Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	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	0.300	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)
S01	0.043	5.00	25.900	1200	338125.861	349594.106	1.300
S02	0.050	5.00	25.740	1200	338119.157	349573.712	1.340
S03			25.300	1200	338128.637	349556.574	1.000
S04			25.200	1200	338128.897	349538.645	1.000
Inlet			24.900		338125.358	349524.816	0.805
Outlet		5.00	25.000	1200	338129.815	349516.073	1.000
CMH			25.000	1200	338134.012	349515.097	1.050
Outlet 2			23.840	1200	338147.691	349511.712	1.000

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)
1.001	S01	S02	21.468	0.600	24.600	24.400	0.200	107.3	225	5.28	50.0
1.002	S02	S03	19.585	0.600	24.400	24.300	0.100	195.9	225	5.63	50.0
1.003	S03	S04	17.931	0.600	24.300	24.200	0.100	179.3	225	5.94	50.0
1.004	S04	Inlet	14.275	0.600	24.200	24.100	0.100	142.7	225	6.16	50.0
1.006	Outlet	CMH	4.309	0.600	24.000	23.950	0.050	86.2	225	5.05	50.0
1.007	CMH	Outlet 2	14.092	0.600	23.950	22.840	1.110	12.7	225	5.11	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)
1.001	1.261	50.1	5.8	1.075	1.115	0.043	0.0	51	0.846
1.002	0.931	37.0	12.6	1.115	0.775	0.093	0.0	90	0.842
1.003	0.973	38.7	12.6	0.775	0.775	0.093	0.0	88	0.872
1.004	1.092	43.4	12.6	0.775	0.575	0.093	0.0	83	0.950
1.006	1.409	56.0	0.0	0.775	0.825	0.000	0.0	0	0.000
1.007	3.692	146.8	0.0	0.825	0.775	0.000	0.0	0	0.000

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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)
1.001	21.468	107.3	225	Circular	25.900	24.600	1.075	25.740	24.400	1.115
1.002	19.585	195.9	225	Circular	25.740	24.400	1.115	25.300	24.300	0.775
1.003	17.931	179.3	225	Circular	25.300	24.300	0.775	25.200	24.200	0.775
1.004	14.275	142.7	225	Circular	25.200	24.200	0.775	24.900	24.100	0.575
1.006	4.309	86.2	225	Circular	25.000	24.000	0.775	25.000	23.950	0.825
1.007	14.092	12.7	225	Circular	25.000	23.950	0.825	23.840	22.840	0.775

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	S01	1200	Manhole	Adoptable	S02	1200	Manhole	Adoptable
1.002	S02	1200	Manhole	Adoptable	S03	1200	Manhole	Adoptable
1.003	S03	1200	Manhole	Adoptable	S04	1200	Manhole	Adoptable
1.004	S04	1200	Manhole	Adoptable	Inlet		Junction	
1.006	Outlet	1200	Manhole	Adoptable	CMH	1200	Manhole	Adoptable
1.007	CMH	1200	Manhole	Adoptable	Outlet 2	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S01	338125.861	349594.106	25.900	1.300	1200	0	1.001	24.600	225
S02	338119.157	349573.712	25.740	1.340	1200	1	1.001	24.400	225
						0	1.002	24.400	225
S03	338128.637	349556.574	25.300	1.000	1200	1	1.002	24.300	225
						0	1.003	24.300	225
S04	338128.897	349538.645	25.200	1.000	1200	1	1.003	24.200	225
						0	1.004	24.200	225
Inlet	338125.358	349524.816	24.900	0.805		1	1.004	24.100	225
Outlet	338129.815	349516.073	25.000	1.000	1200	0	1.006	24.000	225
CMH	338134.012	349515.097	25.000	1.050	1200	1	1.006	23.950	225
						0	1.007	23.950	225
Outlet 2	338147.691	349511.712	23.840	1.000	1200	1	1.007	22.840	225

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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	0.300	Additional Storage (m³/ha)	20.0
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 %)
2	40	0	0
30	40	0	0
100	40	0	0

Node CMH Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	23.950	Product Number	CTL-SHE-0054-1000-0500-1000
Design Depth (m)	0.500	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node Outlet Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	8.410
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.000	Main Channel Slope (1:X)	88.2
Safety Factor	2.0	Time to half empty (mins)	0	Main Channel n	0.030

Inlets

Inlet

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	22.0	0.0	0.800	128.0	0.0

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Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	24.662	0.062	8.5	0.1109	0.0000	OK
15 minute winter	S02	10	24.516	0.116	18.1	0.2168	0.0000	OK
15 minute winter	S03	11	24.413	0.113	17.8	0.1273	0.0000	OK
240 minute winter	S04	192	24.328	0.128	4.3	0.1445	0.0000	OK
240 minute winter	Inlet	192	24.328	0.233	4.3	0.0000	0.0000	OK
240 minute winter	Outlet	192	24.328	0.328	4.0	0.3706	0.0000	SURCHARGED
240 minute winter	CMH	192	24.328	0.378	3.8	0.4271	0.0000	SURCHARGED
15 minute summer	Outlet 2	1	22.840	0.000	1.0	0.0000	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)
15 minute winter	S01	1.001	S02	8.4	0.576	0.167	0.3152	
15 minute winter	S02	1.002	S03	17.8	0.887	0.481	0.3943	
15 minute winter	S03	1.003	S04	17.9	0.954	0.464	0.3373	
240 minute winter	S04	1.004	Inlet	4.3	0.651	0.099	0.4498	
240 minute winter	Inlet	Flow through pond	Outlet	4.0	0.037	0.000	11.5438	
240 minute winter	Outlet	1.006	CMH	3.8	0.351	0.067	0.1714	
240 minute winter	CMH	Hydro-Brake®	Outlet 2	1.0				24.4

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	24.686	0.086	15.9	0.1541	0.0000	OK
15 minute winter	S02	11	24.582	0.182	34.2	0.3414	0.0000	OK
240 minute winter	S03	232	24.543	0.243	8.0	0.2754	0.0000	SURCHARGED
240 minute winter	S04	232	24.543	0.343	7.7	0.3884	0.0000	SURCHARGED
240 minute winter	Inlet	232	24.544	0.448	7.4	0.0000	0.0000	OK
240 minute winter	Outlet	232	24.543	0.543	4.4	0.6144	0.0000	SURCHARGED
240 minute winter	CMH	232	24.543	0.593	3.5	0.6711	0.0000	SURCHARGED
15 minute summer	Outlet 2	1	22.840	0.000	1.0	0.0000	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)
15 minute winter	S01	1.001	S02	15.7	0.648	0.313	0.5180	
15 minute winter	S02	1.002	S03	33.2	0.999	0.899	0.6584	
240 minute winter	S03	1.003	S04	7.7	0.734	0.200	0.7131	
240 minute winter	S04	1.004	Inlet	7.4	0.634	0.171	0.5677	
240 minute winter	Inlet	Flow through pond	Outlet	4.4	0.047	0.000	27.3611	
240 minute winter	Outlet	1.006	CMH	3.5	0.391	0.062	0.1714	
240 minute winter	CMH	Hydro-Brake®	Outlet 2	1.1				27.9

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	11	24.699	0.099	20.4	0.1780	0.0000	OK
15 minute winter	S02	11	24.681	0.281	43.8	0.5267	0.0000	SURCHARGED
240 minute winter	S03	232	24.666	0.366	10.4	0.4140	0.0000	SURCHARGED
240 minute winter	S04	236	24.666	0.466	9.8	0.5270	0.0000	SURCHARGED
240 minute winter	Inlet	236	24.666	0.571	9.6	0.0000	0.0000	OK
240 minute winter	Outlet	236	24.666	0.666	5.6	0.7531	0.0000	SURCHARGED
240 minute winter	CMH	236	24.666	0.716	3.6	0.8098	0.0000	SURCHARGED
15 minute summer	Outlet 2	1	22.840	0.000	1.0	0.0000	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)
15 minute winter	S01	1.001	S02	20.2	0.662	0.402	0.6080	
15 minute winter	S02	1.002	S03	41.6	1.046	1.124	0.7788	
240 minute winter	S03	1.003	S04	9.8	0.729	0.254	0.7131	
240 minute winter	S04	1.004	Inlet	9.6	0.592	0.222	0.5677	
240 minute winter	Inlet	Flow through pond	Outlet	5.6	0.044	0.000	39.0858	
240 minute winter	Outlet	1.006	CMH	3.6	0.347	0.064	0.1714	
240 minute winter	CMH	Hydro-Brake®	Outlet 2	1.2				30.1

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