGED

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Studio 313 Scott House

The Custard Factory, Gibb St...

Birmingham, B9 4AA

BOLEYN ROAD

REDNAL

BIRMINGHAM

Date 01/01/0001

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Network 2019.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for STORM 27.01.23.SWS

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 Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

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 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm)

20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

ON

Inertia Status

ON

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years)

1, 30, 40, 50, 60, 70, 100

Climate Change (%)

0, 0, 0, 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	360 Winter	100	+40%	60/120 Winter				204.946
1.001	S2	360 Winter	100	+40%	50/120 Winter				204.946
1.002	S3	360 Winter	100	+40%	40/240 Winter				204.947
1.003	S4	360 Winter	100	+40%	40/120 Winter				204.951
2.000	S11	15 Winter	100	+40%					207.364
2.001	S12	15 Winter	100	+40%					206.327
2.002	S13	15 Summer	100	+40%					205.499
1.004	S5	360 Winter	100	+40%	30/120 Winter				204.952
1.005	S6	360 Winter	100	+40%	30/15 Winter				204.952
3.000	S14	15 Winter	100	+40%					207.293
3.001	S15	15 Winter	100	+40%	100/15 Summer				206.880
3.002	S16	15 Winter	100	+40%	70/15 Summer				206.556
3.003	S17	15 Winter	100	+40%	40/15 Summer				206.195
3.004	S18	240 Winter	100	+40%					204.959
3.005	S19	240 Winter	100	+40%					204.957
3.006	S20	240 Winter	100	+40%					204.954
1.006	S7	360 Winter	100	+40%					204.951
4.000	S21	15 Summer	100	+40%					207.175
4.001	S22	15 Summer	100	+40%					207.078

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Innovyze	Network 2019.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for STORM 27.01.23.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	S1	0.525	0.000	0.05		4.0	SURCHARGED	
1.001	S2	0.555	0.000	0.08		36.0	SURCHARGED	
1.002	S3	0.581	0.000	0.08		34.4	SURCHARGED	
1.003	S4	0.606	0.000	0.05		30.2	SURCHARGED	
2.000	S11	-0.141	0.000	0.30		32.6	OK	
2.001	S12	-0.098	0.000	0.61		65.2	OK	
2.002	S13	-0.052	0.000	0.95		97.8	OK	
1.004	S5	0.641	0.000	0.02		19.3	SURCHARGED	
1.005	S6	0.730	0.000	0.04		17.6	SURCHARGED	
3.000	S14	-0.139	0.000	0.32		32.6	OK	
3.001	S15	0.647	0.000	0.97		56.9	SURCHARGED	
3.002	S16	0.669	0.000	1.07		84.4	SURCHARGED	
3.003	S17	0.624	0.000	1.51		111.9	SURCHARGED	
3.004	S18	-0.133	0.000	0.15		29.0	OK	
3.005	S19	-0.097	0.000	0.14		34.8	OK	
3.006	S20	-0.044	0.000	0.14		40.5	OK	
1.006	S7	0.000	0.000	0.01		14.6	OK	
4.000	S21	-0.050	0.000	0.96		32.6	OK	
4.001	S22	-0.072	0.000	0.79		65.0	OK	

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Innovyze	Network 2019.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for STORM 27.01.23.SWS

US/MH		Return Climate		First (X)		First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
4.002	S23	15 Winter	100	+40%	100/15 Summer				206.437
4.003	S24	15 Winter	100	+40%	100/15 Summer				205.805
4.004	S25	240 Winter	100	+40%	100/240 Winter				204.923
1.007	FCC	240 Winter	100	+40%	1/15 Summer				204.923

US/MH		Surcharged Flooded		Pipe		Level	
PN	Name	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status Exceeded
4.002	S23	0.244	0.000	0.86		91.6	SURCHARGED
4.003	S24	0.455	0.000	1.42		120.0	SURCHARGED
4.004	S25	0.023	0.000	0.02		28.2	SURCHARGED
1.007	FCC	1.064	0.000	0.08		11.6	SURCHARGED