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)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.009	5.00	45.150	600	384951.979	398149.035	1.350
S2	0.009	5.00	45.150	600	384960.841	398147.127	1.441
FCC	0.018	5.00	45.150	1200	384966.336	398149.199	1.500
OF	0.000		45.150		384967.368	398150.536	1.550

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)
1000	S1	S2	9.065	0.600	43.800	43.709	0.091	100.0	150	5.15	46.1
1001	S2	FCC	5.873	0.600	43.709	43.650	0.059	100.0	150	5.25	45.7
1002	FCC	OF	1.689	0.600	43.650	43.600	0.050	33.8	100	5.27	45.6

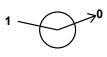
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1000	1.005	17.8	1.1	1.200	1.291	0.009	0.0	25	0.560
1001	1.005	17.8	2.2	1.291	1.350	0.018	0.0	36	0.690
1002	1.332	10.5	4.5	1.400	1.450	0.036	0.0	46	1.280

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)
1000	9.065	100.0	150	Circular	45.150	43.800	1.200	45.150	43.709	1.291
1001	5.873	100.0	150	Circular	45.150	43.709	1.291	45.150	43.650	1.350
1002	1.689	33.8	100	Circular	45.150	43.650	1.400	45.150	43.600	1.450

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1000	S1	600	Manhole	Adoptable	S2	600	Manhole	Adoptable
1001	S2	600	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
1002	FCC	1200	Manhole	Adoptable	OF		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	384951.979	398149.035	45.150	1.350	600				
						0	1000	43.800	150
S2	384960.841	398147.127	45.150	1.441	600	1	1000	43.709	150
									
						0	1001	43.709	150

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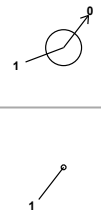
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
FCC	384966.336	398149.199	45.150	1.500	1200	1	1001	43.650	150
						0	1002	43.650	100
OF	384967.368	398150.536	45.150	1.550		1	1002	43.600	100



Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	0.0
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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	10	0	100	45	10	0
30	0	10	0				

Node FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	43.650	Product Number	CTL-SHE-0086-3500-1200-3500
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node FCC Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	44.650	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	15	Depth (m)	0.350
Safety Factor	2.0	Width (m)	4.000	Inf Depth (m)	
Porosity	0.30	Length (m)	20.000		

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Results for 1 year +10% A Critical Storm Duration. Lowest mass balance: 99.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	12	43.835	0.035	1.2	0.0099	0.0000	OK
15 minute winter	S2	12	43.832	0.123	2.4	0.0349	0.0000	OK
15 minute winter	FCC	13	43.830	0.180	4.0	0.2037	0.0000	SURCHARGED
15 minute summer	OF	1	43.600	0.000	3.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1000	S2	1.2	0.370	0.066	0.0843	
15 minute summer	S2	1001	FCC	2.0	0.224	0.111	0.0939	
15 minute winter	FCC	Hydro-Brake®	OF	3.2				2.2

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	15	44.570	0.770	4.0	0.2180	0.0000	SURCHARGED
15 minute winter	S2	15	44.570	0.861	3.7	0.2437	0.0000	SURCHARGED
15 minute winter	FCC	15	44.569	0.919	6.9	1.0399	0.0000	SURCHARGED
15 minute summer	OF	1	43.600	0.000	3.5	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1000	S2	1.9	0.386	0.108	0.1596	
15 minute winter	S2	1001	FCC	2.5	0.225	0.141	0.1034	
15 minute winter	FCC	Hydro-Brake®	OF	3.5				5.3

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Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	27	44.829	1.029	4.2	0.2913	0.0000	SURCHARGED
30 minute winter	S2	27	44.829	1.120	8.6	0.3170	0.0000	SURCHARGED
30 minute winter	FCC	27	44.828	1.178	17.1	5.3755	0.0000	SURCHARGED
15 minute summer	OF	1	43.600	0.000	3.5	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1000	S2	5.7	0.398	0.324	0.1596	
15 minute winter	S2	1001	FCC	10.2	0.578	0.573	0.1034	
180 minute winter	FCC	Hydro-Brake®	OF	3.5				22.1

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