


Coopers		Page 1
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph TENDER SW Design	
Date 04/05/2022 File 7866 SW06 +HQ SITE.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method














Design Criteria for 7866 SW02.SWS

Pipe Sizes 7866 SW01 Manhole Sizes 7866 SW01

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	17.000	Add Flow / Climate Change (%)	10
Ratio R	0.350	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	0	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	400

Designed with Level Soffits

Network Design Table for 7866 SW02.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	27.121	0.271	100.1	0.173	5.00	0.0	0.600	o	375	Pipe/Conduit	
1.001	18.846	0.188	100.0	0.069	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	17.068	0.071	240.0	0.088	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	10.621	0.044	240.0	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.002	21.134	0.080	263.7	0.138	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.003	17.135	0.071	240.0	0.026	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.000	16.189	0.095	170.4	0.063	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	30.629	0.128	239.3	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.002	14.356	0.060	239.3	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.003	16.397	0.068	241.1	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.004	13.050	0.054	241.7	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.004	31.503	0.131	240.5	0.076	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.005	31.696	0.132	240.0	0.059	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.25	44.751	0.173	0.0	0.0	0.0	1.81	200.0	0.0
1.001	0.00	5.42	44.480	0.242	0.0	0.0	0.0	1.81	200.1	0.0
2.000	0.00	5.28	44.894	0.088	0.0	0.0	0.0	1.01	71.4	0.0
2.001	0.00	5.46	44.823	0.113	0.0	0.0	0.0	1.01	71.4	0.0
2.002	0.00	5.77	44.704	0.251	0.0	0.0	0.0	1.11	122.7	0.0
2.003	0.00	6.02	44.625	0.277	0.0	0.0	0.0	1.17	128.7	0.0
3.000	0.00	5.27	45.109	0.063	0.0	0.0	0.0	1.00	39.7	0.0
3.001	0.00	5.71	44.864	0.126	0.0	0.0	0.0	1.17	128.9	0.0
3.002	0.00	5.91	44.736	0.189	0.0	0.0	0.0	1.17	128.9	0.0
3.003	0.00	6.15	44.676	0.252	0.0	0.0	0.0	1.16	128.4	0.0
3.004	0.00	6.34	44.608	0.315	0.0	0.0	0.0	1.16	128.2	0.0
2.004	0.00	6.79	44.554	0.668	0.0	0.0	0.0	1.16	128.6	0.0
2.005	0.00	7.24	44.423	0.727	0.0	0.0	0.0	1.17	128.7	0.0

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Network Design Table for 7866 SW02.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.002	22.180	0.069	321.4	0.052	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	36.304	0.113	321.3	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	17.926	0.056	320.1	0.153	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	15.365	0.048	320.1	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	26.302	0.082	320.8	0.034	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	30.708	0.096	319.9	0.136	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	54.746	0.171	320.2	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	12.009	0.038	316.0	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	10.371	0.061	170.0	0.094	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	10.100	0.101	100.0	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	11.394	0.068	167.6	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	11.662	0.070	166.6	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	42.988	0.258	166.6	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.010	33.637	0.084	400.4	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	16.468	0.041	401.7	0.033	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.012	27.632	0.069	400.5	0.091	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.013	12.466	0.031	402.1	0.033	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.014	22.528	1.317	17.1	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.015	36.870	1.754	21.0	0.080	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	30.071	1.230	24.4	0.078	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	13.131	0.077	170.5	0.099	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.002	0.00	7.57	44.216	1.021	0.0	0.0	0.0	1.13	179.5	0.0
1.003	0.00	8.10	44.147	1.121	0.0	0.0	0.0	1.13	179.5	0.0
1.004	0.00	8.37	44.033	1.274	0.0	0.0	0.0	1.13	179.9	0.0
1.005	0.00	8.59	43.977	1.286	0.0	0.0	0.0	1.13	179.9	0.0
1.006	0.00	8.98	43.929	1.320	0.0	0.0	0.0	1.13	179.7	0.0
1.007	0.00	9.43	43.847	1.456	0.0	0.0	0.0	1.13	179.9	0.0
1.008	0.00	10.24	43.751	1.556	0.0	0.0	0.0	1.13	179.8	0.0
1.009	0.00	10.42	43.580	1.577	0.0	0.0	0.0	1.14	181.0	0.0
4.000	0.00	5.17	44.225	0.094	0.0	0.0	0.0	1.00	39.8	0.0
5.000	0.00	5.17	44.340	0.013	0.0	0.0	0.0	1.00	17.8	0.0
4.001	0.00	5.36	44.164	0.132	0.0	0.0	0.0	1.01	40.0	0.0
4.002	0.00	5.55	44.096	0.163	0.0	0.0	0.0	1.01	40.2	0.0
4.003	0.00	6.26	44.026	0.198	0.0	0.0	0.0	1.01	40.2	0.0
1.010	0.00	10.97	43.542	1.821	0.0	0.0	0.0	1.01	160.6	0.0
1.011	0.00	11.24	43.458	1.854	0.0	0.0	0.0	1.01	160.3	0.0
1.012	0.00	11.70	43.417	1.945	0.0	0.0	0.0	1.01	160.6	0.0
1.013	0.00	11.91	43.348	1.978	0.0	0.0	0.0	1.01	160.3	0.0
1.014	0.00	11.98	43.317	2.056	0.0	0.0	0.0	4.93	784.8	0.0
1.015	0.00	12.12	42.000	2.136	0.0	0.0	0.0	4.45	707.7	0.0
6.000	0.00	5.19	43.330	0.078	0.0	0.0	0.0	2.66	105.7	0.0
6.001	0.00	5.41	42.100	0.177	0.0	0.0	0.0	1.00	39.7	0.0

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TENDER
SW Design



Date 04/05/2022

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File 7866 SW06 +HQ SITE.MDX

Checked by AJ

Micro Drainage

Network 2020.1.3

Network Design Table for 7866 SW02.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
6.002	25.867	0.152	170.2	0.039	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.003	35.951	1.342	26.8	0.065	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.004	14.027	0.058	241.8	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.016	84.016	0.420	200.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.017	13.345	0.575	23.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.018	56.795	0.950	59.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.019	52.602	0.314	167.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.020	21.416	0.676	31.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.002	0.00	5.77	41.948	0.216	0.0	0.0	0.0	1.20	85.0	0.0
6.003	0.00	5.96	41.796	0.281	0.0	0.0	0.0	3.05	215.6	0.0
6.004	0.00	6.20	40.454	0.295	0.0	0.0	0.0	1.01	71.2	0.0
1.016	0.00	13.10	39.520	2.431	0.0	0.0	0.0	1.43	228.0	0.0
1.017	0.00	13.18	39.100	2.431	0.0	0.0	0.0	2.73	108.5	0.0
1.018	0.00	13.74	38.525	2.431	0.0	0.0	0.0	1.69	67.4	0.0
1.019	0.00	14.61	37.575	2.431	0.0	0.0	0.0	1.01	40.1	0.0
1.020	0.00	14.76	37.261	2.431	0.0	0.0	0.0	2.33	92.8	0.0

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Network 2020.1.3

Manhole Schedules for 7866 SW02.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	46.924	2.173	Open Manhole	1500	1.000	44.751	375				
2	46.940	2.460	Open Manhole	1500	1.001	44.480	375	1.000	44.480	375	
3	47.224	2.330	Open Manhole	1200	2.000	44.894	300				
4	47.033	2.210	Open Manhole	1200	2.001	44.823	300	2.000	44.823	300	
5	46.974	2.270	Open Manhole	1500	2.002	44.704	375	2.001	44.779	300	
6	47.113	2.490	Open Manhole	1500	2.003	44.625	375	2.002	44.623	375	
101	47.013	1.904	Open Manhole	1200	3.000	45.109	225				
102	47.200	2.336	Open Manhole	1500	3.001	44.864	375	3.000	45.014	225	
103	47.500	2.764	Open Manhole	1500	3.002	44.736	375	3.001	44.736	375	
104	47.650	2.974	Open Manhole	1500	3.003	44.676	375	3.002	44.676	375	
105	47.622	3.014	Open Manhole	1500	3.004	44.608	375	3.003	44.608	375	
7	47.463	2.909	Open Manhole	1500	2.004	44.554	375	2.003	44.554	375	
								3.004	44.554	375	
8	47.077	2.654	Open Manhole	1500	2.005	44.423	375	2.004	44.423	375	
9	47.171	2.955	Open Manhole	1500	1.002	44.216	450	1.001	44.292	375	1
								2.005	44.291	375	
10	47.488	3.341	Open Manhole	1500	1.003	44.147	450	1.002	44.147	450	
11	47.900	3.867	Open Manhole	1500	1.004	44.033	450	1.003	44.034	450	1
12	48.200	4.223	Open Manhole	1500	1.005	43.977	450	1.004	43.977	450	
13	48.542	4.613	Open Manhole	1500	1.006	43.929	450	1.005	43.929	450	
14	48.377	4.530	Open Manhole	1500	1.007	43.847	450	1.006	43.847	450	
15	48.000	4.249	Open Manhole	1500	1.008	43.751	450	1.007	43.751	450	
16	47.316	3.736	Open Manhole	1500	1.009	43.580	450	1.008	43.580	450	
17	46.100	1.875	Open Manhole	1200	4.000	44.225	225				
18A	45.929	1.589	Open Manhole	1200	5.000	44.340	150				
18	46.231	2.067	Open Manhole	1200	4.001	44.164	225	4.000	44.164	225	
								5.000	44.239	150	
19	46.465	2.369	Open Manhole	1200	4.002	44.096	225	4.001	44.096	225	
20	46.627	2.601	Open Manhole	1200	4.003	44.026	225	4.002	44.026	225	
21	47.158	3.616	Open Manhole	1500	1.010	43.542	450	1.009	43.542	450	
								4.003	43.768	225	1
22	45.991	2.533	Open Manhole	1500	1.011	43.458	450	1.010	43.458	450	
23	45.363	1.946	Open Manhole	1500	1.012	43.417	450	1.011	43.417	450	
24	45.512	2.164	Open Manhole	1500	1.013	43.348	450	1.012	43.348	450	
25	45.666	2.349	Open Manhole	1500	1.014	43.317	450	1.013	43.317	450	
26	43.650	1.650	Open Manhole	1500	1.015	42.000	450	1.014	42.000	450	
27	45.205	1.875	Open Manhole	1200	6.000	43.330	225				
28	44.024	1.924	Open Manhole	1200	6.001	42.100	225	6.000	42.100	225	
29	44.000	2.052	Open Manhole	1200	6.002	41.948	300	6.001	42.023	225	
30	43.500	1.704	Open Manhole	1200	6.003	41.796	300	6.002	41.796	300	
31	42.300	1.846	Open Manhole	1200	6.004	40.454	300	6.003	40.454	300	
32	42.300	2.780	Open Manhole	1800	1.016	39.520	450	1.015	40.246	450	726
								6.004	40.396	300	726
33	41.200	2.100	Open Manhole	2400	1.017	39.100	225	1.016	39.100	450	

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Manhole Schedules for 7866 SW02.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Invert Level (m)	Diameter (mm)	Pipes In PN	Invert Level (m)	Diameter (mm)	Backdrop (mm)
34	39.950	1.425	Open Manhole	1200	1.018	38.525	225	1.017	38.525	225	
35	39.000	1.425	Open Manhole	1200	1.019	37.575	225	1.018	37.575	225	
36	38.750	1.489	Open Manhole	1200	1.020	37.261	225	1.019	37.261	225	
37	38.010	1.425	Open Manhole	1500		OUTFALL		1.020	36.585	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	304559.701	373576.902	304559.701	373576.902	Required	
2	304533.097	373571.633	304533.097	373571.633	Required	
3	304535.074	373664.275	304535.074	373664.275	Required	
4	304540.219	373648.001	304540.219	373648.001	Required	
5	304543.242	373637.837	304543.242	373637.837	Required	
6	304522.550	373633.538	304522.550	373633.538	Required	
101	304486.105	373704.526	304486.105	373704.526	Required	
102	304472.274	373696.114	304472.274	373696.114	Required	
103	304488.876	373670.373	304488.876	373670.373	Required	
104	304496.637	373658.295	304496.637	373658.295	Required	
105	304502.721	373643.068	304502.721	373643.068	Required	
7	304505.711	373630.365	304505.711	373630.365	Required	
8	304508.690	373598.890	304508.690	373598.890	Required	
9	304514.653	373567.760	304514.653	373567.760	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
10	304492.900	373563.429	304492.900	373563.429	Required	
11	304457.295	373556.340	304457.295	373556.340	Required	
12	304439.755	373552.638	304439.755	373552.638	Required	
13	304425.681	373546.475	304425.681	373546.475	Required	
14	304400.181	373540.032	304400.181	373540.032	Required	
15	304393.034	373569.896	304393.034	373569.896	Required	
16	304379.607	373622.971	304379.607	373622.971	Required	
17	304334.030	373691.760	304334.030	373691.760	Required	
18	304334.030	373681.390	304334.030	373681.390	Required	
19	304345.200	373679.144	304345.200	373679.144	Required	
20	304354.156	373671.674	304354.156	373671.674	Required	
21	304374.863	373634.002	304374.863	373634.002	Required	
22	304344.636	373619.244	304344.636	373619.244	Required	
23	304328.407	373616.450	304328.407	373616.450	Required	
24	304327.752	373588.825	304327.752	373588.825	Required	
25	304326.751	373576.400	304326.751	373576.400	Required	
26	304304.886	373570.973	304304.886	373570.973	Required	
27	304303.554	373670.976	304303.554	373670.976	Required	

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Manhole Schedules for 7866 SW02.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
28	304273.526	373669.373	304273.526	373669.373	Required	
29	304274.098	373656.255	304274.098	373656.255	Required	
30	304270.767	373630.604	304270.767	373630.604	Required	
31	304261.398	373595.895	304261.398	373595.895	Required	
32	304271.123	373585.787	304271.123	373585.787	Required	
33	304237.365	373508.851	304237.365	373508.851	Required	
34	304226.387	373501.263	304226.387	373501.263	Required	
35	304215.064	373445.608	304215.064	373445.608	Required	
36	304212.339	373393.077	304212.339	373393.077	Required	
37	304211.626	373371.673			No Entry	

Park House
Sandpiper Court
Chester CH4 9QU

Upper Denbigh Road, St Asaph
TENDER
SW Design

Date 04/05/2022
File 7866 SW06 +HQ SITE.MDX

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Micro Drainage

Network 2020.1.3

PIPELINE SCHEDULES for 7866 SW02.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	375	1	46.924	44.751	1.798	Open Manhole	1500
1.001	o	375	2	46.940	44.480	2.085	Open Manhole	1500
2.000	o	300	3	47.224	44.894	2.030	Open Manhole	1200
2.001	o	300	4	47.033	44.823	1.910	Open Manhole	1200
2.002	o	375	5	46.974	44.704	1.895	Open Manhole	1500
2.003	o	375	6	47.113	44.625	2.113	Open Manhole	1500
3.000	o	225	101	47.013	45.109	1.679	Open Manhole	1200
3.001	o	375	102	47.200	44.864	1.961	Open Manhole	1500
3.002	o	375	103	47.500	44.736	2.389	Open Manhole	1500
3.003	o	375	104	47.650	44.676	2.599	Open Manhole	1500
3.004	o	375	105	47.622	44.608	2.639	Open Manhole	1500
2.004	o	375	7	47.463	44.554	2.534	Open Manhole	1500
2.005	o	375	8	47.077	44.423	2.279	Open Manhole	1500
1.002	o	450	9	47.171	44.216	2.505	Open Manhole	1500
1.003	o	450	10	47.488	44.147	2.891	Open Manhole	1500
1.004	o	450	11	47.900	44.033	3.417	Open Manhole	1500
1.005	o	450	12	48.200	43.977	3.773	Open Manhole	1500
1.006	o	450	13	48.542	43.929	4.163	Open Manhole	1500
1.007	o	450	14	48.377	43.847	4.080	Open Manhole	1500
1.008	o	450	15	48.000	43.751	3.799	Open Manhole	1500
1.009	o	450	16	47.316	43.580	3.286	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	27.121	100.1	2	46.940	44.480	2.085	Open Manhole	1500
1.001	18.846	100.0	9	47.171	44.292	2.504	Open Manhole	1500
2.000	17.068	240.0	4	47.033	44.823	1.910	Open Manhole	1200
2.001	10.621	240.0	5	46.974	44.779	1.895	Open Manhole	1500
2.002	21.134	263.7	6	47.113	44.623	2.115	Open Manhole	1500
2.003	17.135	240.0	7	47.463	44.554	2.534	Open Manhole	1500
3.000	16.189	170.4	102	47.200	45.014	1.961	Open Manhole	1500
3.001	30.629	239.3	103	47.500	44.736	2.389	Open Manhole	1500
3.002	14.356	239.3	104	47.650	44.676	2.599	Open Manhole	1500
3.003	16.397	241.1	105	47.622	44.608	2.639	Open Manhole	1500
3.004	13.050	241.7	7	47.463	44.554	2.534	Open Manhole	1500
2.004	31.503	240.5	8	47.077	44.423	2.279	Open Manhole	1500
2.005	31.696	240.0	9	47.171	44.291	2.505	Open Manhole	1500
1.002	22.180	321.4	10	47.488	44.147	2.891	Open Manhole	1500
1.003	36.304	321.3	11	47.900	44.034	3.416	Open Manhole	1500
1.004	17.926	320.1	12	48.200	43.977	3.773	Open Manhole	1500
1.005	15.365	320.1	13	48.542	43.929	4.163	Open Manhole	1500
1.006	26.302	320.8	14	48.377	43.847	4.080	Open Manhole	1500
1.007	30.708	319.9	15	48.000	43.751	3.799	Open Manhole	1500
1.008	54.746	320.2	16	47.316	43.580	3.286	Open Manhole	1500
1.009	12.009	316.0	21	47.158	43.542	3.166	Open Manhole	1500

Park House
Sandpiper Court
Chester CH4 9QU

Upper Denbigh Road, St Asaph
TENDER
SW Design



Date 04/05/2022

Designed by Coopers

File 7866 SW06 +HQ SITE.MDX

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Network 2020.1.3

PIPELINE SCHEDULES for 7866 SW02.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.000	o	225	17	46.100	44.225	1.650	Open Manhole	1200
5.000	o	150	18A	45.929	44.340	1.439	Open Manhole	1200
4.001	o	225	18	46.231	44.164	1.842	Open Manhole	1200
4.002	o	225	19	46.465	44.096	2.144	Open Manhole	1200
4.003	o	225	20	46.627	44.026	2.376	Open Manhole	1200
1.010	o	450	21	47.158	43.542	3.166	Open Manhole	1500
1.011	o	450	22	45.991	43.458	2.083	Open Manhole	1500
1.012	o	450	23	45.363	43.417	1.496	Open Manhole	1500
1.013	o	450	24	45.512	43.348	1.714	Open Manhole	1500
1.014	o	450	25	45.666	43.317	1.899	Open Manhole	1500
1.015	o	450	26	43.650	42.000	1.200	Open Manhole	1500
6.000	o	225	27	45.205	43.330	1.650	Open Manhole	1200
6.001	o	225	28	44.024	42.100	1.699	Open Manhole	1200
6.002	o	300	29	44.000	41.948	1.752	Open Manhole	1200
6.003	o	300	30	43.500	41.796	1.404	Open Manhole	1200
6.004	o	300	31	42.300	40.454	1.546	Open Manhole	1200
1.016	o	450	32	42.300	39.520	2.330	Open Manhole	1800
1.017	o	225	33	41.200	39.100	1.875	Open Manhole	2400
1.018	o	225	34	39.950	38.525	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.000	10.371	170.0	18	46.231	44.164	1.842	Open Manhole	1200
5.000	10.100	100.0	18	46.231	44.239	1.842	Open Manhole	1200
4.001	11.394	167.6	19	46.465	44.096	2.144	Open Manhole	1200
4.002	11.662	166.6	20	46.627	44.026	2.376	Open Manhole	1200
4.003	42.988	166.6	21	47.158	43.768	3.165	Open Manhole	1500
1.010	33.637	400.4	22	45.991	43.458	2.083	Open Manhole	1500
1.011	16.468	401.7	23	45.363	43.417	1.496	Open Manhole	1500
1.012	27.632	400.5	24	45.512	43.348	1.714	Open Manhole	1500
1.013	12.466	402.1	25	45.666	43.317	1.899	Open Manhole	1500
1.014	22.528	17.1	26	43.650	42.000	1.200	Open Manhole	1500
1.015	36.870	21.0	32	42.300	40.246	1.604	Open Manhole	1800
6.000	30.071	24.4	28	44.024	42.100	1.699	Open Manhole	1200
6.001	13.131	170.5	29	44.000	42.023	1.752	Open Manhole	1200
6.002	25.867	170.2	30	43.500	41.796	1.404	Open Manhole	1200
6.003	35.951	26.8	31	42.300	40.454	1.546	Open Manhole	1200
6.004	14.027	241.8	32	42.300	40.396	1.604	Open Manhole	1800
1.016	84.016	200.0	33	41.200	39.100	1.650	Open Manhole	2400
1.017	13.345	23.2	34	39.950	38.525	1.200	Open Manhole	1200
1.018	56.795	59.8	35	39.000	37.575	1.200	Open Manhole	1200

Park House
Sandpiper Court
Chester CH4 9QU

Upper Denbigh Road, St Asaph
TENDER
SW Design



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File 7866 SW06 +HQ SITE.MDX

Designed by Coopers
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Micro Drainage

Network 2020.1.3

PIPELINE SCHEDULES for 7866 SW02.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.019	o	225	35	39.000	37.575	1.200	Open Manhole	1200
1.020	o	225	36	38.750	37.261	1.264	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.019	52.602	167.5	36	38.750	37.261	1.264	Open Manhole	1200
1.020	21.416	31.7	37	38.010	36.585	1.200	Open Manhole	1500

Free Flowing Outfall Details for 7866 SW02.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.020	37	38.010	36.585	0.000	1500	0


Simulation Criteria for 7866 SW02.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	17.000	Storm Duration (mins)	30
Ratio R	0.350		

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Online Controls for 7866 SW02.SWS


Hydro-Brake® Optimum Manhole: 33, DS/PN: 1.017, Volume (m³): 22.5

Unit Reference	MD-SHE-0164-1350-1200-1350
Design Head (m)	1.200
Design Flow (l/s)	13.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	164
Invert Level (m)	39.100
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	13.5	Kick-Flo®	0.796	11.1
Flush-Flo™	0.360	13.5	Mean Flow over Head Range	-	11.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	0.800	11.2	2.000	17.2	4.000	24.0	7.000	31.4
0.200	12.7	1.000	12.4	2.200	18.0	4.500	25.4	7.500	32.4
0.300	13.4	1.200	13.5	2.400	18.8	5.000	26.7	8.000	33.5
0.400	13.5	1.400	14.5	2.600	19.5	5.500	27.9	8.500	34.5
0.500	13.3	1.600	15.5	3.000	20.9	6.000	29.1	9.000	35.4
0.600	12.9	1.800	16.4	3.500	22.5	6.500	30.3	9.500	36.4

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Storage Structures for 7866 SW02.SWS

Cellular Storage Manhole: 102, DS/PN: 3.001

Invert Level (m) 45.650 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	48.0	48.0	0.800	48.0	73.6	0.801	0.0	73.6

Tank or Pond Manhole: 33, DS/PN: 1.017

Invert Level (m) 39.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	670.0	1.200	1240.0	2.400	0.0	3.600	0.0	4.800	0.0
0.200	760.0	1.400	1350.0	2.600	0.0	3.800	0.0	5.000	0.0
0.400	850.0	1.600	0.0	2.800	0.0	4.000	0.0		
0.600	940.0	1.800	0.0	3.000	0.0	4.200	0.0		
0.800	1040.0	2.000	0.0	3.200	0.0	4.400	0.0		
1.000	1140.0	2.200	0.0	3.400	0.0	4.600	0.0		

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Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m ³)	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
1.000	1	3.840	2.995	0.000	6.835
1.001	2	4.347	2.081	0.000	6.429
2.000	3	2.635	1.206	0.000	3.842
2.001	4	2.500	0.751	0.000	3.250
2.002	5	4.012	2.334	0.000	6.346
2.003	6	4.397	1.893	0.000	6.289
3.000	101	2.153	0.644	0.000	2.797
3.001	102	4.128	3.383	36.495	44.006
3.002	103	4.884	1.586	0.000	6.470
3.003	104	5.255	1.811	0.000	7.066
3.004	105	5.326	1.441	0.000	6.768
2.004	7	5.141	3.479	0.000	8.621
2.005	8	4.691	3.501	0.000	8.191
1.002	9	5.222	3.528	0.000	8.749
1.003	10	5.904	5.774	0.000	11.678
1.004	11	6.834	2.851	0.000	9.685
1.005	12	7.463	2.444	0.000	9.906
1.006	13	8.152	4.183	0.000	12.335
1.007	14	8.005	4.884	0.000	12.889
1.008	15	7.509	8.707	0.000	16.216
1.009	16	6.602	1.910	0.000	8.512
4.000	17	2.121	0.412	0.000	2.533
5.000	18A	1.797	0.178	0.000	1.976
4.001	18	2.338	0.453	0.000	2.791
4.002	19	2.679	0.464	0.000	3.143
4.003	20	2.942	1.709	0.000	4.651
1.010	21	6.390	5.350	0.000	11.740
1.011	22	4.476	2.619	0.000	7.095
1.012	23	3.439	4.395	0.000	7.834
1.013	24	3.824	1.983	0.000	5.807
1.014	25	4.151	3.583	0.000	7.734
1.015	26	2.916	5.864	0.000	8.780
6.000	27	2.121	1.196	0.000	3.316
6.001	28	2.176	0.522	0.000	2.698
6.002	29	2.321	1.828	0.000	4.149
6.003	30	1.927	2.541	0.000	4.468
6.004	31	2.088	0.992	0.000	3.079
1.016	32	7.074	13.362	0.000	20.436
1.017	33	9.500	0.531	1485.437	1495.468
1.018	34	1.612	2.258	0.000	3.870
1.019	35	1.612	2.091	0.000	3.703
1.020	36	1.684	0.852	0.000	2.536
Total		178.186	114.568	1521.933	1814.687

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m ³)
1.000	1	15 Winter	1	+0%	30/15 Winter				44.834	-0.292	0.000
1.001	2	15 Winter	1	+0%	30/15 Summer				44.579	-0.276	0.000
2.000	3	15 Winter	1	+0%	30/15 Summer				44.975	-0.219	0.000
2.001	4	15 Winter	1	+0%	30/15 Summer				44.918	-0.205	0.000
2.002	5	15 Winter	1	+0%	30/15 Summer				44.835	-0.244	0.000
2.003	6	15 Winter	1	+0%	30/15 Summer				44.779	-0.221	0.000
3.000	101	15 Winter	1	+0%	30/15 Winter				45.178	-0.156	0.000
3.001	102	15 Winter	1	+0%	30/15 Summer				44.949	-0.290	0.000
3.002	103	15 Winter	1	+0%	30/15 Summer				44.849	-0.262	0.000
3.003	104	15 Winter	1	+0%	30/15 Summer				44.810	-0.241	0.000
3.004	105	15 Winter	1	+0%	30/15 Summer				44.773	-0.210	0.000
2.004	7	15 Winter	1	+0%	30/15 Summer				44.750	-0.178	0.000
2.005	8	15 Winter	1	+0%	30/15 Summer				44.627	-0.171	0.000
1.002	9	15 Winter	1	+0%	30/15 Summer				44.472	-0.194	0.000
1.003	10	15 Winter	1	+0%	30/15 Summer				44.406	-0.191	0.000
1.004	11	15 Winter	1	+0%	30/15 Summer				44.324	-0.159	0.000
1.005	12	15 Winter	1	+0%	30/15 Summer				44.269	-0.158	0.000
1.006	13	15 Winter	1	+0%	30/15 Summer				44.207	-0.172	0.000
1.007	14	15 Winter	1	+0%	30/15 Summer				44.126	-0.171	0.000
1.008	15	30 Winter	1	+0%	30/15 Summer				44.071	-0.130	0.000
1.009	16	30 Winter	1	+0%	30/15 Summer				44.010	-0.020	0.000
4.000	17	15 Winter	1	+0%	30/15 Summer				44.312	-0.138	0.000
5.000	18A	15 Winter	1	+0%	30/15 Summer				44.371	-0.119	0.000
4.001	18	15 Winter	1	+0%	30/15 Summer				44.267	-0.122	0.000
4.002	19	15 Winter	1	+0%	30/15 Summer				44.210	-0.111	0.000
4.003	20	15 Winter	1	+0%	30/15 Summer				44.144	-0.107	0.000
1.010	21	30 Winter	1	+0%	30/15 Summer				43.964	-0.028	0.000
1.011	22	30 Winter	1	+0%	30/15 Summer				43.887	-0.021	0.000

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Micro Drainage

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
				Time (mins)	Flow (l/s)		
1.000	1	0.11			19.2	OK	
1.001	2	0.16			25.8	OK	
2.000	3	0.16			9.7	OK	
2.001	4	0.22			12.2	OK	
2.002	5	0.24			24.9	OK	
2.003	6	0.25			26.5	OK	
3.000	101	0.20			7.0	OK	
3.001	102	0.11		7	13.0	OK	
3.002	103	0.18			18.4	OK	
3.003	104	0.23			23.8	OK	
3.004	105	0.29			29.1	OK	
2.004	7	0.54			61.1	OK	
2.005	8	0.57			65.1	OK	
1.002	9	0.59			87.5	OK	
1.003	10	0.59			92.8	OK	
1.004	11	0.71			100.7	OK	
1.005	12	0.75			101.5	OK	
1.006	13	0.67			102.0	OK	
1.007	14	0.70			108.0	OK	
1.008	15	0.64			105.2	OK	
1.009	16	0.79			101.1	OK	
4.000	17	0.32			10.5	OK	
5.000	18A	0.09			1.5	OK	
4.001	18	0.42			14.3	OK	
4.002	19	0.51			17.4	OK	
4.003	20	0.54			20.6	OK	
1.010	21	0.79			110.8	OK	
1.011	22	0.94			106.5	OK	

Park House
Sandpiper Court
Chester CH4 9QU

Upper Denbigh Road, St Asaph
TENDER
SW Design

Date 04/05/2022
File 7866 SW06 +HQ SITE.MDX

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Micro Drainage

Network 2020.1.3

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
1.012	23	30	Winter	1	+0%	30/15	Summer		43.834	-0.033
1.013	24	30	Winter	1	+0%	30/15	Summer		43.759	-0.039
1.014	25	30	Winter	1	+0%				43.438	-0.329
1.015	26	30	Winter	1	+0%				42.126	-0.324
6.000	27	15	Winter	1	+0%				43.375	-0.180
6.001	28	15	Winter	1	+0%	30/15	Summer		42.218	-0.107
6.002	29	15	Winter	1	+0%	100/15	Summer		42.058	-0.190
6.003	30	15	Winter	1	+0%				41.871	-0.225
6.004	31	15	Winter	1	+0%	30/15	Summer		40.603	-0.151
1.016	32	30	Winter	1	+0%	30/15	Summer		39.764	-0.206
1.017	33	360	Winter	1	+0%	1/60	Summer		39.429	0.104
1.018	34	1440	Winter	1	+0%				38.592	-0.158
1.019	35	1440	Winter	1	+0%				37.664	-0.136
1.020	36	1440	Winter	1	+0%				37.319	-0.167

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Flow (l/s)	Time (mins)	Flow (l/s)		
1.012	23	0.000	0.78			106.1	OK	
1.013	24	0.000	1.00			101.8	OK	
1.014	25	0.000	0.16			104.8	OK	
1.015	26	0.000	0.17			108.1	OK	
6.000	27	0.000	0.09			8.8	OK	
6.001	28	0.000	0.53			18.1	OK	
6.002	29	0.000	0.29			21.9	OK	
6.003	30	0.000	0.14			28.0	OK	
6.004	31	0.000	0.49			29.2	OK	
1.016	32	0.000	0.56			121.3	OK	
1.017	33	0.000	0.14			12.8	SURCHARGED	
1.018	34	0.000	0.20			12.8	OK	
1.019	35	0.000	0.33			12.8	OK	
1.020	36	0.000	0.15			12.8	OK	

Park House
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TENDER
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Micro Drainage

Network 2020.1.3

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866
SW02.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m ³)
1.000	1	30 Winter	30	+0%	30/15 Winter				45.342	0.216	0.000
1.001	2	30 Winter	30	+0%	30/15 Summer				45.326	0.471	0.000
2.000	3	30 Winter	30	+0%	30/15 Summer				45.608	0.414	0.000
2.001	4	30 Winter	30	+0%	30/15 Summer				45.599	0.476	0.000
2.002	5	30 Winter	30	+0%	30/15 Summer				45.591	0.512	0.000
2.003	6	30 Winter	30	+0%	30/15 Summer				45.515	0.515	0.000
3.000	101	30 Winter	30	+0%	30/15 Winter				45.606	0.272	0.000
3.001	102	30 Winter	30	+0%	30/15 Summer				45.592	0.353	0.000
3.002	103	30 Winter	30	+0%	30/15 Summer				45.583	0.472	0.000
3.003	104	30 Winter	30	+0%	30/15 Summer				45.573	0.522	0.000
3.004	105	30 Winter	30	+0%	30/15 Summer				45.512	0.529	0.000
2.004	7	30 Winter	30	+0%	30/15 Summer				45.423	0.494	0.000
2.005	8	30 Winter	30	+0%	30/15 Summer				45.323	0.525	0.000
1.002	9	30 Winter	30	+0%	30/15 Summer				45.223	0.557	0.000
1.003	10	30 Winter	30	+0%	30/15 Summer				45.167	0.570	0.000
1.004	11	15 Winter	30	+0%	30/15 Summer				45.082	0.599	0.000
1.005	12	15 Winter	30	+0%	30/15 Summer				45.017	0.590	0.000
1.006	13	30 Winter	30	+0%	30/15 Summer				44.968	0.589	0.000
1.007	14	30 Winter	30	+0%	30/15 Summer				44.876	0.579	0.000
1.008	15	30 Winter	30	+0%	30/15 Summer				44.771	0.570	0.000
1.009	16	30 Winter	30	+0%	30/15 Summer				44.569	0.539	0.000
4.000	17	30 Winter	30	+0%	30/15 Summer				44.683	0.233	0.000
5.000	18A	30 Winter	30	+0%	30/15 Summer				44.668	0.178	0.000
4.001	18	30 Winter	30	+0%	30/15 Summer				44.664	0.275	0.000
4.002	19	30 Winter	30	+0%	30/15 Summer				44.636	0.315	0.000
4.003	20	30 Winter	30	+0%	30/15 Summer				44.577	0.326	0.000
1.010	21	30 Winter	30	+0%	30/15 Summer				44.462	0.470	0.000
1.011	22	30 Winter	30	+0%	30/15 Summer				44.262	0.354	0.000

Park House
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TENDER
SW Design



Date 04/05/2022

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Micro Drainage

Network 2020.1.3

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866
SW02.SWS

PN	US/MH Name	Flow / Cap.	Overflow (1/s)	Half Drain Pipe		Status	Level Exceeded
				Time (mins)	Flow (1/s)		
1.000	1	0.21			37.1	SURCHARGED	
1.001	2	0.27			45.6	SURCHARGED	
2.000	3	0.30			18.5	SURCHARGED	
2.001	4	0.38			21.6	SURCHARGED	
2.002	5	0.46			47.8	SURCHARGED	
2.003	6	0.44			46.5	SURCHARGED	
3.000	101	0.39			13.8	SURCHARGED	
3.001	102	0.23		8	26.3	SURCHARGED	
3.002	103	0.33			33.4	SURCHARGED	
3.003	104	0.41			42.4	SURCHARGED	
3.004	105	0.51			51.3	SURCHARGED	
2.004	7	0.93			106.5	SURCHARGED	
2.005	8	0.91			103.9	SURCHARGED	
1.002	9	0.89			132.0	SURCHARGED	
1.003	10	0.88			139.1	SURCHARGED	
1.004	11	1.30			185.6	SURCHARGED	
1.005	12	1.30			176.6	SURCHARGED	
1.006	13	1.01			153.9	SURCHARGED	
1.007	14	1.11			172.0	SURCHARGED	
1.008	15	1.11			183.3	SURCHARGED	
1.009	16	1.44			185.3	SURCHARGED	
4.000	17	0.57			19.0	SURCHARGED	
5.000	18A	0.17			2.8	SURCHARGED	
4.001	18	0.75			25.7	SURCHARGED	
4.002	19	0.90			30.9	SURCHARGED	
4.003	20	0.93			35.7	SURCHARGED	
1.010	21	1.54			215.3	SURCHARGED	
1.011	22	1.93			218.9	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
1.012	23	30 Winter	30	+0%	30/15 Summer				44.110	0.243
1.013	24	30 Winter	30	+0%	30/15 Summer				43.916	0.118
1.014	25	30 Winter	30	+0%					43.507	-0.260
1.015	26	30 Winter	30	+0%					42.198	-0.252
6.000	27	15 Winter	30	+0%					43.401	-0.154
6.001	28	15 Winter	30	+0%	30/15 Summer				42.407	0.082
6.002	29	15 Winter	30	+0%	100/15 Summer				42.155	-0.093
6.003	30	15 Winter	30	+0%					41.929	-0.167
6.004	31	15 Winter	30	+0%	30/15 Summer				40.803	0.049
1.016	32	30 Winter	30	+0%	30/15 Summer				40.332	0.362
1.017	33	480 Winter	30	+0%	1/60 Summer				39.903	0.578
1.018	34	180 Summer	30	+0%					38.593	-0.157
1.019	35	1440 Summer	30	+0%					37.665	-0.135
1.020	36	1440 Summer	30	+0%					37.320	-0.166

PN	US/MH Name	Flooded		Half Drain		Pipe	Level Exceeded
		Volume (m ³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)	Status	
1.012	23	0.000	1.67		227.9	SURCHARGED	
1.013	24	0.000	2.28		231.6	SURCHARGED	
1.014	25	0.000	0.37		239.5	OK	
1.015	26	0.000	0.40		248.3	OK	
6.000	27	0.000	0.22		21.5	OK	
6.001	28	0.000	1.47		50.4	SURCHARGED	
6.002	29	0.000	0.80		60.6	OK	
6.003	30	0.000	0.39		78.3	OK	
6.004	31	0.000	1.41		83.3	SURCHARGED	
1.016	32	0.000	1.35		290.6	SURCHARGED	
1.017	33	0.000	0.14		13.1	SURCHARGED	
1.018	34	0.000	0.20		13.1	OK	
1.019	35	0.000	0.34		13.1	OK	
1.020	36	0.000	0.16		13.1	OK	

Park House
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TENDER
SW Design



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Micro Drainage

Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866
SW02.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m ³)
1.000	1	15 Winter	100	+30%	30/15 Winter				46.879	1.753	0.000
1.001	2	15 Winter	100	+30%	30/15 Summer				46.758	1.903	0.000
2.000	3	30 Winter	100	+30%	30/15 Summer				47.000	1.806	0.000
2.001	4	30 Winter	100	+30%	30/15 Summer				46.982	1.859	0.000
2.002	5	30 Winter	100	+30%	30/15 Summer				46.949	1.871	0.000
2.003	6	30 Winter	100	+30%	30/15 Summer				46.869	1.869	0.000
3.000	101	30 Winter	100	+30%	30/15 Winter				46.921	1.587	0.000
3.001	102	30 Winter	100	+30%	30/15 Summer				46.899	1.660	0.000
3.002	103	30 Winter	100	+30%	30/15 Summer				46.889	1.778	0.000
3.003	104	30 Winter	100	+30%	30/15 Summer				46.878	1.827	0.000
3.004	105	30 Winter	100	+30%	30/15 Summer				46.815	1.832	0.000
2.004	7	30 Winter	100	+30%	30/15 Summer				46.782	1.854	0.000
2.005	8	30 Winter	100	+30%	30/15 Summer				46.673	1.876	0.000
1.002	9	15 Winter	100	+30%	30/15 Summer				46.610	1.944	0.000
1.003	10	15 Winter	100	+30%	30/15 Summer				46.564	1.967	0.000
1.004	11	15 Winter	100	+30%	30/15 Summer				46.467	1.984	0.000
1.005	12	15 Winter	100	+30%	30/15 Summer				46.341	1.914	0.000
1.006	13	30 Winter	100	+30%	30/15 Summer				46.228	1.849	0.000
1.007	14	30 Winter	100	+30%	30/15 Summer				46.097	1.800	0.000
1.008	15	30 Winter	100	+30%	30/15 Summer				45.890	1.689	0.000
1.009	16	30 Winter	100	+30%	30/15 Summer				45.481	1.451	0.000
4.000	17	30 Winter	100	+30%	30/15 Summer				45.828	1.378	0.000
5.000	18A	30 Winter	100	+30%	30/15 Summer				45.774	1.284	0.000
4.001	18	30 Winter	100	+30%	30/15 Summer				45.766	1.377	0.000
4.002	19	30 Winter	100	+30%	30/15 Summer				45.688	1.367	0.000
4.003	20	30 Winter	100	+30%	30/15 Summer				45.608	1.357	0.000
1.010	21	30 Winter	100	+30%	30/15 Summer				45.268	1.276	0.000
1.011	22	30 Winter	100	+30%	30/15 Summer				44.849	0.941	0.000

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Micro Drainage

Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

PN	US/MH Name	Flow / Cap.	Overflow (1/s)	Half Drain Pipe		Status	Level Exceeded
				Time (mins)	Flow (1/s)		
1.000	1	0.33			56.8	FLOOD RISK	
1.001	2	0.39			64.1	FLOOD RISK	
2.000	3	0.38			22.9	FLOOD RISK	
2.001	4	0.48			26.9	FLOOD RISK	
2.002	5	0.58			60.4	FLOOD RISK	
2.003	6	0.60			63.3	FLOOD RISK	
3.000	101	0.51			18.1	FLOOD RISK	
3.001	102	0.58		13	66.2	SURCHARGED	
3.002	103	0.68			69.1	SURCHARGED	
3.003	104	0.69			72.4	SURCHARGED	
3.004	105	0.76			75.6	SURCHARGED	
2.004	7	0.95			108.8	SURCHARGED	
2.005	8	1.00			114.7	SURCHARGED	
1.002	9	1.13			166.5	SURCHARGED	
1.003	10	1.16			184.0	SURCHARGED	
1.004	11	1.58			226.0	SURCHARGED	
1.005	12	1.59			215.8	SURCHARGED	
1.006	13	1.33			201.6	SURCHARGED	
1.007	14	1.51			234.8	SURCHARGED	
1.008	15	1.56			256.7	SURCHARGED	
1.009	16	2.02			259.8	SURCHARGED	
4.000	17	0.76			25.2	FLOOD RISK	
5.000	18A	0.29			4.6	FLOOD RISK	
4.001	18	0.89			30.3	SURCHARGED	
4.002	19	1.07			36.7	SURCHARGED	
4.003	20	1.14			43.7	SURCHARGED	
1.010	21	2.23			312.4	SURCHARGED	
1.011	22	2.81			317.9	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW02.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m ³)
1.012	23	30 Winter	100	+30%	30/15 Summer				44.530	0.663	0.000
1.013	24	30 Winter	100	+30%	30/15 Summer				44.113	0.315	0.000
1.014	25	30 Winter	100	+30%					43.556	-0.211	0.000
1.015	26	30 Winter	100	+30%					42.252	-0.198	0.000
6.000	27	15 Winter	100	+30%					43.424	-0.131	0.000
6.001	28	15 Winter	100	+30%	30/15 Summer				42.799	0.474	0.000
6.002	29	15 Winter	100	+30%	100/15 Summer				42.347	0.099	0.000
6.003	30	15 Winter	100	+30%					41.973	-0.123	0.000
6.004	31	30 Winter	100	+30%	30/15 Summer				41.554	0.800	0.000
1.016	32	30 Winter	100	+30%	30/15 Summer				41.447	1.477	0.000
1.017	33	600 Winter	100	+30%	1/60 Summer				40.431	1.106	0.000
1.018	34	600 Winter	100	+30%					38.596	-0.154	0.000
1.019	35	600 Winter	100	+30%					37.669	-0.131	0.000
1.020	36	600 Winter	100	+30%					37.322	-0.164	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Level Exceeded
				Time (mins)	Flow (l/s)	
1.012	23	2.45			334.2	SURCHARGED
1.013	24	3.34			340.1	SURCHARGED
1.014	25	0.55			355.1	OK
1.015	26	0.60			371.2	OK
6.000	27	0.36			35.9	OK
6.001	28	2.37			81.4	SURCHARGED
6.002	29	1.30			98.9	SURCHARGED
6.003	30	0.64			127.3	OK
6.004	31	1.73			102.2	SURCHARGED
1.016	32	2.11			452.7	SURCHARGED
1.017	33	0.15			14.2	SURCHARGED
1.018	34	0.22			14.2	OK
1.019	35	0.37			14.2	OK
1.020	36	0.17			14.2	OK