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Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
Date 02/03/2023	Designed by PW	
File 7843 - SW01 REV H.MDX	Checked by	
Micro Drainage	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for 7843 SW01 REV H.SWS

Pipe Sizes 7843 - SW 6A Manhole Sizes 7843 - SW 6A

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.268	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	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)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

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Manhole Schedules for 7843 SW01 REV H.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	90.532	1.500	Open Manhole	1500	1.000	89.032	300				
2	90.671	1.776	Open Manhole	1500	1.001	88.895	300	1.000	88.895	300	
3	91.506	1.725	Open Manhole	1350	2.000	89.781	225				
4	90.523	1.789	Open Manhole	1500	1.002	88.734	300	1.001	88.734	300	
								2.000	88.809	225	
5	90.265	1.785	Open Manhole	1500	1.003	88.480	300	1.002	88.480	300	
6	90.838	1.425	Open Manhole	1350	3.000	89.413	225				
7	91.193	1.425	Open Manhole	1350	4.000	89.768	225				
8	90.422	1.425	Open Manhole	1350	3.001	88.997	225	3.000	88.997	225	
								4.000	88.997	225	
9	89.414	1.770	Open Manhole	1500	3.002	87.644	375	3.001	87.794	225	
10	89.673	2.073	Open Manhole	1500	3.003	87.600	375	3.002	87.600	375	
11	89.870	2.304	Open Manhole	1500	3.004	87.566	375	3.003	87.566	375	
12	90.060	2.546	Open Manhole	1500	3.005	87.514	375	3.004	87.514	375	
13	89.957	2.492	Open Manhole	1500	1.004	87.465	375	1.003	87.540	300	
								3.005	87.465	375	
14	89.424	2.095	Open Manhole	1500	1.005	87.329	375	1.004	87.329	375	
15	89.042	1.742	Open Manhole	1500	5.000	87.300	300				
16	89.136	2.168	Open Manhole	1500	5.001	86.968	300	5.000	86.968	300	
17	88.561	2.048	Open Manhole	1500	1.006	86.513	375	1.005	86.513	375	
								5.001	86.588	300	
18	87.846	1.828	Open Manhole	1500	1.007	86.018	375	1.006	86.018	375	
19	86.723	1.803	Open Manhole	1500	1.008	84.920	450	1.007	84.995	375	
20	86.066	1.425	Open Manhole	1350	6.000	84.641	225				
21	86.481	2.639	Open Manhole	1500	1.009	83.842	450	1.008	83.842	450	
								6.000	84.067	225	
22	84.656	3.351	Open Manhole	1500	1.010	81.305	450	1.009	82.653	450	1348
23	81.843	2.826	Open Manhole	1500	1.011	79.017	450	1.010	80.208	450	1191
24	80.793	1.801	Open Manhole	1500	1.012	78.992	450	1.011	78.992	450	
25	80.000	1.080	Open Manhole	1500	1.013	78.920	500	1.012	78.970	450	
26	78.020	1.454	Junction		1.014	76.566	500	1.013	77.766	500	1200
27	75.340	1.128	Junction		1.015	74.212	500	1.014	75.412	500	1200
28	72.682	0.824	Junction		1.016	71.858	500	1.015	73.058	500	1200
29	70.489	0.985	Junction		1.017	69.504	500	1.016	70.704	500	1200
30	68.142	0.992	Junction		1.018	67.150	500	1.017	68.350	500	1200
31	65.644	2.744	Open Manhole	2100	1.019	62.900	675	1.018	64.468	500	1393
32	64.300	1.424	Open Manhole	2100	1.020	62.876	675	1.019	62.876	675	
33	65.693	2.976	Open Manhole	2100	1.021	62.717	225	1.020	62.717	675	
34	65.416	2.928	Open Manhole	1500	1.022	62.488	225	1.021	62.488	225	
35	60.673	1.400	Open Manhole	1500		OUTFALL		1.022	59.273	225	

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Manhole Schedules for 7843 SW01 REV H.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	297271.239	515807.692	297271.239	515807.692	Required	
2	297303.158	515815.820	297303.158	515815.820	Required	
3	297320.218	515847.223	297320.218	515847.223	Required	
4	297323.728	515814.721	297323.728	515814.721	Required	
5	297345.714	515805.492	297345.714	515805.492	Required	
6	297377.675	515873.956	297377.675	515873.956	Required	
7	297358.986	515863.471	297358.986	515863.471	Required	
8	297379.256	515865.807	297379.256	515865.807	Required	
9	297389.377	515832.013	297389.377	515832.013	Required	
10	297389.286	515818.752	297389.286	515818.752	Required	
11	297385.599	515809.379	297385.599	515809.379	Required	
12	297374.503	515798.220	297374.503	515798.220	Required	
13	297361.708	515791.270	297361.708	515791.270	Required	
14	297368.994	515779.781	297368.994	515779.781	Required	
15	297291.771	515739.940	297291.771	515739.940	Required	
16	297346.127	515755.127	297346.127	515755.127	Required	
17	297375.023	515763.227	297375.023	515763.227	Required	
18	297381.333	515750.337	297381.333	515750.337	Required	

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Manhole Schedules for 7843 SW01 REV H.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
19	297395.331	515727.539	297395.331	515727.539	Required	
20	297337.134	515682.968	297337.134	515682.968	Required	
21	297363.643	515703.082	297363.643	515703.082	Required	
22	297383.186	515678.266	297383.186	515678.266	Required	
23	297404.892	515659.699	297404.892	515659.699	Required	
24	297410.603	515651.337	297410.603	515651.337	Required	
25	297412.667	515642.652	297412.667	515642.652	Required	
26	297422.460	515631.289			No Entry	
27	297432.252	515619.927			No Entry	
28	297442.044	515608.564			No Entry	
29	297451.837	515597.201			No Entry	
30	297461.629	515585.838			No Entry	
31	297477.369	515577.616	297477.369	515577.616	Required	
32	297484.098	515573.992	297484.098	515573.992	Required	
33	297482.096	515510.421	297482.096	515510.421	Required	
34	297484.569	515497.360	297484.569	515497.360	Required	
35	297526.032	515472.098			No Entry	

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PIPELINE SCHEDULES for 7843 SW01 REV H.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	300	1	90.532	89.032	1.200	Open Manhole	1500
1.001	o	300	2	90.671	88.895	1.476	Open Manhole	1500
2.000	o	225	3	91.506	89.781	1.500	Open Manhole	1350
1.002	o	300	4	90.523	88.734	1.489	Open Manhole	1500
1.003	o	300	5	90.265	88.480	1.485	Open Manhole	1500
3.000	o	225	6	90.838	89.413	1.200	Open Manhole	1350
4.000	o	225	7	91.193	89.768	1.200	Open Manhole	1350
3.001	o	225	8	90.422	88.997	1.200	Open Manhole	1350
3.002	o	375	9	89.414	87.644	1.395	Open Manhole	1500
3.003	o	375	10	89.673	87.600	1.698	Open Manhole	1500
3.004	o	375	11	89.870	87.566	1.929	Open Manhole	1500
3.005	o	375	12	90.060	87.514	2.171	Open Manhole	1500
1.004	o	375	13	89.957	87.465	2.117	Open Manhole	1500
1.005	o	375	14	89.424	87.329	1.720	Open Manhole	1500
5.000	o	300	15	89.042	87.300	1.442	Open Manhole	1500
5.001	o	300	16	89.136	86.968	1.868	Open Manhole	1500
1.006	o	375	17	88.561	86.513	1.673	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	32.937	240.4	2	90.671	88.895	1.476	Open Manhole	1500
1.001	20.600	128.0	4	90.523	88.734	1.489	Open Manhole	1500
2.000	32.691	33.6	4	90.523	88.809	1.489	Open Manhole	1500
1.002	23.844	93.9	5	90.265	88.480	1.485	Open Manhole	1500
1.003	21.403	22.8	13	89.957	87.540	2.117	Open Manhole	1500
3.000	8.301	20.0	8	90.422	88.997	1.200	Open Manhole	1350
4.000	20.404	26.5	8	90.422	88.997	1.200	Open Manhole	1350
3.001	35.277	29.3	9	89.414	87.794	1.395	Open Manhole	1500
3.002	13.261	301.4	10	89.673	87.600	1.698	Open Manhole	1500
3.003	10.073	300.0	11	89.870	87.566	1.929	Open Manhole	1500
3.004	15.737	300.0	12	90.060	87.514	2.171	Open Manhole	1500
3.005	14.560	300.0	13	89.957	87.465	2.117	Open Manhole	1500
1.004	13.604	100.0	14	89.424	87.329	1.720	Open Manhole	1500
1.005	17.618	21.6	17	88.561	86.513	1.673	Open Manhole	1500
5.000	56.438	170.0	16	89.136	86.968	1.868	Open Manhole	1500
5.001	30.010	79.0	17	88.561	86.588	1.673	Open Manhole	1500
1.006	14.351	29.0	18	87.846	86.018	1.453	Open Manhole	1500

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PIPELINE SCHEDULES for 7843 SW01 REV H.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)
1.007	o	375	18	87.846	86.018	1.453	Open Manhole	1500
1.008	o	450	19	86.723	84.920	1.353	Open Manhole	1500
6.000	o	225	20	86.066	84.641	1.200	Open Manhole	1350
1.009	o	450	21	86.481	83.842	2.189	Open Manhole	1500
1.010	o	450	22	84.656	81.305	2.901	Open Manhole	1500
1.011	o	450	23	81.843	79.017	2.376	Open Manhole	1500
1.012	o	450	24	80.793	78.992	1.351	Open Manhole	1500
1.013	3 \=/	500	25	80.000	78.920	0.580	Open Manhole	1500
1.014	3 \=/	500	26	78.020	76.566	0.954	Junction	
1.015	3 \=/	500	27	75.340	74.212	0.628	Junction	
1.016	3 \=/	500	28	72.682	71.858	0.324	Junction	
1.017	3 \=/	500	29	70.489	69.504	0.485	Junction	
1.018	3 \=/	500	30	68.142	67.150	0.492	Junction	
1.019	o	675	31	65.644	62.900	2.069	Open Manhole	2100
1.020	o	675	32	64.300	62.876	0.749	Open Manhole	2100
1.021	o	225	33	65.693	62.717	2.751	Open Manhole	2100
1.022	o	225	34	65.416	62.488	2.703	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)
1.007	26.753	26.2	19	86.723	84.995	1.353	Open Manhole	1500
1.008	40.029	37.1	21	86.481	83.842	2.189	Open Manhole	1500
6.000	33.276	58.0	21	86.481	84.067	2.189	Open Manhole	1500
1.009	31.587	26.6	22	84.656	82.653	1.553	Open Manhole	1500
1.010	28.563	26.0	23	81.843	80.208	1.185	Open Manhole	1500
1.011	10.127	405.1	24	80.793	78.992	1.351	Open Manhole	1500
1.012	8.927	400.0	25	80.000	78.970	0.580	Open Manhole	1500
1.013	15.001	13.0	26	78.020	77.766	-0.246	Junction	
1.014	14.999	13.0	27	75.340	75.412	-0.572	Junction	
1.015	15.000	13.0	28	72.682	73.058	-0.876	Junction	
1.016	15.001	13.0	29	70.489	70.704	-0.715	Junction	
1.017	15.000	13.0	30	68.142	68.350	-0.708	Junction	
1.018	17.758	6.6	31	65.644	64.468	0.676	Open Manhole	2100
1.019	7.643	318.5	32	64.300	62.876	0.749	Open Manhole	2100
1.020	63.603	400.0	33	65.693	62.717	2.301	Open Manhole	2100
1.021	13.293	58.0	34	65.416	62.488	2.703	Open Manhole	1500
1.022	48.553	15.1	35	60.673	59.273	1.175	Open Manhole	1500

Free Flowing Outfall Details for 7843 SW01 REV H.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.022	35	60.673	59.273	0.000	1500	0

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Online Controls for 7843 SW01 REV H.SWS

Hydro-Brake® Optimum Manhole: 33, DS/PN: 1.021, Volume (m³): 32.3

Unit Reference	MD-SHE-0207-2370-1500-2370
Design Head (m)	1.500
Design Flow (l/s)	23.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	207
Invert Level (m)	62.717
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points			Control Points		
	Head (m)	Flow (l/s)		Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	23.7	Kick-Flo®	0.994	19.5
Flush-Flo™	0.452	23.7	Mean Flow over Head Range	-	20.4

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	7.1	0.800	22.4	2.000	27.2	4.000	37.9	7.000	49.7
0.200	19.9	1.000	19.5	2.200	28.5	4.500	40.2	7.500	51.4
0.300	23.0	1.200	21.3	2.400	29.7	5.000	42.3	8.000	53.1
0.400	23.6	1.400	22.9	2.600	30.8	5.500	44.3	8.500	54.6
0.500	23.7	1.600	24.4	3.000	33.0	6.000	46.2	9.000	56.2
0.600	23.4	1.800	25.9	3.500	35.6	6.500	48.0	9.500	57.7

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Storage Structures for 7843 SW01 REV H.SWS

Tank or Pond Manhole: 33, DS/PN: 1.021

Invert Level (m) 62.717

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1200.0	0.400	1351.9	0.800	1512.8	1.200	1682.8
0.100	1237.1	0.500	1391.3	0.900	1554.5	1.300	1726.7
0.200	1274.8	0.600	1431.2	1.000	1596.7	1.400	1771.2
0.300	1313.1	0.700	1471.7	1.100	1639.4	1.500	1816.2

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	2.651	2.328	0.000	4.979
1.001	2	3.138	1.456	0.000	4.595
2.000	3	2.469	1.300	0.000	3.769
1.002	4	3.161	1.685	0.000	4.847
1.003	5	3.154	1.513	0.000	4.667
3.000	6	2.040	0.330	0.000	2.370
4.000	7	2.040	0.811	0.000	2.851
3.001	8	2.040	1.403	0.000	3.442
3.002	9	3.128	1.465	0.000	4.592
3.003	10	3.663	1.113	0.000	4.776
3.004	11	4.071	1.738	0.000	5.809
3.005	12	4.499	1.608	0.000	6.107
1.004	13	4.404	1.503	0.000	5.906
1.005	14	3.702	1.946	0.000	5.648
5.000	15	3.078	3.989	0.000	7.068
5.001	16	3.831	2.121	0.000	5.952
1.006	17	3.619	1.585	0.000	5.204
1.007	18	3.230	2.955	0.000	6.185
1.008	19	3.186	6.366	0.000	9.553
6.000	20	2.040	1.323	0.000	3.363
1.009	21	4.663	5.024	0.000	9.687
1.010	22	5.922	4.543	0.000	10.464
1.011	23	4.994	1.611	0.000	6.605
1.012	24	3.183	1.420	0.000	4.602
1.013	25	1.909	60.592	0.000	62.501
1.014	26	0.000	106.033	0.000	106.033
1.015	27	0.000	65.717	0.000	65.717
1.016	28	0.000	36.736	0.000	36.736
1.017	29	0.000	51.048	0.000	51.048
1.018	30	0.000	61.233	0.000	61.233
1.019	31	9.504	2.735	0.000	12.239
1.020	32	4.932	22.760	0.000	27.692
1.021	33	10.308	0.529	4926.971	4937.807
1.022	34	5.174	1.931	0.000	7.105
Total		113.734	460.449	4926.971	5501.153

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.268 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS 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, 50

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
	Name	Storm							(m)	(m)
1.000	1 15	Winter	1	+0%	100/15 Summer	100/15 Winter			89.160	-0.172
1.001	2 15	Winter	1	+0%	100/15 Summer				89.009	-0.186
2.000	3 15	Winter	1	+0%	100/15 Summer				89.839	-0.167
1.002	4 15	Winter	1	+0%	30/15 Winter				88.873	-0.161
1.003	5 15	Winter	1	+0%	100/15 Summer				88.582	-0.198
3.000	6 15	Winter	1	+0%	100/15 Summer				89.442	-0.196
4.000	7 15	Winter	1	+0%	100/15 Winter				89.824	-0.169
3.001	8 15	Winter	1	+0%	100/15 Summer				89.066	-0.156
3.002	9 15	Winter	1	+0%	30/15 Summer	100/15 Winter			87.801	-0.218
3.003	10 15	Winter	1	+0%	30/15 Summer				87.772	-0.203
3.004	11 15	Winter	1	+0%	30/15 Summer				87.751	-0.190
3.005	12 15	Winter	1	+0%	30/15 Summer				87.719	-0.170
1.004	13 15	Winter	1	+0%	30/15 Summer				87.691	-0.149
1.005	14 15	Winter	1	+0%	100/15 Summer				87.462	-0.242
5.000	15 15	Winter	1	+0%	100/15 Summer				87.379	-0.221
5.001	16 15	Winter	1	+0%	100/15 Summer				87.056	-0.212
1.006	17 15	Winter	1	+0%	30/15 Summer				86.688	-0.200
1.007	18 15	Winter	1	+0%	100/15 Summer				86.175	-0.218
1.008	19 15	Winter	1	+0%					85.085	-0.285
6.000	20 15	Winter	1	+0%					84.706	-0.160
1.009	21 15	Winter	1	+0%					84.005	-0.287
1.010	22 15	Winter	1	+0%	100/15 Summer				81.471	-0.284
1.011	23 15	Winter	1	+0%	1/15 Summer				79.505	0.038
1.012	24 15	Winter	1	+0%	1/15 Summer				79.450	0.008
1.013	25 15	Winter	1	+0%					79.057	-0.943
1.014	26 15	Winter	1	+0%					76.707	-1.313
1.015	27 15	Winter	1	+0%					74.348	-0.992
1.016	28 15	Winter	1	+0%					71.995	-0.687
1.017	29 15	Winter	1	+0%					69.639	-0.850
1.018	30 15	Winter	1	+0%					67.265	-0.877

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Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.000	1	0.000	0.37			24.0	OK	1
1.001	2	0.000	0.30			26.1	OK	
2.000	3	0.000	0.15			12.7	OK	
1.002	4	0.000	0.43			44.3	OK	
1.003	5	0.000	0.25			51.3	OK	
3.000	6	0.000	0.04			3.6	OK	
4.000	7	0.000	0.14			12.6	OK	
3.001	8	0.000	0.20			18.1	OK	
3.002	9	0.000	0.31			27.8	OK	1
3.003	10	0.000	0.34			29.1	OK	
3.004	11	0.000	0.38			35.0	OK	
3.005	12	0.000	0.44			40.2	OK	
1.004	13	0.000	0.67			97.0	OK	
1.005	14	0.000	0.27			96.7	OK	
5.000	15	0.000	0.15			12.2	OK	
5.001	16	0.000	0.19			21.5	OK	
1.006	17	0.000	0.45			122.6	OK	
1.007	18	0.000	0.37			125.4	OK	
1.008	19	0.000	0.29			136.5	OK	
6.000	20	0.000	0.18			11.5	OK	
1.009	21	0.000	0.28			153.7	OK	
1.010	22	0.000	0.29			158.4	OK	
1.011	23	0.000	1.70			163.2	SURCHARGED	
1.012	24	0.000	1.76			165.9	SURCHARGED	
1.013	25	0.000	0.01			166.2	OK	
1.014	26	0.000	0.01			166.2	OK	
1.015	27	0.000	0.01			165.9	OK	
1.016	28	0.000	0.02			165.3	OK	
1.017	29	0.000	0.01			164.8	OK	
1.018	30	0.000	0.01			165.4	OK	

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Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.SWS

									Water	Surcharged	Flooded	
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.		(m)	(m)	(m³)
1.019	31	15 Winter	1	+0%	100/15 Summer					63.276	-0.299	0.000
1.020	32	15 Winter	1	+0%	100/15 Summer					63.172	-0.379	0.000
1.021	33	600 Winter	1	+0%	30/30 Winter					62.894	-0.048	0.000
1.022	34	600 Winter	1	+0%						62.543	-0.170	0.000

US/MH		Flow / Overflow		Half Drain	Pipe	Level	
PN	Name	Cap.	(l/s)	Time (mins)	Flow (l/s)	Status	Exceeded
1.019	31	0.59			166.0	OK	
1.020	32	0.40			165.9	OK	
1.021	33	0.29			17.3	OK	
1.022	34	0.13			17.3	OK	

Coopers		Page 11
Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.268 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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, 50

PN	US/MH		Return Period	Climate Change	First (X)		First (Y)		First (Z)		Water Level	Surcharged Depth
	Name	Storm			Surcharge	Flood	Overflow	Act.	Overflow	Act.	(m)	(m)
1.000	1 15	Winter	30	+0%	100/15 Summer	100/15 Winter					89.256	-0.076
1.001	2 15	Winter	30	+0%	100/15 Summer						89.121	-0.074
2.000	3 15	Winter	30	+0%	100/15 Summer						89.875	-0.131
1.002	4 15	Winter	30	+0%	30/15 Winter						89.038	0.004
1.003	5 15	Summer	30	+0%	100/15 Summer						88.649	-0.131
3.000	6 15	Winter	30	+0%	100/15 Summer						89.460	-0.178
4.000	7 15	Winter	30	+0%	100/15 Winter						89.858	-0.135
3.001	8 15	Winter	30	+0%	100/15 Summer						89.110	-0.112
3.002	9 15	Winter	30	+0%	30/15 Summer	100/15 Winter					88.229	0.210
3.003	10 15	Winter	30	+0%	30/15 Summer						88.197	0.222
3.004	11 15	Winter	30	+0%	30/15 Summer						88.169	0.228
3.005	12 15	Winter	30	+0%	30/15 Summer						88.121	0.232
1.004	13 15	Winter	30	+0%	30/15 Summer						88.060	0.220
1.005	14 15	Winter	30	+0%	100/15 Summer						87.554	-0.150
5.000	15 15	Winter	30	+0%	100/15 Summer						87.428	-0.172
5.001	16 15	Winter	30	+0%	100/15 Summer						87.120	-0.148
1.006	17 15	Winter	30	+0%	30/15 Summer						86.956	0.068
1.007	18 15	Winter	30	+0%	100/15 Summer						86.294	-0.099
1.008	19 15	Winter	30	+0%							85.200	-0.170
6.000	20 15	Winter	30	+0%							84.746	-0.120
1.009	21 15	Winter	30	+0%							84.118	-0.174
1.010	22 15	Winter	30	+0%	100/15 Summer						81.587	-0.168
1.011	23 15	Winter	30	+0%	1/15 Summer						80.417	0.950
1.012	24 15	Winter	30	+0%	1/15 Summer						79.915	0.473
1.013	25 15	Winter	30	+0%							79.140	-0.860
1.014	26 15	Winter	30	+0%							76.772	-1.248
1.015	27 15	Winter	30	+0%							74.427	-0.913
1.016	28 15	Winter	30	+0%							72.072	-0.610
1.017	29 15	Winter	30	+0%							69.719	-0.770
1.018	30 15	Winter	30	+0%							67.332	-0.810

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)			
1.000	1	0.000	0.88			57.8	OK	1
1.001	2	0.000	0.72			62.2	OK	
2.000	3	0.000	0.36			30.7	OK	
1.002	4	0.000	1.02			103.5	SURCHARGED	
1.003	5	0.000	0.59			121.6	OK	
3.000	6	0.000	0.10			8.7	OK	
4.000	7	0.000	0.33			30.4	OK	
3.001	8	0.000	0.49			45.0	OK	
3.002	9	0.000	0.76			68.2	SURCHARGED	1
3.003	10	0.000	0.85			71.9	SURCHARGED	
3.004	11	0.000	0.94			87.0	SURCHARGED	
3.005	12	0.000	1.10			100.4	SURCHARGED	
1.004	13	0.000	1.63			235.1	SURCHARGED	
1.005	14	0.000	0.67			236.3	OK	
5.000	15	0.000	0.36			29.3	OK	
5.001	16	0.000	0.49			55.9	OK	
1.006	17	0.000	1.08			298.5	SURCHARGED	
1.007	18	0.000	0.89			304.4	OK	
1.008	19	0.000	0.70			329.2	OK	
6.000	20	0.000	0.43			27.8	OK	
1.009	21	0.000	0.68			370.3	OK	
1.010	22	0.000	0.71			382.8	OK	
1.011	23	0.000	4.13			396.6	SURCHARGED	
1.012	24	0.000	4.28			402.6	SURCHARGED	
1.013	25	0.000	0.03			402.5	OK	
1.014	26	0.000	0.01			401.5	OK	
1.015	27	0.000	0.02			399.5	OK	
1.016	28	0.000	0.05			400.2	OK	
1.017	29	0.000	0.03			401.2	OK	
1.018	30	0.000	0.02			401.7	OK	

Coopers		Page 13
Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01 REV H.SWS

									Water	Surcharged	Flooded	
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume
PN	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)
1.019	31	30 Summer	30	+0%	100/15 Summer					63.575	0.000	0.000
1.020	32	15 Winter	30	+0%	100/15 Summer					63.404	-0.147	0.000
1.021	33	360 Winter	30	+0%	30/30 Winter					63.115	0.173	0.000
1.022	34	360 Winter	30	+0%						62.553	-0.160	0.000

US/MH		Half Drain		Pipe	Level	
PN	Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status
1.019	31	1.38			383.8	OK
1.020	32	0.97			400.0	OK
1.021	33	0.40			23.6	SURCHARGED
1.022	34	0.18			23.6	OK

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Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.268 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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, 50

US/MH		Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
PN	Name								(m)	(m)
1.000	1 15 Winter	100	+50%	100/15 Summer	100/15 Winter				90.532	1.200
1.001	2 15 Winter	100	+50%	100/15 Summer					90.391	1.196
2.000	3 15 Winter	100	+50%	100/15 Summer					90.469	0.463
1.002	4 15 Winter	100	+50%	30/15 Winter					90.249	1.215
1.003	5 15 Winter	100	+50%	100/15 Summer					89.771	0.991
3.000	6 15 Winter	100	+50%	100/15 Summer					89.959	0.321
4.000	7 15 Winter	100	+50%	100/15 Winter					90.112	0.119
3.001	8 15 Winter	100	+50%	100/15 Summer					89.945	0.723
3.002	9 15 Winter	100	+50%	30/15 Summer	100/15 Winter				89.415	1.396
3.003	10 15 Winter	100	+50%	30/15 Summer					89.380	1.405
3.004	11 15 Winter	100	+50%	30/15 Summer					89.349	1.408
3.005	12 15 Winter	100	+50%	30/15 Summer					89.285	1.396
1.004	13 15 Winter	100	+50%	30/15 Summer					89.180	1.340
1.005	14 15 Winter	100	+50%	100/15 Summer					88.545	0.841
5.000	15 15 Winter	100	+50%	100/15 Summer					88.166	0.566
5.001	16 15 Winter	100	+50%	100/15 Summer					88.074	0.806
1.006	17 15 Winter	100	+50%	30/15 Summer					87.914	1.026
1.007	18 15 Winter	100	+50%	100/15 Summer					86.853	0.460
1.008	19 15 Winter	100	+50%						85.285	-0.085
6.000	20 15 Winter	100	+50%						84.801	-0.065
1.009	21 15 Winter	100	+50%						84.240	-0.052
1.010	22 15 Winter	100	+50%	100/15 Summer					82.808	1.053
1.011	23 15 Winter	100	+50%	1/15 Summer					81.610	2.143
1.012	24 15 Winter	100	+50%	1/15 Summer					80.521	1.079
1.013	25 15 Winter	100	+50%						79.180	-0.820
1.014	26 15 Winter	100	+50%						76.820	-1.200
1.015	27 15 Winter	100	+50%						74.468	-0.872
1.016	28 15 Winter	100	+50%						72.117	-0.565
1.017	29 15 Winter	100	+50%						69.761	-0.728
1.018	30 15 Winter	100	+50%						67.370	-0.772

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Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.000	1	0.499	1.16			76.1	FLOOD	1
1.001	2	0.000	0.98			84.5	FLOOD RISK	
2.000	3	0.000	0.64			54.0	SURCHARGED	
1.002	4	0.000	1.38			140.8	FLOOD RISK	
1.003	5	0.000	0.80			163.3	SURCHARGED	
3.000	6	0.000	0.17			15.4	SURCHARGED	
4.000	7	0.000	0.63			57.7	SURCHARGED	
3.001	8	0.000	0.73			66.6	SURCHARGED	
3.002	9	1.088	1.11			99.3	FLOOD	1
3.003	10	0.000	1.19			101.2	FLOOD RISK	
3.004	11	0.000	1.33			123.4	SURCHARGED	
3.005	12	0.000	1.57			143.2	SURCHARGED	
1.004	13	0.000	2.16			311.4	SURCHARGED	
1.005	14	0.000	0.88			311.7	SURCHARGED	
5.000	15	0.000	0.58			47.0	SURCHARGED	
5.001	16	0.000	0.64			73.2	SURCHARGED	
1.006	17	0.000	1.46			401.2	SURCHARGED	
1.007	18	0.000	1.21			412.5	SURCHARGED	
1.008	19	0.000	0.97			460.7	OK	
6.000	20	0.000	0.83			53.2	OK	
1.009	21	0.000	1.00			544.2	OK	
1.010	22	0.000	1.04			566.5	SURCHARGED	
1.011	23	0.000	6.12			587.5	FLOOD RISK	
1.012	24	0.000	6.34			596.3	FLOOD RISK	
1.013	25	0.000	0.04			595.1	OK	
1.014	26	0.000	0.02			595.6	OK	
1.015	27	0.000	0.04			596.2	OK	
1.016	28	0.000	0.07			596.5	OK	
1.017	29	0.000	0.05			596.5	OK	
1.018	30	0.000	0.03			596.0	OK	

Coopers		Page 16
Park House Sandpiper Court Chester CH4 9QU	Edge Hill Phase 4	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 SW01
REV H.SWS

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
1.019	31	15 Winter	100	+50%	100/15 Summer				63.911	0.336	0.000	
1.020	32	15 Winter	100	+50%	100/15 Summer				63.690	0.139	0.000	
1.021	33	480 Winter	100	+50%	30/30 Winter				63.604	0.662	0.000	
1.022	34	360 Winter	100	+50%					62.553	-0.160	0.000	

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded		
1.019	31	2.13			593.8	SURCHARGED			
1.020	32	1.42			586.9	SURCHARGED			
1.021	33	0.40			23.6	SURCHARGED			
1.022	34	0.18			23.6	OK			