

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	46.500	600	55.908	57.536	0.750
S2	0.012	5.00	46.500	600	59.455	62.683	0.912
S3	0.001	5.00	46.500	1200	72.818	53.830	1.500
S4	0.006	5.00	46.500	450	65.424	46.718	0.750
JUNCTION	0.001	5.00	46.500		68.393	45.196	1.532
S5	0.002	5.00	46.500	450	44.644	42.265	0.750
S6	0.016	5.00	46.500	450	60.753	31.391	1.097
FCC	0.001	5.00	46.500	1200	63.240	35.141	1.570
EX MHC1	0.000		46.500	600	63.557	33.394	1.588
EX UU MH	0.000		45.100	2400	64.043	21.762	2.130

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	6.251	0.600	45.750	45.638	0.112	56.0	100	5.10	46.3
1001	S2	S3	16.030	0.600	45.588	45.300	0.288	55.7	150	5.30	45.5
1002	S3	JUNCTION	9.702	0.600	45.000	44.968	0.032	300.0	450	5.44	45.0
2000	S4	JUNCTION	3.336	0.600	45.750	45.268	0.482	6.9	150	5.01	46.6
1003	JUNCTION	FCC	11.299	0.600	44.968	44.930	0.038	300.0	450	5.60	44.4
3000	S5	S6	19.436	0.600	45.750	45.403	0.347	56.0	100	5.31	45.4
3001	S6	FCC	4.500	0.600	45.403	45.280	0.123	36.6	100	5.37	45.2
1004	FCC	EX MHC1	1.776	0.600	44.930	44.912	0.018	98.6	150	5.63	44.3
1005	EX MHC1	EX UU MH	11.642	0.600	44.912	42.970	1.942	6.0	150	5.67	44.1

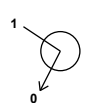
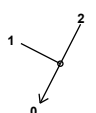
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1000	1.031	8.1	1.1	0.650	0.762	0.009	0.0	25	0.727
1001	1.351	23.9	2.6	0.762	1.050	0.021	0.0	33	0.884
1002	1.168	185.8	2.7	1.050	1.082	0.022	0.0	37	0.426
2000	3.854	68.1	0.8	0.600	1.082	0.006	0.0	11	1.290
1003	1.168	185.8	3.5	1.082	1.120	0.029	0.0	43	0.464
3000	1.031	8.1	0.2	0.650	0.997	0.002	0.0	12	0.457
3001	1.279	10.0	2.2	0.997	1.120	0.018	0.0	32	1.022
1004	1.012	17.9	5.8	1.420	1.438	0.048	0.0	58	0.901
1005	4.142	73.2	5.7	1.438	1.980	0.048	0.0	28	2.483

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	6.251	56.0	100	Circular	46.500	45.750	0.650	46.500	45.638	0.762
1001	16.030	55.7	150	Circular	46.500	45.588	0.762	46.500	45.300	1.050
1002	9.702	300.0	450	Circular	46.500	45.000	1.050	46.500	44.968	1.082
2000	3.336	6.9	150	Circular	46.500	45.750	0.600	46.500	45.268	1.082
1003	11.299	300.0	450	Circular	46.500	44.968	1.082	46.500	44.930	1.120
3000	19.436	56.0	100	Circular	46.500	45.750	0.650	46.500	45.403	0.997
3001	4.500	36.6	100	Circular	46.500	45.403	0.997	46.500	45.280	1.120
1004	1.776	98.6	150	Circular	46.500	44.930	1.420	46.500	44.912	1.438
1005	11.642	6.0	150	Circular	46.500	44.912	1.438	45.100	42.970	1.980

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	S3	1200	Manhole	Adoptable
1002	S3	1200	Manhole	Adoptable	JUNCTION		Junction	
2000	S4	450	Manhole	Adoptable	JUNCTION		Junction	
1003	JUNCTION		Junction		FCC	1200	Manhole	Adoptable
3000	S5	450	Manhole	Adoptable	S6	450	Manhole	Adoptable
3001	S6	450	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
1004	FCC	1200	Manhole	Adoptable	EX MHC1	600	Manhole	Adoptable
1005	EX MHC1	600	Manhole	Adoptable	EX UU MH	2400	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	55.908	57.536	46.500	0.750	600				
						0	1000	45.750	100
S2	59.455	62.683	46.500	0.912	600		1	1000	45.638
						0	1001	45.588	150
S3	72.818	53.830	46.500	1.500	1200		1	1001	45.300
						0	1002	45.000	450
S4	65.424	46.718	46.500	0.750	450		0	2000	45.750
						0	2000	45.268	150
JUNCTION	68.393	45.196	46.500	1.532			1	1002	44.968
						2	1002	44.968	450
						0	1003	44.968	450
S5	44.644	42.265	46.500	0.750	450		0	3000	45.750
						0	3000	45.750	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S6	60.753	31.391	46.500	1.097	450		1 3000	45.403	100
							0 3001	45.403	100
FCC	63.240	35.141	46.500	1.570	1200		1 3001	45.280	100
							2 1003	44.930	450
							0 1004	44.930	150
EX MHC1	63.557	33.394	46.500	1.588	600		1 1004	44.912	150
							0 1005	44.912	150
EX UU MH	64.043	21.762	45.100	2.130	2400		1 1005	42.970	150

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)	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
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	10	0

Node FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	44.930	Product Number	CTL-SHE-0103-5000-1200-5000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	45.775	0.025	1.1	0.0133	0.0000	OK
15 minute winter	S2	10	45.621	0.033	2.5	0.0179	0.0000	OK
15 minute winter	S3	13	45.055	0.055	2.5	0.0628	0.0000	OK
15 minute winter	S4	10	45.761	0.011	0.7	0.0035	0.0000	OK
15 minute winter	JUNCTION	13	45.054	0.086	3.2	0.0011	0.0000	OK
30 minute winter	S5	20	45.761	0.011	0.2	0.0023	0.0000	OK
15 minute winter	S6	10	45.436	0.033	2.1	0.0147	0.0000	OK
15 minute winter	FCC	13	45.055	0.125	4.4	0.1432	0.0000	OK
15 minute winter	EX MHC1	13	44.936	0.024	4.0	0.0069	0.0000	OK
15 minute winter	EX UU MH	13	42.994	0.024	4.0	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	1.1	0.700	0.132	0.0095	
15 minute winter	S2	1001	S3	2.4	0.858	0.100	0.0448	
15 minute summer	S3	1002	JUNCTION	2.4	0.329	0.013	0.1409	
15 minute winter	S4	2000	JUNCTION	0.7	1.233	0.010	0.0019	
15 minute winter	JUNCTION	1003	FCC	2.6	0.178	0.014	0.3228	
30 minute winter	S5	3000	S6	0.2	0.193	0.025	0.0231	
15 minute winter	S6	3001	FCC	2.1	0.965	0.205	0.0096	
15 minute winter	FCC	Hydro-Brake®	EX MHC1	4.0				
15 minute winter	EX MHC1	1005	EX UU MH	4.0	2.196	0.055	0.0214	2.5

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	45.791	0.041	2.6	0.0214	0.0000	OK
15 minute winter	S2	10	45.641	0.053	6.1	0.0290	0.0000	OK
15 minute winter	S3	15	45.259	0.259	6.3	0.2966	0.0000	OK
15 minute summer	S4	10	45.767	0.017	1.7	0.0053	0.0000	OK
15 minute winter	JUNCTION	14	45.257	0.289	5.7	0.0038	0.0000	OK
15 minute winter	S5	10	45.768	0.018	0.6	0.0038	0.0000	OK
15 minute winter	S6	10	45.459	0.056	5.3	0.0254	0.0000	OK
15 minute winter	FCC	15	45.259	0.329	8.2	0.3760	0.0000	SURCHARGED
15 minute winter	EX MHC1	15	44.939	0.027	5.0	0.0077	0.0000	OK
15 minute winter	EX UU MH	15	42.997	0.027	5.0	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	2.6	0.885	0.318	0.0182	
15 minute winter	S2	1001	S3	6.0	1.103	0.251	0.0871	
15 minute summer	S3	1002	JUNCTION	4.0	0.330	0.022	0.8285	
15 minute summer	S4	2000	JUNCTION	1.7	1.607	0.025	0.0035	
15 minute summer	JUNCTION	1003	FCC	3.9	0.182	0.021	1.1446	
15 minute winter	S5	3000	S6	0.6	0.219	0.069	0.0533	
15 minute winter	S6	3001	FCC	5.1	1.204	0.512	0.0192	
15 minute winter	FCC	Hydro-Brake®	EX MHC1	5.0				
15 minute winter	EX MHC1	1005	EX UU MH	5.0	2.335	0.068	0.0249	6.4

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	27	46.137	0.387	4.2	0.2118	0.0000	SURCHARGED
30 minute winter	S2	27	46.135	0.547	9.8	0.3130	0.0000	SURCHARGED
30 minute winter	S3	27	46.133	1.133	10.4	1.2981	0.0000	SURCHARGED
30 minute winter	S4	27	46.133	0.383	3.4	0.1282	0.0000	SURCHARGED
30 minute winter	JUNCTION	26	46.132	1.164	8.5	0.0163	0.0000	SURCHARGED
30 minute winter	S5	27	46.139	0.389	3.2	0.0848	0.0000	SURCHARGED
30 minute winter	S6	27	46.138	0.735	8.3	0.3530	0.0000	SURCHARGED
30 minute winter	FCC	27	46.133	1.203	9.2	1.3770	0.0000	SURCHARGED
15 minute summer	EX MHC1	35	44.939	0.027	5.0	0.0077	0.0000	OK
15 minute summer	EX UU MH	35	42.997	0.027	5.0	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	5.3	1.047	0.658	0.0489	
15 minute winter	S2	1001	S3	12.4	1.322	0.518	0.2822	
15 minute summer	S3	1002	JUNCTION	7.1	0.356	0.038	1.5372	
15 minute winter	S4	2000	JUNCTION	3.6	1.962	0.053	0.0587	
60 minute winter	JUNCTION	1003	FCC	4.1	0.171	0.022	1.7903	
30 minute winter	S5	3000	S6	-2.4	-0.303	-0.291	0.1521	
15 minute winter	S6	3001	FCC	9.7	1.310	0.962	0.0352	
30 minute summer	FCC	Hydro-Brake®	EX MHC1	5.0				
15 minute summer	EX MHC1	1005	EX UU MH	5.0	2.336	0.068	0.0249	11.8