

Bradbrook Consulting		Page 1
Blackfriars Office 240 Blackfriars Road London, SE1 8NW	Silverdale Road, Hayes Network 1 Buildings A and B	
Date 07/10/2020 16:59 File Network-1.MDX	Designed by MS Checked by RM	
Innovyze		Network 2020.1

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.196	4-8	0.033

Total Area Contributing (ha) = 0.229

Total Pipe Volume (m³) = 1.363

Existing Network Details 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
S1.000	6.400	0.040	160.0	0.062	4.00	0.0	0.600	o	150	Pipe/Conduit
S1.001	4.400	0.100	44.0	0.036	0.00	0.0	0.600	o	150	Pipe/Conduit
S2.000	3.000	0.400	7.5	0.006	4.00	0.0	0.600	o	150	Pipe/Conduit
S2.001	3.000	0.100	30.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
S3.000	4.100	0.100	41.0	0.017	4.00	0.0	0.600	o	150	Pipe/Conduit
S4.000	6.200	0.100	62.0	0.056	4.00	0.0	0.600	o	150	Pipe/Conduit
S5.000	9.100	1.200	7.6	0.024	4.00	0.0	0.600	o	150	Pipe/Conduit
S5.001	6.300	0.040	157.5	0.028	0.00	0.0	0.600	o	150	Pipe/Conduit
S5.002	8.900	0.070	127.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
S1.002	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
S1.003	20.300	-2.030	-10.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	29.040	0.062	0.0	0.79	14.0
S1.001	29.000	0.098	0.0	1.52	26.9
S2.000	29.400	0.006	0.0	3.70	65.4
S2.001	29.000	0.006	0.0	1.84	32.6
S3.000	29.000	0.017	0.0	1.58	27.9
S4.000	29.000	0.056	0.0	1.28	22.6
S5.000	30.200	0.024	0.0	3.68	65.1
S5.001	29.000	0.052	0.0	0.80	14.1
S5.002	28.960	0.052	0.0	0.89	15.7
S1.002	28.400	0.229	0.0	1.31	52.0
S1.003	28.390	0.229	0.0	0.00	0.0

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Existing Network Details 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
S1.004	3.200	0.020	160.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.004	30.420	0.229	0.0	0.79	14.0

Manhole Schedules for Storm											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SSP1	34.400	5.360	Open Manhole	1200	S1.000	29.040	150				
SS101	30.200	1.200	Open Manhole	1200	S1.001	29.000	150	S1.000	29.000	150	
SSP2	30.200	0.800	Open Manhole	1200	S2.000	29.400	150				
SS102	30.200	1.200	Open Manhole	1200	S2.001	29.000	150	S2.000	29.000	150	
SS103	30.200	1.200	Open Manhole	1200	S3.000	29.000	150				
SS105	30.200	1.200	Open Manhole	1200	S4.000	29.000	150				
SSP3	31.000	0.800	Open Manhole	1200	S5.000	30.200	150				
SS106	30.200	1.200	Open Manhole	1200	S5.001	29.000	150	S5.000	29.000	150	
SS107	30.200	1.240	Open Manhole	1200	S5.002	28.960	150	S5.001	28.960	150	
STANK 1	30.200	1.800	Open Manhole	1200	S1.002	28.400	225	S1.001	28.900	150	425
								S2.001	28.900	150	425
								S3.000	28.900	150	425
								S4.000	28.900	150	425
								S5.002	28.890	150	415
SPS1	30.200	1.810	Open Manhole	1200	S1.003	28.390	150	S1.002	28.390	225	
SS108	31.200	0.780	Open Manhole	1200	S1.004	30.420	150	S1.003	30.420	150	
S	31.280	0.880	Open Manhole	0		OUTFALL		S1.004	30.400	150	

No coordinates have been specified, layout information cannot be produced.

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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	SSP1	34.400	29.040	5.210	Open Manhole	1200
S1.001	o	150	SS101	30.200	29.000	1.050	Open Manhole	1200
S2.000	o	150	SSP2	30.200	29.400	0.650	Open Manhole	1200
S2.001	o	150	SS102	30.200	29.000	1.050	Open Manhole	1200
S3.000	o	150	SS103	30.200	29.000	1.050	Open Manhole	1200
S4.000	o	150	SS105	30.200	29.000	1.050	Open Manhole	1200
S5.000	o	150	SSP3	31.000	30.200	0.650	Open Manhole	1200
S5.001	o	150	SS106	30.200	29.000	1.050	Open Manhole	1200
S5.002	o	150	SS107	30.200	28.960	1.090	Open Manhole	1200
S1.002	o	225	STANK 1	30.200	28.400	1.575	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	6.400	160.0	SS101	30.200	29.000	1.050	Open Manhole	1200
S1.001	4.400	44.0	STANK 1	30.200	28.900	1.150	Open Manhole	1200
S2.000	3.000	7.5	SS102	30.200	29.000	1.050	Open Manhole	1200
S2.001	3.000	30.0	STANK 1	30.200	28.900	1.150	Open Manhole	1200
S3.000	4.100	41.0	STANK 1	30.200	28.900	1.150	Open Manhole	1200
S4.000	6.200	62.0	STANK 1	30.200	28.900	1.150	Open Manhole	1200
S5.000	9.100	7.6	SS106	30.200	29.000	1.050	Open Manhole	1200
S5.001	6.300	157.5	SS107	30.200	28.960	1.090	Open Manhole	1200
S5.002	8.900	127.1	STANK 1	30.200	28.890	1.160	Open Manhole	1200
S1.002	1.000	100.0	SPS1	30.200	28.390	1.585	Open Manhole	1200

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)
S1.003	o	150	SPS1	30.200	28.390	1.660	Open Manhole	1200
S1.004	o	150	SS108	31.200	30.420	0.630	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)
S1.003	20.300	-10.0	SS108	31.200	30.420	0.630	Open Manhole	1200
S1.004	3.200	160.0	S	31.280	30.400	0.730	Open Manhole	0

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)
S1.004	S	31.280	30.400	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000	Cv (Summer)	0.750
Return Period (years)	100	Ratio R	0.408	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer Storm	Duration (mins)	30

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Online Controls for Storm

Pump Manhole: SPS1, DS/PN: S1.003, Volume (m³): 2.0

Invert Level (m) 28.390

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)
0.200	3.0000	0.400	3.0000	0.600	3.0000	0.800	3.0000	1.000	3.0000

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Storage Structures for Storm

Cellular Storage Manhole: STANK 1, DS/PN: S1.002

Invert Level (m) 28.400 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	190.0	0.0	1.000	190.0	0.0	1.001	0.0	0.0

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	20.000	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.411	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	2.5 Second Increment (Extended)	Inertia Status	OFF
DTS 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 (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Half Drain Time	Pipe Flow	Status	Level Exceeded
									Level (m)	Depth (m)	Volume (m³)		(l/s)	(mins)	(l/s)		
S1.000	SSP1	15 Summer	1	+0%	30/15 Summer				29.141	-0.049	0.000	0.79			9.3	OK	
S1.001	SS101	15 Winter	1	+0%	30/15 Summer				29.092	-0.058	0.000	0.69			13.6	OK	
S2.000	SSP2	15 Summer	1	+0%					29.415	-0.135	0.000	0.02			0.9	OK	
S2.001	SS102	15 Winter	1	+0%					29.020	-0.130	0.000	0.05			0.9	OK	
S3.000	SS103	15 Summer	1	+0%					29.036	-0.114	0.000	0.13			2.6	OK	
S4.000	SS105	15 Summer	1	+0%	30/15 Summer				29.070	-0.080	0.000	0.45			8.4	OK	
S5.000	SSP3	15 Winter	1	+0%					30.224	-0.126	0.000	0.06			3.6	OK	
S5.001	SS106	15 Winter	1	+0%	30/15 Summer				29.083	-0.067	0.000	0.58			6.9	OK	
S5.002	SS107	15 Winter	1	+0%	30/15 Summer				29.036	-0.074	0.000	0.50			6.9	OK	
S1.002	STANK 1	180 Winter	1	+0%	30/30 Winter				28.526	-0.099	0.000	0.07		155	2.1	OK	
S1.003	SPS1	120 Winter	1	+0%	1/120 Winter				28.544	0.004	0.000	0.51			2.1	SURCHARGED	
S1.004	SS108	180 Winter	1	+0%					30.466	-0.104	0.000	0.20			2.1	OK	

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

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details
Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.411 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS 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 (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Half Drain Time	Pipe Flow	Status	Level Exceeded
									Level (m)	Depth (m)	Volume (m³)		(l/s)	(mins)	(l/s)		
S1.000	SSP1	15 Winter	30	+0%	30/15 Summer				29.498	0.308	0.000	1.84			21.7	SURCHARGED	
S1.001	SS101	15 Winter	30	+0%	30/15 Summer				29.355	0.205	0.000	1.73			34.2	SURCHARGED	
S2.000	SSP2	15 Winter	30	+0%					29.423	-0.127	0.000	0.06			2.2	OK	
S2.001	SS102	15 Summer	30	+0%					29.034	-0.116	0.000	0.11			2.2	OK	
S3.000	SS103	15 Summer	30	+0%					29.058	-0.092	0.000	0.32			6.3	OK	
S4.000	SS105	15 Winter	30	+0%	30/15 Summer				29.162	0.012	0.000	1.08			20.4	SURCHARGED	
S5.000	SSP3	15 Winter	30	+0%					30.239	-0.111	0.000	0.15			8.9	OK	
S5.001	SS106	15 Winter	30	+0%	30/15 Summer				29.261	0.111	0.000	1.56			18.4	SURCHARGED	
S5.002	SS107	15 Winter	30	+0%	30/15 Summer				29.160	0.050	0.000	1.34			18.5	SURCHARGED	
S1.002	STANK 1	180 Winter	30	+0%	30/30 Winter				28.718	0.093	0.000	0.13		174	4.0	SURCHARGED	
S1.003	SPS1	240 Winter	30	+0%	1/120 Winter				28.761	0.221	0.000	0.73			3.0	SURCHARGED	
S1.004	SS108	120 Winter	30	+0%					30.475	-0.095	0.000	0.29			3.0	OK	

Silverdale Road, Hayes
Network 1 Buildings A and B



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Network 2020.1

Simulation Criteria

Synthetic Rainfall Details

									Water	Surcharged	Flooded	Half Drain			Pipe		
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow		Level
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(1/s)	(mins)	(1/s)	Status	Exceeded
S1.000	SSP1	15 Winter	100	+0%	30/15 Summer				29.776	0.586	0.000	2.33			27.5	SURCHARGED	
S1.001	SS101	15 Winter	100	+0%	30/15 Summer				29.544	0.394	0.000	2.21			43.7	SURCHARGED	
S2.000	SSP2	15 Winter	100	+0%					29.426	-0.124	0.000	0.07			2.9		OK
S2.001	SS102	15 Summer	100	+0%					29.038	-0.112	0.000	0.15			2.9		OK
S3.000	SS103	15 Winter	100	+0%					29.067	-0.083	0.000	0.41			8.2		OK
S4.000	SS105	15 Winter	100	+0%	30/15 Summer				29.243	0.093	0.000	1.40			26.6	SURCHARGED	
S5.000	SSP3	15 Winter	100	+0%					30.245	-0.105	0.000	0.20			11.5		OK
S5.001	SS106	15 Winter	100	+0%	30/15 Summer				29.407	0.257	0.000	1.98			23.4	SURCHARGED	
S5.002	SS107	15 Winter	100	+0%	30/15 Summer				29.240	0.130	0.000	1.71			23.7	SURCHARGED	
S1.002	STANK 1	180 Winter	100	+0%	30/30 Winter				28.843	0.218	0.000	0.13			3.9	SURCHARGED	
S1.003	SPS1	180 Winter	100	+0%	1/120 Winter				28.885	0.345	0.000	0.73			3.0	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm																	
US/MH			Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded	
PN	Name	Storm							Level (m)	Depth (m)	Volume (m³)		Time (mins)	Flow (l/s)			
S1.004	SS108	600 Winter	100	+0%					30.475	-0.095	0.000	0.29		3.0	OK		

Silverdale Road, Hayes
Network 1 Buildings A and B

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									Water	Surcharged	Flooded	Half Drain		Pipe			
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow	Level	
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status	Exceeded
S1.000	SSP1	15 Winter	100	+40%	100/15 Summer				30.367	1.177	0.000	3.18			37.5	SURCHARGED	
S1.001	SS101	15 Winter	100	+40%	100/15 Summer				29.941	0.791	0.000	2.98			59.0	FLOOD RISK	
S2.000	SSP2	15 Winter	100	+40%					29.432	-0.118	0.000	0.10			4.0		OK
S2.001	SS102	240 Winter	100	+40%					29.059	-0.091	0.000	0.04			0.7		OK
S3.000	SS103	15 Winter	100	+40%					29.082	-0.068	0.000	0.58			11.4		OK
S4.000	SS105	15 Winter	100	+40%	100/15 Summer				29.430	0.280	0.000	1.93			36.6	SURCHARGED	
S5.000	SSP3	15 Winter	100	+40%					30.254	-0.096	0.000	0.28			16.1		OK
S5.001	SS106	15 Winter	100	+40%	100/15 Summer				29.720	0.570	0.000	2.70			32.0	SURCHARGED	
S5.002	SS107	15 Winter	100	+40%	100/15 Summer				29.410	0.300	0.000	2.33			32.2	SURCHARGED	
S1.002	STANK 1	240 Winter	100	+40%	100/15 Summer				29.059	0.434	0.000	0.19			5.7	SURCHARGED	
S1.003	SPS1	240 Winter	100	+40%	100/15 Summer				29.098	0.558	0.000	0.73			3.0	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm																	
US/MH		Return Climate		First (X)	First (Y)	First (Z)	Overflow	Water	Surcharged	Flooded	Half Drain		Pipe				
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	Depth	Volume	Flow /	Overflow	Time	Flow	Status	Level
									(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)		Exceeded
S1.004	SS108	960 Summer	100	+40%					30.475	-0.095	0.000	0.29			3.0	OK	