Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.450	Preferred Cover Depth (m)	1.000
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Car-park	0.032	5.00	16.300	450	100.000	100.000	1.150
Silt Trap	0.004	5.00	16.300	450	100.000	60.000	1.417
Lagoon	0.010	1.00	16.300	450	100.000	45.000	1.517
Outlet	0.000		16.300	450	90.000	45.000	1.584

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
Pipe 1	Car-park	Silt Trap	40.000	0.600	15.150	14.883	0.267	150.0	150	5.81	50.0
Pipe 2	Silt Trap	Lagoon	15.000	0.600	14.883	14.783	0.100	150.0	150	6.12	50.0
Pipe 3	Lagoon	Outlet	10.000	0.600	14.783	14.716	0.067	150.0	150	6.32	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
Pipe 1	0.818	14.5	4.3	1.000	1.267	0.032	0.0	57	0.717
Pipe 2	0.818	14.5	4.9	1.267	1.367	0.036	0.0	60	0.739
Pipe 3	0.818	14.5	6.2	1.367	1.434	0.046	0.0	69	0.788

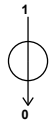
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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
Pipe 1	40.000	150.0	150	Circular	16.300	15.150	1.000	16.300	14.883	1.267
Pipe 2	15.000	150.0	150	Circular	16.300	14.883	1.267	16.300	14.783	1.367
Pipe 3	10.000	150.0	150	Circular	16.300	14.783	1.367	16.300	14.716	1.434

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
Pipe 1	Car-park	450	Manhole	Adoptable	Silt Trap	450	Manhole	Adoptable
Pipe 2	Silt Trap	450	Manhole	Adoptable	Lagoon	450	Manhole	Adoptable
Pipe 3	Lagoon	450	Manhole	Adoptable	Outlet	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Car-park	100.000	100.000	16.300	1.150	450	 0	Pipe 1	15.150	150
Silt Trap	100.000	60.000	16.300	1.417	450	 1 0	Pipe 1 Pipe 2	14.883 14.883	150 150
Lagoon	100.000	45.000	16.300	1.517	450	 1 0	Pipe 2 Pipe 3	14.783 14.783	150 150
Outlet	90.000	45.000	16.300	1.584	450	 1	Pipe 3	14.716	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.450	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
5	0	0	0
10	0	0	0
100	0	0	0

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Node Outlet Online Orifice Control

Flap Valve	x	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	14.716	Diameter (m)	0.019		

Node Lagoon Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	14.783
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	140

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1.0	1.0	1.200	12.0	15.5	2.000	20.0	29.3

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

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Results for 1 year Critical Storm Duration. Lowest mass balance: 93.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Car-park	57	15.227	0.077	2.3	0.0549	0.0000	OK
60 minute winter	Silt Trap	58	15.226	0.343	2.6	0.0741	0.0000	SURCHARGED
60 minute winter	Lagoon	58	15.226	0.443	2.4	1.4714	0.0000	SURCHARGED
60 minute winter	Outlet	58	15.226	0.510	0.8	0.0811	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Car-park	Pipe 1	Silt Trap	2.3	0.503	0.159	0.5330	
60 minute winter	Silt Trap	Pipe 2	Lagoon	1.7	0.367	0.121	0.2641	
60 minute winter	Lagoon	Pipe 3	Outlet	0.8	0.293	0.058	0.1760	
60 minute winter	Outlet	Orifice		0.5				5.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 93.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Car-park	58	15.342	0.192	3.0	0.1377	0.0000	SURCHARGED
60 minute winter	Silt Trap	59	15.342	0.459	3.4	0.0992	0.0000	SURCHARGED
60 minute winter	Lagoon	59	15.342	0.559	3.2	2.1555	0.0000	SURCHARGED
60 minute winter	Outlet	59	15.342	0.626	1.0	0.0996	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Car-park	Pipe 1	Silt Trap	3.0	0.499	0.207	0.7042	
60 minute winter	Silt Trap	Pipe 2	Lagoon	2.3	0.369	0.160	0.2641	
60 minute winter	Lagoon	Pipe 3	Outlet	1.0	0.305	0.072	0.1760	
60 minute winter	Outlet	Orifice		0.6				6.3

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Results for 5 year Critical Storm Duration. Lowest mass balance: 93.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Car-park	98	15.488	0.338	2.3	0.2418	0.0000	SURCHARGED
120 minute winter	Silt Trap	98	15.487	0.604	2.4	0.1305	0.0000	SURCHARGED
120 minute winter	Lagoon	98	15.487	0.704	2.6	3.1814	0.0000	SURCHARGED
120 minute winter	Outlet	98	15.487	0.771	0.9	0.1226	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Car-park	Pipe 1	Silt Trap	2.1	0.407	0.143	0.7042	
120 minute winter	Silt Trap	Pipe 2	Lagoon	2.0	0.354	0.136	0.2641	
120 minute winter	Lagoon	Pipe 3	Outlet	0.9	0.290	0.060	0.1760	
120 minute winter	Outlet	Orifice		0.7				9.4

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Results for 10 year Critical Storm Duration. Lowest mass balance: 93.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Car-park	100	15.599	0.449	2.6	0.3216	0.0000	SURCHARGED
120 minute winter	Silt Trap	100	15.599	0.716	2.6	0.1546	0.0000	SURCHARGED
120 minute winter	Lagoon	100	15.599	0.816	3.0	4.1021	0.0000	SURCHARGED
120 minute winter	Outlet	100	15.598	0.882	0.9	0.1403	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Car-park	Pipe 1	Silt Trap	2.3	0.388	0.157	0.7042	
120 minute winter	Silt Trap	Pipe 2	Lagoon	2.2	0.378	0.155	0.2641	
120 minute winter	Lagoon	Pipe 3	Outlet	0.9	0.290	0.064	0.1760	
120 minute winter	Outlet	Orifice		0.7				10.6

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Results for 100 year Critical Storm Duration. Lowest mass balance: 93.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Car-park	116	16.077	0.927	4.5	0.6634	0.0000	FLOOD RISK
120 minute winter	Silt Trap	116	16.076	1.193	4.6	0.2577	0.0000	FLOOD RISK
120 minute winter	Lagoon	116	16.076	1.293	5.6	9.3347	0.0000	FLOOD RISK
120 minute winter	Outlet	116	16.076	1.360	1.2	0.2162	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Car-park	Pipe 1	Silt Trap	4.0	0.427	0.279	0.7042	
120 minute winter	Silt Trap	Pipe 2	Lagoon	4.2	0.397	0.288	0.2641	
120 minute winter	Lagoon	Pipe 3	Outlet	1.2	0.334	0.083	0.1760	
120 minute winter	Outlet	Orifice		0.9				14.7

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