Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	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	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWM01	0.022	5.00		65.973	1200	380729.125	385240.034	0.758
SWM02	0.287	5.00		66.242	1200	380793.692	385175.619	2.077
SWM03	0.006	5.00		67.015	1200	380876.476	385092.907	1.350
SWM04				67.015	1200	380841.321	385128.099	3.125
SWM07		5.00		66.635	1200	380860.808	385086.996	1.350
SWM06				66.635	1200	380830.561	385117.253	1.774
SWM05	0.269	5.00		66.874	1350	380837.345	385124.032	3.082
8				66.875		380845.278	385116.175	3.115
9	0.046	5.00		66.875		380876.771	385084.607	3.189
SWM09	0.266	5.00		66.550	1200	380855.760	385049.643	1.500
SWM08	0.266	5.00		66.540	1350	380873.764	385067.569	1.744
Flow Control Chamber				66.695	3000	380880.209	385073.986	3.041
Phase 2 Stub		5.00	61.7	66.990		380835.566	385146.076	3.043
SWM10				67.265	1350	380899.646	385081.975	3.579
SWM11				67.135	1350	380885.985	385068.318	3.505
SWM12				67.225	1350	380850.675	385032.673	3.740

Links

Name	US Node	DS Node	ks (mm) / n	US IL (m)	DS IL (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	SWM02	SWM04	0.600	64.165	63.890	244.7	300	7.64	50.0
2.000	SWM03	SWM04	0.600	65.665	65.172	100.9	150	5.83	50.0
1.002	SWM04	SWM05	0.600	63.890	63.867	247.3	300	7.74	50.0
3.000	SWM07	SWM06	0.600	65.285	64.861	100.9	150	5.71	50.0
3.001	SWM06	SWM05	0.600	64.861	64.765	99.9	150	5.87	50.0
1.003	SWM05	8	0.600	63.792	63.760	348.9	450	7.91	50.0
1.005	9	Flow Control Chamber	0.600	63.686	63.654	348.9	450	8.51	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	1.000	70.7	41.8	1.777	2.825	0.308	0.0	166	1.041
2.000	1.000	17.7	0.8	1.200	1.693	0.006	0.0	22	0.508
1.002	0.995	70.3	42.6	2.825	2.707	0.315	0.0	168	1.040
3.000	1.000	17.7	0.0	1.200	1.624	0.000	0.0	0	0.000
3.001	1.005	17.8	0.0	1.624	1.959	0.000	0.0	0	0.000
1.003	1.082	172.1	79.1	2.632	2.665	0.584	0.0	214	1.060
1.005	1.082	172.2	85.3	2.739	2.591	0.629	0.0	224	1.080

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Links

Name	US Node	DS Node	ks (mm) / n	US IL (m)	DS IL (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.000	SWM09	SWM08	0.600	65.050	64.946	245.0	300	5.42	50.0
4.001	SWM08	Flow Control Chamber	0.600	64.796	64.770	345.0	450	5.56	50.0
1.006	Flow Control Chamber	SWM11	0.600	63.654	63.630	337.2	450	8.63	50.0
5.000	Phase 2 Stub	SWM10	0.600	63.947	63.686	347.3	450	6.39	50.0
5.001	SWM10	SWM11	0.600	63.686	63.630	344.9	450	6.69	50.0
1.007	SWM11	SWM12	0.600	63.630	63.485	345.0	450	9.40	50.0
1.004	8	9	0.600	63.760	63.686	602.6	1500	8.34	50.0
1.000	SWM01	SWM02	0.600	65.215	64.311	100.9	150	6.52	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)
4.000	1.000	70.7	36.1	1.200	1.294	0.266	0.0	152	1.005
4.001	1.089	173.1	72.2	1.294	1.475	0.533	0.0	203	1.041
1.006	1.101	175.1	157.5	2.591	3.055	1.162	0.0	335	1.239
5.000	1.085	172.6	61.7	2.593	3.129	0.000	61.7	186	0.999
5.001	1.089	173.1	61.7	3.129	3.055	0.000	61.7	185	1.000
1.007	1.089	173.1	219.2	3.055	3.290	1.162	61.7	450	1.102
1.004	1.740	15371.3	79.1	1.615	1.689	0.584	0.0	75	0.479
1.000	1.000	17.7	2.9	0.608	1.781	0.022	0.0	41	0.742

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)	0.0
Ratio-R	0.400	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
30	30	0	0
100	0	0	0
100	40	0	0

Node Flow Control Chamber Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	63.654	Product Number	CTL-SHE-0266-5470-3800-5470
Design Depth (m)	3.800	Min Outlet Diameter (m)	0.000
Design Flow (l/s)	54.7	Min Node Diameter (mm)	0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWM01	12	65.254	0.039	3.0	0.0444	0.0000	OK
15 minute winter	SWM02	10	64.333	0.168	42.7	0.1905	0.0000	OK
15 minute winter	SWM03	11	65.687	0.022	0.9	0.0243	0.0000	OK
60 minute winter	SWM04	44	64.092	0.202	22.8	0.2288	0.0000	OK
15 minute summer	SWM07	1	65.285	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWM06	1	64.861	0.000	0.0	0.0000	0.0000	OK
60 minute winter	SWM05	45	64.092	0.300	41.1	0.4288	0.0000	OK
60 minute winter	8	45	64.092	0.332	40.1	0.0000	0.0000	OK
60 minute winter	9	46	64.092	0.406	37.1	0.0000	0.0000	OK
15 minute winter	SWM09	10	65.212	0.162	37.5	0.1828	0.0000	OK
15 minute winter	SWM08	10	65.014	0.218	74.2	0.3115	0.0000	OK
60 minute winter	Flow Control Chamber	46	64.091	0.437	39.0	3.0898	0.0000	OK
60 minute winter	Phase 2 Stub	2	64.139	0.192	61.7	0.0000	0.0000	OK
60 minute winter	SWM10	47	63.904	0.218	66.5	0.3121	0.0000	OK
60 minute winter	SWM11	46	63.870	0.240	92.2	0.3440	0.0000	OK
60 minute winter	SWM12	46	63.696	0.211	92.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWM01	1.000	SWM02	2.6	0.723	0.3334	
15 minute winter	SWM02	1.001	SWM04	42.1	0.992	2.8785	
15 minute winter	SWM03	2.000	SWM04	0.8	0.503	0.0766	
60 minute winter	SWM04	1.002	SWM05	21.5	0.816	0.3046	
15 minute summer	SWM07	3.000	SWM06	0.0	0.000	0.0000	
15 minute summer	SWM06	3.001	SWM05	0.0	0.000	0.0000	
60 minute winter	SWM05	1.003	8	40.1	0.989	1.3252	
60 minute winter	8	1.004	9	18.5	0.065	74.9477	
60 minute winter	9	1.005	Flow Control Chamber	22.3	-0.414	1.7173	
15 minute winter	SWM09	4.000	SWM08	36.7	1.009	0.9294	
15 minute winter	SWM08	4.001	Flow Control Chamber	73.6	1.064	0.6290	
60 minute winter	Flow Control Chamber	1.006	SWM11	30.6	0.374	0.6616	
60 minute winter	Phase 2 Stub	5.000	SWM10	66.5	1.235	6.1735	
60 minute winter	SWM10	5.001	SWM11	61.9	1.184	1.5670	
60 minute winter	SWM11	1.007	SWM12	92.2	1.160	3.9887	1210.1

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Results for 30 year +30% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWM01	12	65.579	0.364	9.7	0.4121	0.0000	SURCHARGED
15 minute winter	SWM02	11	65.393	1.228	134.5	1.3892	0.0000	SURCHARGED
15 minute winter	SWM03	11	65.704	0.039	2.7	0.0441	0.0000	OK
60 minute winter	SWM04	51	64.662	0.772	69.3	0.8735	0.0000	SURCHARGED
15 minute summer	SWM07	1	65.285	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWM06	1	64.861	0.000	0.0	0.0000	0.0000	OK
60 minute winter	SWM05	51	64.660	0.868	130.3	1.2426	0.0000	SURCHARGED
60 minute winter	8	51	64.659	0.899	129.5	0.0000	0.0000	OK
60 minute winter	9	50	64.659	0.973	116.9	0.0000	0.0000	SURCHARGED
15 minute winter	SWM09	10	65.619	0.569	119.6	0.6432	0.0000	SURCHARGED
15 minute winter	SWM08	10	65.252	0.456	237.8	0.6529	0.0000	SURCHARGED
60 minute winter	Flow Control Chamber	49	64.658	1.004	122.2	7.1007	0.0000	SURCHARGED
120 minute summer	Phase 2 Stub	2	64.139	0.192	61.7	0.0000	0.0000	OK
60 minute winter	SWM10	53	63.926	0.240	66.5	0.3439	0.0000	OK
60 minute winter	SWM11	51	63.906	0.276	115.0	0.3948	0.0000	OK
60 minute winter	SWM12	52	63.722	0.237	115.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWM01	1.000	SWM02	11.2	0.637	1.6056	
15 minute winter	SWM02	1.001	SWM04	123.1	1.748	4.7379	
15 minute winter	SWM03	2.000	SWM04	2.6	0.715	0.1794	
60 minute winter	SWM04	1.002	SWM05	68.6	0.974	0.4005	
15 minute summer	SWM07	3.000	SWM06	0.0	0.000	0.0000	
15 minute summer	SWM06	3.001	SWM05	0.0	0.000	0.0000	
60 minute winter	SWM05	1.003	8	129.5	1.305	1.7690	
60 minute winter	8	1.004	9	47.0	0.123	257.5808	
60 minute winter	9	1.005	Flow Control Chamber	-70.1	-0.555	1.7689	
15 minute winter	SWM09	4.000	SWM08	118.2	1.678	1.7891	
15 minute winter	SWM08	4.001	Flow Control Chamber	236.7	1.592	1.3097	
60 minute winter	Flow Control Chamber	1.006	SWM11	53.3	0.539	0.7996	
120 minute summer	Phase 2 Stub	5.000	SWM10	66.5	1.153	6.6012	
60 minute winter	SWM10	5.001	SWM11	62.0	1.184	1.8155	
60 minute winter	SWM11	1.007	SWM12	115.0	1.234	4.6749	1475.1

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWM01	12	65.574	0.359	9.7	0.4058	0.0000	SURCHARGED
15 minute winter	SWM02	11	65.391	1.226	134.3	1.3862	0.0000	SURCHARGED
15 minute winter	SWM03	11	65.704	0.039	2.7	0.0441	0.0000	OK
60 minute winter	SWM04	51	64.674	0.784	70.1	0.8862	0.0000	SURCHARGED
15 minute summer	SWM07	1	65.285	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWM06	1	64.861	0.000	0.0	0.0000	0.0000	OK
60 minute winter	SWM05	51	64.672	0.880	131.7	1.2587	0.0000	SURCHARGED
60 minute winter	8	51	64.671	0.911	130.8	0.0000	0.0000	OK
60 minute winter	9	52	64.670	0.984	110.7	0.0000	0.0000	SURCHARGED
15 minute winter	SWM09	10	65.617	0.567	119.4	0.6408	0.0000	SURCHARGED
15 minute winter	SWM08	10	65.252	0.456	237.4	0.6519	0.0000	SURCHARGED
60 minute winter	Flow Control Chamber	53	64.669	1.015	123.6	7.1724	0.0000	SURCHARGED
120 minute summer	Phase 2 Stub	2	64.139	0.192	61.7	0.0000	0.0000	OK
60 minute winter	SWM10	53	63.926	0.240	66.5	0.3441	0.0000	OK
60 minute winter	SWM11	51	63.906	0.276	115.1	0.3950	0.0000	OK
60 minute winter	SWM12	52	63.722	0.237	115.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWM01	1.000	SWM02	11.2	0.636	1.6056	
15 minute winter	SWM02	1.001	SWM04	123.0	1.747	4.7379	
15 minute winter	SWM03	2.000	SWM04	2.6	0.715	0.1794	
60 minute winter	SWM04	1.002	SWM05	69.3	0.985	0.4005	
15 minute summer	SWM07	3.000	SWM06	0.0	0.000	0.0000	
15 minute summer	SWM06	3.001	SWM05	0.0	0.000	0.0000	
60 minute winter	SWM05	1.003	8	130.8	1.366	1.7690	
60 minute winter	8	1.004	9	40.8	0.123	261.1481	
60 minute winter	9	1.005	Flow Control Chamber	-71.8	-0.558	1.7689	
15 minute winter	SWM09	4.000	SWM08	118.0	1.676	1.7891	
15 minute winter	SWM08	4.001	Flow Control Chamber	236.3	1.590	1.3092	
60 minute winter	Flow Control Chamber	1.006	SWM11	53.4	0.540	0.8002	
120 minute summer	Phase 2 Stub	5.000	SWM10	66.5	1.153	6.6041	
60 minute winter	SWM10	5.001	SWM11	62.0	1.184	1.8167	
60 minute winter	SWM11	1.007	SWM12	115.1	1.234	4.6778	1479.5

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWM01	10	65.973	0.758	22.7	0.8573	3.7045	FLOOD
15 minute winter	SWM02	10	66.242	2.077	180.2	2.3491	1.1988	FLOOD
15 minute winter	SWM03	11	65.711	0.046	3.8	0.0526	0.0000	OK
120 minute winter	SWM04	94	65.208	1.318	60.4	1.4911	0.0000	SURCHARGED
15 minute summer	SWM07	1	65.285	0.000	0.0	0.0000	0.0000	OK
120 minute winter	SWM06	94	65.206	0.345	2.5	0.3906	0.0000	SURCHARGED
120 minute winter	SWM05	94	65.206	1.414	113.4	2.0238	0.0000	SURCHARGED
120 minute winter	8	94	65.205	1.445	112.7	0.0000	0.0000	OK
120 minute winter	9	94	65.205	1.519	86.3	0.0000	0.0000	SURCHARGED
15 minute winter	SWM09	10	66.129	1.079	167.3	1.2208	0.0000	SURCHARGED
15 minute winter	SWM08	10	65.397	0.601	332.5	0.8603	0.0000	SURCHARGED
120 minute winter	Flow Control Chamber	94	65.204	1.550	106.0	10.9545	0.0000	SURCHARGED
120 minute summer	Phase 2 Stub	2	64.139	0.192	61.7	0.0000	0.0000	OK
180 minute winter	SWM10	152	63.928	0.242	62.0	0.3463	0.0000	OK
180 minute winter	SWM11	152	63.908	0.278	116.3	0.3977	0.0000	OK
180 minute winter	SWM12	152	63.723	0.238	116.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWM01	1.000	SWM02	12.4	0.703	1.6056	
15 minute winter	SWM02	1.001	SWM04	158.3	2.248	4.7379	
15 minute winter	SWM03	2.000	SWM04	3.6	0.788	0.2293	
120 minute winter	SWM04	1.002	SWM05	59.8	0.850	0.4005	
15 minute summer	SWM07	3.000	SWM06	0.0	0.000	0.0000	
120 minute winter	SWM06	3.001	SWM05	-2.5	-0.204	0.1688	
120 minute winter	SWM05	1.003	8	112.7	1.186	1.7690	
120 minute winter	8	1.004	9	28.3	0.084	390.2666	
120 minute winter	9	1.005	Flow Control Chamber	52.9	-0.450	1.7689	
15 minute winter	SWM09	4.000	SWM08	165.2	2.346	1.7891	
15 minute winter	SWM08	4.001	Flow Control Chamber	331.6	2.096	1.3937	
120 minute winter	Flow Control Chamber	1.006	SWM11	54.6	0.547	0.8077	
120 minute summer	Phase 2 Stub	5.000	SWM10	66.5	1.153	6.6589	
180 minute winter	SWM10	5.001	SWM11	62.0	0.972	1.8314	
180 minute winter	SWM11	1.007	SWM12	116.3	1.238	4.7143	2264.6

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