

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)	18.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.376	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

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)
1.000	17.724	100.1	150	1 STANDARD	31.050	30.036	0.864	31.200	29.859	1.191
1.001	10.885	99.9	150	1 STANDARD	31.200	29.859	1.191	30.920	29.750	1.020
1.002	24.098	169.7	225	1 STANDARD	30.920	29.675	1.020	31.000	29.533	1.242
2.000	21.781	99.5	150	1 STANDARD	31.120	29.927	1.043	31.120	29.708	1.262
2.001	16.980	169.8	225	1 STANDARD	31.120	29.633	1.262	31.000	29.533	1.242
1.003	15.029	170.8	225	1 STANDARD	31.000	29.533	1.242	31.170	29.445	1.500
3.000	52.516	100.0	150	1 STANDARD	31.170	30.303	0.717	31.170	29.778	1.242
3.001	3.288	99.6	150	1 STANDARD	31.170	29.778	1.242	31.170	29.745	1.275
1.004	15.000	241.9	300	1 STANDARD	31.170	29.370	1.500	31.220	29.308	1.612
1.005	12.000	240.0	300	1 STANDARD	31.220	29.308	1.612	31.400	29.258	1.842
1.000_1	15.755	45.0	150	1 STANDARD	31.420	30.500	0.770	31.450	30.150	1.150
4.000	18.000	90.0	300	1 STANDARD	31.450	30.000	1.150	31.310	29.800	1.210
1.002_1	6.103	101.7	300	1 STANDARD	31.310	29.860	1.150	31.240	29.800	1.140
4.001	36.000	102.9	300	1 STANDARD	31.240	29.800	1.140	31.360	29.450	1.610
4.002	20.915	108.9	300	1 STANDARD	31.360	29.450	1.610	31.400	29.258	1.842
5.000	23.000	127.8	300	1 STANDARD	31.510	29.630	1.580	31.470	29.450	1.720
5.001	23.398	121.9	300	1 STANDARD	31.470	29.450	1.720	31.400	29.258	1.842
1.006	10.000	238.1	300	1 STANDARD	31.400	29.258	1.842	30.950	29.216	1.434
1.007	4.000	235.3	300	1 STANDARD	30.950	29.216	1.434	31.000	29.199	1.501

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S3C - CP	600	Manhole	1 STANDARD	S3B - CP	600	Manhole	1 STANDARD
1.001	S3B - CP	600	Manhole	1 STANDARD	S3A - CP	600	Manhole	1 STANDARD
1.002	S3A - CP	600	Manhole	1 STANDARD	S3 - CP	600	Manhole	1 STANDARD
2.000	S15 - CP	600	Manhole	1 STANDARD	S16 - CP	600	Manhole	1 STANDARD
2.001	S16 - CP	600	Manhole	1 STANDARD	S3 - CP	600	Manhole	1 STANDARD
1.003	S3 - CP	600	Manhole	1 STANDARD	S4	1500	Manhole	1 STANDARD
3.000	S1 - CP	600	Manhole	1 STANDARD	S2 - CP	600	Manhole	1 STANDARD
3.001	S2 - CP	600	Manhole	1 STANDARD	S4	1500	Manhole	1 STANDARD
1.004	S4	1500	Manhole	1 STANDARD	S5 - CP	1500	Manhole	1 STANDARD
1.005	S5 - CP	1500	Manhole	1 STANDARD	S11	1500	Manhole	1 STANDARD
1.000_1	S6A	600	Manhole	1 STANDARD	S6	1200	Manhole	1 STANDARD
4.000	S6	1200	Manhole	1 STANDARD	S7A	1200	Manhole	1 STANDARD
1.002_1	S7A	1200	Manhole	1 STANDARD	S7	1200	Manhole	1 STANDARD
4.001	S7	1200	Manhole	1 STANDARD	S8 - CP	1200	Manhole	1 STANDARD
4.002	S8 - CP	1200	Manhole	1 STANDARD	S11	1500	Manhole	1 STANDARD
5.000	S9	1200	Manhole	1 STANDARD	S10 - CP	1200	Manhole	1 STANDARD
5.001	S10 - CP	1200	Manhole	1 STANDARD	S11	1500	Manhole	1 STANDARD
1.006	S11	1500	Manhole	1 STANDARD	S12	1200	Manhole	1 STANDARD
1.007	S12	1200	Manhole	1 STANDARD	S13 - FCC	1500	Manhole	1 STANDARD

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)
1.008	14.000	100.0	150	1 STANDARD	31.000	29.199	1.651	31.000	29.059	1.791
1.011	21.000	100.0	150	1 STANDARD	31.000	29.059	1.791	31.000	28.849	2.001
1.009	6.140	100.0	150	1 STANDARD	31.000	28.849	2.001	30.760	28.788	1.822

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.008	S13 - FCC	1500	Manhole	1 STANDARD	S14	1200	Manhole	1 STANDARD
1.011	S14	1200	Manhole	1 STANDARD	S15	1200	Manhole	1 STANDARD
1.009	S15	1200	Manhole	1 STANDARD	OUTFALL		Manhole	1 STANDARD

Node S13 - FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	29.199	Product Number	CTL-SHE-0100-5000-1400-5000
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node S13 - FCC Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	29.199
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	140.0	0.0	0.800	140.0	0.0	0.801	0.0	0.0

Node S1 - CP Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	30.500	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.400
Safety Factor	2.0	Width (m)	4.800	Inf Depth (m)	
Porosity	1.00	Length (m)	66.000		

Node S3C - CP Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	30.320	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	375	Depth (m)	0.400
Safety Factor	2.0	Width (m)	4.800	Inf Depth (m)	
Porosity	1.00	Length (m)	29.000		

Node S15 - CP Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	30.520	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.400
Safety Factor	2.0	Width (m)	4.800	Inf Depth (m)	
Porosity	1.00	Length (m)	24.000		

Node S3A - CP Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	30.320	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	435	Depth (m)	0.400
Safety Factor	2.0	Width (m)	9.600	Inf Depth (m)	
Porosity	1.00	Length (m)	19.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S3C - CP	10	30.075	0.039	2.6	0.0273	0.0000	OK
15 minute winter	S3B - CP	11	29.898	0.039	2.5	0.0111	0.0000	OK
15 minute winter	S3A - CP	10	29.763	0.088	12.7	0.1416	0.0000	OK
15 minute winter	S15 - CP	11	29.957	0.030	1.6	0.0151	0.0000	OK
15 minute winter	S16 - CP	11	29.663	0.030	1.5	0.0085	0.0000	OK
15 minute winter	S3 - CP	11	29.643	0.110	17.3	0.0715	0.0000	OK
15 minute winter	S1 - CP	10	30.357	0.054	5.1	0.0667	0.0000	OK
15 minute winter	S2 - CP	11	29.838	0.060	5.0	0.0170	0.0000	OK
15 minute summer	S4	10	29.562	0.192	22.0	0.3503	0.0000	OK
15 minute summer	S5 - CP	10	29.547	0.239	25.2	0.4770	0.0000	OK
15 minute summer	S6A	1	30.500	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S6	10	30.064	0.064	12.0	0.1578	0.0000	OK
15 minute winter	S7A	10	29.935	0.135	11.8	0.1529	0.0000	OK
15 minute winter	S7	10	29.888	0.088	20.8	0.1906	0.0000	OK
15 minute winter	S8 - CP	11	29.552	0.102	27.2	0.1748	0.0000	OK
15 minute winter	S9	10	29.682	0.052	6.6	0.0880	0.0000	OK
15 minute winter	S10 - CP	10	29.554	0.104	6.5	0.1173	0.0000	OK
15 minute winter	S11	10	29.535	0.277	64.9	0.4886	0.0000	OK
15 minute winter	S12	9	29.503	0.287	69.3	0.3248	0.0000	OK
180 minute winter	S13 - FCC	136	29.476	0.277	14.1	37.3092	0.0000	SURCHARGED
180 minute winter	S14	136	29.112	0.053	4.7	0.0603	0.0000	OK
180 minute winter	S15	136	28.905	0.056	4.7	0.0638	0.0000	OK
180 minute winter	OUTFALL	136	28.841	0.053	4.7	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	S3C - CP	1.000	S3B - CP	2.5	0.703	0.144	0.0643	
15 minute winter	S3B - CP	1.001	S3A - CP	2.5	0.701	0.142	0.0391	
15 minute winter	S3A - CP	1.002	S3 - CP	12.6	0.755	0.316	0.4012	
15 minute winter	S15 - CP	2.000	S16 - CP	1.5	0.617	0.086	0.0543	
15 minute winter	S16 - CP	2.001	S3 - CP	1.5	0.148	0.039	0.1900	
15 minute winter	S3 - CP	1.003	S4	17.3	0.932	0.436	0.2829	
15 minute winter	S1 - CP	3.000	S2 - CP	5.0	0.828	0.280	0.3213	
15 minute winter	S2 - CP	3.001	S4	4.9	0.804	0.276	0.0201	
15 minute summer	S4	1.004	S5 - CP	23.2	0.578	0.326	0.8086	
15 minute summer	S5 - CP	1.005	S11	28.6	0.523	0.400	0.7577	
15 minute summer	S6A	1.000_1	S6	0.0	0.000	0.000	0.0000	
15 minute winter	S6	4.000	S7A	11.8	0.581	0.101	0.3756	
15 minute winter	S7A	1.002_1	S7	11.6	0.755	0.106	0.0948	
15 minute winter	S7	4.001	S8 - CP	20.6	1.075	0.188	0.6907	
15 minute winter	S8 - CP	4.002	S11	27.2	0.641	0.256	0.9268	
15 minute winter	S9	5.000	S10 - CP	6.5	0.748	0.066	0.3416	
15 minute winter	S10 - CP	5.001	S11	9.2	0.298	0.091	1.0468	
15 minute winter	S11	1.006	S12	69.3	1.150	0.967	0.6729	
15 minute winter	S12	1.007	S13 - FCC	71.3	2.237	0.988	0.1608	
180 minute winter	S13 - FCC	1.008	S14	4.7	0.824	0.264	0.0795	
180 minute winter	S14	1.011	S15	4.7	0.803	0.264	0.1224	
180 minute winter	S15	1.009	OUTFALL	4.7	0.811	0.264	0.0355	64.4

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	S3C - CP	510	30.366	0.330	1.0	2.7332	0.0000	SURCHARGED
720 minute winter	S3B - CP	510	30.366	0.507	0.8	0.1434	0.0000	SURCHARGED
720 minute winter	S3A - CP	510	30.365	0.690	2.7	5.9494	0.0000	SURCHARGED
720 minute winter	S15 - CP	495	30.365	0.438	0.3	0.2196	0.0000	SURCHARGED
720 minute winter	S16 - CP	495	30.365	0.732	0.3	0.2073	0.0000	SURCHARGED
720 minute winter	S3 - CP	495	30.365	0.832	3.3	0.5419	0.0000	SURCHARGED
15 minute winter	S1 - CP	10	30.394	0.091	12.4	0.1124	0.0000	OK
720 minute winter	S2 - CP	495	30.365	0.587	1.1	0.1662	0.0000	SURCHARGED
720 minute winter	S4	495	30.365	0.995	4.1	1.8143	0.0000	SURCHARGED
720 minute winter	S5 - CP	495	30.365	1.057	4.6	2.1112	0.0000	SURCHARGED
15 minute summer	S6A	1	30.500	0.000	0.0	0.0000	0.0000	OK
720 minute winter	S6	495	30.365	0.365	2.5	0.9021	0.0000	SURCHARGED
720 minute winter	S7A	495	30.365	0.565	2.5	0.6394	0.0000	SURCHARGED
720 minute winter	S7	495	30.365	0.565	4.5	1.2206	0.0000	SURCHARGED
720 minute winter	S8 - CP	495	30.365	0.915	5.8	1.5623	0.0000	SURCHARGED
720 minute winter	S9	495	30.365	0.735	1.4	1.2460	0.0000	SURCHARGED
720 minute winter	S10 - CP	495	30.365	0.915	1.4	1.0350	0.0000	SURCHARGED
720 minute winter	S11	495	30.365	1.107	10.4	1.9563	0.0000	SURCHARGED
720 minute winter	S12	495	30.365	1.149	10.3	1.2993	0.0000	SURCHARGED
720 minute winter	S13 - FCC	495	30.365	1.166	10.2	108.5260	0.0000	SURCHARGED
720 minute winter	S14	495	29.965	0.906	5.0	1.0249	0.0000	SURCHARGED
720 minute winter	S15	495	29.945	1.096	5.0	1.2399	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	29.938	1.150	0.0	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)
720 minute winter	S3C - CP	1.000	S3B - CP	0.8	0.441	0.046	0.3120	
720 minute winter	S3B - CP	1.001	S3A - CP	0.8	0.440	0.047	0.1916	
720 minute winter	S3A - CP	1.002	S3 - CP	2.7	0.468	0.067	0.9584	
720 minute winter	S15 - CP	2.000	S16 - CP	0.3	0.380	0.020	0.3835	
720 minute winter	S16 - CP	2.001	S3 - CP	0.3	0.108	0.008	0.6753	
720 minute winter	S3 - CP	1.003	S4	3.2	0.515	0.081	0.5977	
15 minute winter	S1 - CP	3.000	S2 - CP	12.1	1.015	0.684	0.6328	
720 minute winter	S2 - CP	3.001	S4	1.1	0.526	0.064	0.0579	
720 minute winter	S4	1.004	S5 - CP	4.1	0.361	0.057	1.0563	
720 minute winter	S5 - CP	1.005	S11	4.4	0.271	0.062	0.8450	
15 minute summer	S6A	1.000_1	S6	0.0	0.000	0.000	0.0000	
720 minute winter	S6	4.000	S7A	2.5	0.246	0.021	1.2675	
720 minute winter	S7A	1.002_1	S7	2.7	0.514	0.024	0.4298	
720 minute winter	S7	4.001	S8 - CP	4.4	0.589	0.040	2.5351	
720 minute winter	S8 - CP	4.002	S11	5.5	0.323	0.052	1.4728	
720 minute winter	S9	5.000	S10 - CP	1.4	0.408	0.015	1.6196	
720 minute winter	S10 - CP	5.001	S11	1.4	0.103	0.014	1.6477	
720 minute winter	S11	1.006	S12	10.3	0.437	0.144	0.7042	
720 minute winter	S12	1.007	S13 - FCC	10.2	0.770	0.142	0.2817	
720 minute winter	S13 - FCC	1.008	S14	5.0	0.418	0.281	0.2465	
720 minute winter	S14	1.011	S15	5.0	0.284	0.281	0.3697	
720 minute winter	S15	1.009	OUTFALL	5.0	0.284	0.281	0.1081	90.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	S3C - CP	570	30.641	0.605	6.7	41.1181	0.0000	SURCHARGED
720 minute winter	S3B - CP	570	30.641	0.782	5.8	0.2214	0.0000	SURCHARGED
720 minute winter	S3A - CP	570	30.641	0.966	15.5	56.6936	0.0000	FLOOD RISK
720 minute winter	S15 - CP	570	30.641	0.714	2.2	11.5520	0.0000	SURCHARGED
720 minute winter	S16 - CP	570	30.641	1.008	1.8	0.2853	0.0000	SURCHARGED
720 minute winter	S3 - CP	570	30.641	1.108	11.7	0.7214	0.0000	SURCHARGED
720 minute winter	S1 - CP	570	30.641	0.338	3.1	24.2879	0.0000	SURCHARGED
720 minute winter	S2 - CP	570	30.641	0.863	1.9	0.2442	0.0000	SURCHARGED
720 minute winter	S4	555	30.641	1.271	10.0	2.3168	0.0000	SURCHARGED
120 minute winter	S5 - CP	74	30.644	1.336	36.8	2.6678	0.0000	SURCHARGED
60 minute winter	S6A	42	30.712	0.212	4.6	0.0600	0.0000	SURCHARGED
120 minute winter	S6	74	30.708	0.708	17.6	1.7492	0.0000	SURCHARGED
120 minute winter	S7A	74	30.705	0.905	17.6	1.0231	0.0000	SURCHARGED
120 minute winter	S7	74	30.703	0.903	28.9	1.9488	0.0000	SURCHARGED
120 minute winter	S8 - CP	74	30.683	1.233	35.9	2.1048	0.0000	SURCHARGED
120 minute winter	S9	74	30.664	1.034	19.6	1.7526	0.0000	SURCHARGED
120 minute winter	S10 - CP	74	30.663	1.213	15.5	1.3717	0.0000	SURCHARGED
120 minute winter	S11	74	30.661	1.403	72.1	2.4794	0.0000	SURCHARGED
120 minute winter	S12	74	30.661	1.445	71.2	1.6339	0.0000	FLOOD RISK
120 minute winter	S13 - FCC	74	30.661	1.462	70.6	109.0491	0.0000	SURCHARGED
120 minute winter	S14	66	29.980	0.921	5.0	1.0414	0.0000	SURCHARGED
30 minute winter	S15	26	29.952	1.103	5.4	1.2474	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	29.938	1.150	0.0	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)
720 minute winter	S3C - CP	1.000	S3B - CP	-5.7	0.488	-0.322	0.3120	
720 minute winter	S3B - CP	1.001	S3A - CP	-5.8	0.462	-0.325	0.1916	
720 minute winter	S3A - CP	1.002	S3 - CP	-11.6	0.454	-0.292	0.9584	
720 minute winter	S15 - CP	2.000	S16 - CP	-1.7	0.411	-0.098	0.3835	
720 minute winter	S16 - CP	2.001	S3 - CP	-1.8	0.094	-0.044	0.6753	
720 minute winter	S3 - CP	1.003	S4	-9.9	0.500	-0.249	0.5977	
720 minute winter	S1 - CP	3.000	S2 - CP	-1.9	0.564	-0.104	0.9245	
720 minute winter	S2 - CP	3.001	S4	-1.9	0.539	-0.105	0.0579	
720 minute winter	S4	1.004	S5 - CP	-8.2	0.393	-0.116	1.0563	
120 minute winter	S5 - CP	1.005	S11	-33.7	-0.479	-0.472	0.8450	
60 minute winter	S6A	1.000_1	S6	-4.6	-0.263	-0.174	0.2774	
120 minute winter	S6	4.000	S7A	17.6	0.675	0.150	1.2675	
120 minute winter	S7A	1.002_1	S7	16.3	0.811	0.148	0.4298	
120 minute winter	S7	4.001	S8 - CP	27.0	1.021	0.247	2.5351	
120 minute winter	S8 - CP	4.002	S11	34.6	0.546	0.326	1.4728	
120 minute winter	S9	5.000	S10 - CP	-10.2	0.709	-0.104	1.6196	
120 minute winter	S10 - CP	5.001	S11	-15.5	0.258	-0.154	1.6477	
120 minute winter	S11	1.006	S12	71.2	1.011	0.992	0.7042	
120 minute winter	S12	1.007	S13 - FCC	70.6	1.600	0.979	0.2817	
120 minute winter	S13 - FCC	1.008	S14	5.0	0.666	0.282	0.2465	
120 minute winter	S14	1.011	S15	5.0	0.438	0.282	0.3697	
30 minute winter	S15	1.009	OUTFALL	5.4	0.306	0.304	0.1081	38.9