STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for 7843 - SW 7 REV J REVISED SWALE.SWS

Pipe Sizes 7843 SW01 REV H Manhole Sizes 7843 SW01 REV H

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

Network Design Table for 7843 - SW 7 REV J REVISED SWALE.SWS

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	32.937	0.137	240.4	0.243	5.00	0.0	0.600		o	300	Pipe/Conduit	
1.001	20.600	0.161	128.0	0.032	0.00	0.0	0.600		o	300	Pipe/Conduit	
2.000	32.691	0.972	33.6	0.131	5.00	0.0	0.600		o	225	Pipe/Conduit	
1.002	23.844	0.254	93.9	0.074	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.003	21.403	0.940	22.8	0.088	0.00	0.0	0.600		o	300	Pipe/Conduit	
3.000	8.301	0.416	20.0	0.037	5.00	0.0	0.600		o	225	Pipe/Conduit	
4.000	20.404	0.771	26.5	0.130	5.00	0.0	0.600		o	225	Pipe/Conduit	
3.001	35.277	1.203	29.3	0.025	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)
1.000	50.00	5.54	89.032	0.243	0.0	0.0	0.0	1.01	71.4	32.9
1.001	50.00	5.79	88.895	0.275	0.0	0.0	0.0	1.39	98.1	37.2
2.000	50.00	5.24	89.781	0.131	0.0	0.0	0.0	2.26	90.0	17.7
1.002	50.00	6.04	88.734	0.480	0.0	0.0	0.0	1.62	114.7	65.0
1.003	50.00	6.14	88.480	0.568	0.0	0.0	0.0	3.31	233.9	76.9
3.000	50.00	5.05	89.413	0.037	0.0	0.0	0.0	2.94	117.0	5.0
4.000	50.00	5.13	89.768	0.130	0.0	0.0	0.0	2.55	101.5	17.6
3.001	50.00	5.38	88.997	0.192	0.0	0.0	0.0	2.43	96.4	26.0

Network Design Table for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
3.002	13.261	0.044	301.4	0.119	0.00	0.0	0.600		o	375	Pipe/Conduit	
3.003	10.073	0.034	299.8	0.022	0.00	0.0	0.600		o	375	Pipe/Conduit	
3.004	15.737	0.053	299.7	0.083	0.00	0.0	0.600		o	375	Pipe/Conduit	
3.005	14.560	0.049	297.1	0.070	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.004	13.604	0.136	100.0	0.068	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.005	17.618	0.816	21.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
5.000	56.437	0.332	170.0	0.129	5.00	0.0	0.600		o	300	Pipe/Conduit	
5.001	30.010	0.380	79.0	0.116	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.006	14.351	0.495	29.0	0.066	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.007	26.753	1.274	21.0	0.039	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.008	40.028	0.827	48.4	0.160	0.00	0.0	0.600		o	450	Pipe/Conduit	
6.000	33.276	0.574	58.0	0.120	5.00	0.0	0.600		o	225	Pipe/Conduit	
1.009	31.148	1.189	26.2	0.103	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.010	28.948	1.097	26.4	0.073	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.011	11.448	0.029	400.0	0.070	0.00	0.0	0.600		o	600	Pipe/Conduit	
1.012	8.271	0.021	400.0	0.031	0.00	0.0	0.600		o	600	Pipe/Conduit	
1.013	8.289	0.488	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.014	9.014	0.530	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.015	9.657	0.568	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	

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)
3.002	50.00	5.59	87.644	0.311	0.0	0.0	0.0	1.04	114.7	42.1
3.003	50.00	5.75	87.600	0.333	0.0	0.0	0.0	1.04	115.0	45.1
3.004	50.00	6.00	87.566	0.416	0.0	0.0	0.0	1.04	115.0	56.3
3.005	50.00	6.23	87.514	0.486	0.0	0.0	0.0	1.05	115.5	65.8
1.004	50.00	6.36	87.465	1.122	0.0	0.0	0.0	1.81	200.1	151.9
1.005	50.00	6.43	87.329	1.122	0.0	0.0	0.0	3.91	432.3	151.9
5.000	50.00	5.78	87.300	0.129	0.0	0.0	0.0	1.20	85.0	17.5
5.001	50.00	6.06	86.968	0.245	0.0	0.0	0.0	1.77	125.2	33.2
1.006	50.00	6.50	86.513	1.433	0.0	0.0	0.0	3.38	372.9	194.0
1.007	50.00	6.62	86.018	1.472	0.0	0.0	0.0	3.97	438.4	199.3
1.008	50.00	6.84	84.669	1.632	0.0	0.0	0.0	2.93	465.7	221.0
6.000	50.00	5.32	84.641	0.120	0.0	0.0	0.0	1.72	68.4	16.2
1.009	50.00	6.98	83.842	1.855	0.0	0.0	0.0	3.98	633.7	251.2
1.010	50.00	7.10	81.305	1.928	0.0	0.0	0.0	3.97	631.4	261.1
1.011	50.00	7.25	79.017	1.998	0.0	0.0	0.0	1.21	342.5	270.6
1.012	50.00	7.37	78.988	2.029	0.0	0.0	0.0	1.21	342.5	274.8
1.013	50.00	7.41	78.968	2.029	0.0	0.0	0.0	2.93	3813.4	274.8
1.014	50.00	7.47	77.359	2.029	0.0	0.0	0.0	2.93	3810.9	274.8
1.015	50.00	7.52	75.682	2.029	0.0	0.0	0.0	2.93	3811.6	274.8

Network Design Table for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.016	8.985	0.529	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.017	9.990	0.588	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.018	13.767	0.810	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.019	12.724	0.748	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.020	2.575	0.151	17.1	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.021	7.185	0.423	17.0	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.022	18.216	1.687	10.8	0.000	0.00	0.0		0.035	4 \=/	600	1:4 Swale	
1.023	63.603	0.318	200.0	0.000	0.00	0.0		0.035	3 \=/	16000	1:3 Swale	
1.024	25.203	0.518	48.7	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.025	41.523	2.966	14.0	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)
1.016	50.00	7.57	74.005	2.029	0.0	0.0	0.0	2.93	3813.5	274.8
1.017	50.00	7.63	72.287	2.029	0.0	0.0	0.0	2.93	3812.9	274.8
1.018	50.00	7.71	70.298	2.029	0.0	0.0	0.0	2.93	3812.2	274.8
1.019	50.00	7.78	68.341	2.029	0.0	0.0	0.0	2.93	3810.6	274.8
1.020	50.00	7.79	66.599	2.029	0.0	0.0	0.0	2.93	3805.8	274.8
1.021	50.00	7.84	66.448	2.029	0.0	0.0	0.0	2.93	3813.4	274.8
1.022	50.00	7.92	65.021	2.029	0.0	0.0	0.0	3.68	4782.8	274.8
1.023	50.00	8.80	63.035	2.029	0.0	0.0	0.0	1.20	10482.2	274.8
1.024	50.00	9.03	62.717	2.029	0.0	0.0	0.0	1.88	74.7«	274.8
1.025	50.00	9.22	62.282	2.029	0.0	0.0	0.0	3.52	139.8«	274.8

Manhole Schedules for 7843 - SW 7 REV J REVISED SWALE.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	90.549	1.517	Open Manhole	1800	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	1500	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	1500	3.000	89.413	225				
7	91.260	1.492	Open Manhole	1800	4.000	89.768	225				
8	90.422	1.425	Open Manhole	1500	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	90.135	2.621	Open Manhole	1350	3.005	87.514	375	3.004	87.514	375	
13	90.032	2.567	Open Manhole	1500	1.004	87.465	375	1.003	87.540	300	
								3.005	87.465	375	
14	89.499	2.170	Open Manhole	1350	1.005	87.329	375	1.004	87.329	375	
15	89.042	1.742	Open Manhole	1800	5.000	87.300	300				
16	89.108	2.140	Open Manhole	1500	5.001	86.968	300	5.000	86.968	300	
17	88.561	2.048	Open Manhole	1800	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	86.797	2.128	Open Manhole	1800	1.008	84.669	450	1.007	84.744	375	
20	86.062	1.421	Open Manhole	1800	6.000	84.641	225				
21	86.478	2.636	Open Manhole	1800	1.009	83.842	450	1.008	83.842	450	
								6.000	84.067	225	
22	84.601	3.296	Open Manhole	1800	1.010	81.305	450	1.009	82.653	450	1348
23	81.843	2.826	Open Manhole	1500	1.011	79.017	600	1.010	80.208	450	1041
24	80.793	1.805	Open Manhole	1500	1.012	78.988	600	1.011	78.988	600	
25	80.000	1.032	Junction		1.013	78.968	600	1.012	78.968	600	
26	79.255	1.896	Junction		1.014	77.359	600	1.013	78.480	600	1121
27	77.613	1.931	Junction		1.015	75.682	600	1.014	76.829	600	1147
28	75.933	1.928	Junction		1.016	74.005	600	1.015	75.114	600	1109
29	74.260	1.973	Junction		1.017	72.287	600	1.016	73.476	600	1189
30	72.537	2.239	Junction		1.018	70.298	600	1.017	71.699	600	1401
31	70.536	2.195	Junction		1.019	68.341	600	1.018	69.488	600	1147
32	68.577	1.978	Junction		1.020	66.599	600	1.019	67.593	600	994
dummy	68.142	1.694	Junction		1.021	66.448	600	1.020	66.448	600	
33	66.854	1.833	Junction		1.022	65.021	600	1.021	66.025	600	1004
34	65.600	2.565	Junction		1.023	63.035	16000	1.022	63.334	600	299

Manhole Schedules for 7843 - SW 7 REV J REVISED SWALE.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)
35	65.693	2.976	Open Manhole	2100	1.024	62.717	225	1.023	62.717	16000	
36	65.416	3.217	Open Manhole	1500	1.025	62.282	225	1.024	62.199	225	
37	60.673	1.357	Open Manhole	1500		OUTFALL		1.025	59.316	225	

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	

Manhole Schedules for 7843 - SW 7 REV J REVISED SWALE.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
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	
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	297383.116	515678.772	297383.116	515678.772	Required	
23	297405.010	515659.829	297405.010	515659.829	Required	
24	297412.185	515650.909	297412.185	515650.909	Required	
25	297412.667	515642.652			No Entry	
26	297418.078	515636.373			No Entry	
27	297423.963	515629.545			No Entry	
28	297430.267	515622.230			No Entry	
29	297436.133	515615.423			No Entry	
30	297442.654	515607.856			No Entry	

Manhole Schedules for 7843 - SW 7 REV J REVISED SWALE.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
31	297451.642	515597.427			No Entry	
32	297459.948	515587.788			No Entry	
dummy	297461.629	515585.838			No Entry	
33	297467.998	515582.511			No Entry	
34	297484.098	515573.992			No Entry	
35	297482.096	515510.421	297482.096	515510.421	Required	
36	297486.785	515485.658	297486.785	515485.658	Required	
37	297526.032	515472.098			No Entry	

PIPELINE SCHEDULES for 7843 - SW 7 REV J REVISED SWALE.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	90.549	89.032	1.217	Open Manhole	1800
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	1500
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	1500
4.000	o	225	7	91.260	89.768	1.267	Open Manhole	1800
3.001	o	225	8	90.422	88.997	1.200	Open Manhole	1500
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	90.135	87.514	2.246	Open Manhole	1350
1.004	o	375	13	90.032	87.465	2.192	Open Manhole	1500
1.005	o	375	14	89.499	87.329	1.795	Open Manhole	1350
5.000	o	300	15	89.042	87.300	1.442	Open Manhole	1800
5.001	o	300	16	89.108	86.968	1.840	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	90.032	87.540	2.192	Open Manhole	1500
3.000	8.301	20.0	8	90.422	88.997	1.200	Open Manhole	1500
4.000	20.404	26.5	8	90.422	88.997	1.200	Open Manhole	1500
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	299.8	11	89.870	87.566	1.929	Open Manhole	1500
3.004	15.737	299.7	12	90.135	87.514	2.246	Open Manhole	1350
3.005	14.560	297.1	13	90.032	87.465	2.192	Open Manhole	1500
1.004	13.604	100.0	14	89.499	87.329	1.795	Open Manhole	1350
1.005	17.618	21.6	17	88.561	86.513	1.673	Open Manhole	1800
5.000	56.437	170.0	16	89.108	86.968	1.840	Open Manhole	1500
5.001	30.010	79.0	17	88.561	86.588	1.673	Open Manhole	1800

PIPELINE SCHEDULES for 7843 - SW 7 REV J REVISED SWALE.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)
1.006	o	375	17	88.561	86.513	1.673	Open Manhole	1800
1.007	o	375	18	87.846	86.018	1.453	Open Manhole	1500
1.008	o	450	19	86.797	84.669	1.678	Open Manhole	1800
6.000	o	225	20	86.062	84.641	1.196	Open Manhole	1800
1.009	o	450	21	86.478	83.842	2.186	Open Manhole	1800
1.010	o	450	22	84.601	81.305	2.846	Open Manhole	1800
1.011	o	600	23	81.843	79.017	2.226	Open Manhole	1500
1.012	o	600	24	80.793	78.988	1.205	Open Manhole	1500
1.013	4 \=/	600	25	80.000	78.968	0.532	Junction	
1.014	4 \=/	600	26	79.255	77.359	1.396	Junction	
1.015	4 \=/	600	27	77.613	75.682	1.431	Junction	
1.016	4 \=/	600	28	75.933	74.005	1.428	Junction	
1.017	4 \=/	600	29	74.260	72.287	1.473	Junction	
1.018	4 \=/	600	30	72.537	70.298	1.739	Junction	
1.019	4 \=/	600	31	70.536	68.341	1.695	Junction	
1.020	4 \=/	600	32	68.577	66.599	1.478	Junction	
1.021	4 \=/	600	dummy	68.142	66.448	1.194	Junction	
1.022	4 \=/	600	33	66.854	65.021	1.333	Junction	
1.023	3 \=/	16000	34	65.600	63.035	2.065	Junction	
1.024	o	225	35	65.693	62.717	2.751	Open Manhole	2100

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)
1.006	14.351	29.0	18	87.846	86.018	1.453	Open Manhole	1500
1.007	26.753	21.0	19	86.797	84.744	1.678	Open Manhole	1800
1.008	40.028	48.4	21	86.478	83.842	2.186	Open Manhole	1800
6.000	33.276	58.0	21	86.478	84.067	2.186	Open Manhole	1800
1.009	31.148	26.2	22	84.601	82.653	1.498	Open Manhole	1800
1.010	28.948	26.4	23	81.843	80.208	1.185	Open Manhole	1500
1.011	11.448	400.0	24	80.793	78.988	1.205	Open Manhole	1500
1.012	8.271	400.0	25	80.000	78.968	0.432	Junction	
1.013	8.289	17.0	26	79.255	78.480	0.275	Junction	
1.014	9.014	17.0	27	77.613	76.829	0.284	Junction	
1.015	9.657	17.0	28	75.933	75.114	0.319	Junction	
1.016	8.985	17.0	29	74.260	73.476	0.284	Junction	
1.017	9.990	17.0	30	72.537	71.699	0.338	Junction	
1.018	13.767	17.0	31	70.536	69.488	0.548	Junction	
1.019	12.724	17.0	32	68.577	67.593	0.484	Junction	
1.020	2.575	17.1	dummy	68.142	66.448	1.194	Junction	
1.021	7.185	17.0	33	66.854	66.025	0.329	Junction	
1.022	18.216	10.8	34	65.600	63.334	1.766	Junction	
1.023	63.603	200.0	35	65.693	62.717	2.476	Open Manhole	2100
1.024	25.203	48.7	36	65.416	62.199	2.992	Open Manhole	1500

PIPELINE SCHEDULES for 7843 - SW 7 REV J REVISED SWALE.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)
1.025	o	225	36	65.416	62.282	2.909	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)
1.025	41.523	14.0	37	60.673	59.316	1.132	Open Manhole	1500

Network Classifications for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1.000	1	300	1.072	1.476	Unclassified	1800	0	1.217	Unclassified
1.001	2	300	1.476	1.541	Unclassified	1500	0	1.476	Unclassified
2.000	3	225	1.430	1.500	Unclassified	1500	0	1.500	Unclassified
1.002	4	300	1.485	1.513	Unclassified	1500	0	1.489	Unclassified
1.003	5	300	1.485	2.192	Unclassified	1500	0	1.485	Unclassified
3.000	6	225	1.187	1.209	Unclassified	1500	0	1.200	Unclassified
4.000	7	225	1.150	1.267	Unclassified	1800	0	1.267	Unclassified
3.001	8	225	0.975	1.395	Unclassified	1500	0	1.200	Unclassified
3.002	9	375	1.395	1.698	Unclassified	1500	0	1.395	Unclassified
3.003	10	375	1.698	1.929	Unclassified	1500	0	1.698	Unclassified
3.004	11	375	1.929	2.246	Unclassified	1500	0	1.929	Unclassified
3.005	12	375	2.171	2.246	Unclassified	1350	0	2.246	Unclassified
1.004	13	375	1.795	2.192	Unclassified	1500	0	2.192	Unclassified
1.005	14	375	1.673	1.795	Unclassified	1350	0	1.795	Unclassified
5.000	15	300	1.442	1.840	Unclassified	1800	0	1.442	Unclassified
5.001	16	300	1.666	1.840	Unclassified	1500	0	1.840	Unclassified
1.006	17	375	1.453	1.673	Unclassified	1800	0	1.673	Unclassified
1.007	18	375	1.421	1.678	Unclassified	1500	0	1.453	Unclassified
1.008	19	450	1.678	2.186	Unclassified	1800	0	1.678	Unclassified
6.000	20	225	1.196	2.186	Unclassified	1800	0	1.196	Unclassified
1.009	21	450	1.498	2.186	Unclassified	1800	0	2.186	Unclassified
1.010	22	450	1.185	2.846	Unclassified	1800	0	2.846	Unclassified
1.011	23	600	1.205	2.226	Unclassified	1500	0	2.226	Unclassified
1.012	24	600	0.432	1.205	Unclassified	1500	0	1.205	Unclassified
1.013	25	600	0.275	0.532	Unclassified				Junction
1.014	26	600	0.284	1.396	Unclassified				Junction
1.015	27	600	0.319	1.431	Unclassified				Junction
1.016	28	600	0.284	1.428	Unclassified				Junction
1.017	29	600	0.338	1.473	Unclassified				Junction
1.018	30	600	0.548	1.739	Unclassified				Junction
1.019	31	600	0.484	1.695	Unclassified				Junction
1.020	32	600	1.194	1.478	Unclassified				Junction
1.021	dummy	600	0.329	1.194	Unclassified				Junction
1.022	33	600	1.333	1.766	Unclassified				Junction
1.023	34	16000	2.065	2.476	Unclassified				Junction
1.024	35	225	2.751	2.992	Unclassified	2100	0	2.751	Unclassified
1.025	36	225	1.132	2.909	Unclassified	1500	0	2.909	Unclassified

Free Flowing Outfall Details for 7843 - SW 7 REV J REVISED SWALE.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.025	37	60.673	59.316	0.000	1500	0

Simulation Criteria for 7843 - SW 7 REV J REVISED SWALE.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	16.000	Storm Duration (mins)	30
Ratio R	0.268		

Online Controls for 7843 - SW 7 REV J REVISED SWALE.SWS

Hydro-Brake® Optimum Manhole: 35, DS/PN: 1.024, Volume (m³): 3812.1

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	Head (m)	Flow (l/s)	Control Points	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

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.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 Coeffiecient	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 0 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
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)	2, 30, 100, 101
Climate Change (%)	0, 0, 50, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Winter	2	+0%	100/15 Summer				89.177	-0.155	0.000
1.001	2	15 Winter	2	+0%	100/15 Summer				89.024	-0.171	0.000
2.000	3	15 Winter	2	+0%	100/15 Summer				89.849	-0.157	0.000
1.002	4	15 Winter	2	+0%	100/15 Summer				88.894	-0.140	0.000
1.003	5	15 Winter	2	+0%	100/15 Summer				88.596	-0.184	0.000
3.000	6	15 Winter	2	+0%	100/15 Summer				89.446	-0.192	0.000
4.000	7	15 Winter	2	+0%	100/15 Winter				89.832	-0.161	0.000
3.001	8	15 Winter	2	+0%	100/15 Summer				89.075	-0.147	0.000
3.002	9	15 Winter	2	+0%	30/15 Summer	100/15 Winter			87.833	-0.186	0.000
3.003	10	15 Winter	2	+0%	30/15 Summer				87.806	-0.169	0.000
3.004	11	15 Winter	2	+0%	30/15 Summer				87.788	-0.153	0.000
3.005	12	15 Winter	2	+0%	30/15 Summer				87.759	-0.130	0.000
1.004	13	15 Winter	2	+0%	30/15 Summer				87.731	-0.109	0.000
1.005	14	15 Winter	2	+0%	100/15 Summer				87.481	-0.223	0.000
5.000	15	15 Winter	2	+0%	100/15 Summer				87.391	-0.209	0.000
5.001	16	15 Winter	2	+0%	100/15 Summer				87.068	-0.200	0.000
1.006	17	15 Winter	2	+0%	30/15 Winter				86.714	-0.174	0.000
1.007	18	15 Winter	2	+0%	100/15 Summer				86.186	-0.207	0.000
1.008	19	15 Winter	2	+0%	100/15 Summer				84.882	-0.237	0.000
6.000	20	15 Winter	2	+0%					84.715	-0.151	0.000
1.009	21	15 Winter	2	+0%	100/15 Summer				84.044	-0.248	0.000
1.010	22	15 Winter	2	+0%					81.495	-0.260	0.000
1.011	23	15 Winter	2	+0%	2/15 Winter				79.617	0.000	0.000
1.012	24	15 Winter	2	+0%	30/15 Summer				79.588	0.000	0.000
1.013	25	15 Winter	2	+0%					79.095	-0.905	0.000

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.46			30.0	OK	
1.001	2	0.38			32.8	OK	
2.000	3	0.19			16.4	OK	
1.002	4	0.55			55.7	OK	
1.003	5	0.31			64.5	OK	
3.000	6	0.05			4.6	OK	
4.000	7	0.18			16.3	OK	
3.001	8	0.26			23.4	OK	
3.002	9	0.40			35.8	OK	1
3.003	10	0.44			37.3	OK	
3.004	11	0.48			44.7	OK	
3.005	12	0.56			51.4	OK	
1.004	13	0.85			122.6	OK	
1.005	14	0.35			122.2	OK	
5.000	15	0.19			15.7	OK	
5.001	16	0.24			27.8	OK	
1.006	17	0.56			155.0	OK	
1.007	18	0.41			158.0	OK	
1.008	19	0.45			172.1	OK	
6.000	20	0.23			14.9	OK	
1.009	21	0.41			194.3	OK	
1.010	22	0.37			200.2	OK	
1.011	23	1.06			206.8	SURCHARGED	
1.012	24	1.17			205.9	OK	
1.013	25	0.02			204.8	OK	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)
1.014	26	15 Winter	2	+0%					77.491	-1.764	0.000
1.015	27	15 Winter	2	+0%					75.814	-1.799	0.000
1.016	28	15 Winter	2	+0%					74.137	-1.796	0.000
1.017	29	15 Winter	2	+0%					72.418	-1.842	0.000
1.018	30	15 Winter	2	+0%					70.428	-2.109	0.000
1.019	31	15 Winter	2	+0%					68.471	-2.065	0.000
1.020	32	15 Winter	2	+0%					66.730	-1.847	0.000
1.021	dummy	15 Winter	2	+0%					66.580	-1.562	0.000
1.022	33	15 Winter	2	+0%					65.138	-1.716	0.000
1.023	34	180 Winter	2	+0%					63.154	-2.446	0.000
1.024	35	180 Winter	2	+0%	2/15 Summer				63.153	0.211	0.000
1.025	36	480 Winter	2	+0%					62.347	-0.160	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.014	26	0.00			205.7	OK	
1.015	27	0.00			206.3	OK	
1.016	28	0.00			206.5	OK	
1.017	29	0.00			206.4	OK	
1.018	30	0.00			205.8	OK	
1.019	31	0.00			204.9	OK	
1.020	32	0.00			205.1	OK	
1.021	dummy	0.01			205.7	OK	
1.022	33	0.00			206.0	OK	
1.023	34	0.00			77.6	OK	
1.024	35	0.34			23.5	SURCHARGED	
1.025	36	0.18			23.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.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 Coeffiecient	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 0 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
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)	2, 30, 100, 101
Climate Change (%)	0, 0, 50, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Winter	30	+0%	100/15 Summer				89.251	-0.081	0.000
1.001	2	15 Winter	30	+0%	100/15 Summer				89.105	-0.090	0.000
2.000	3	15 Winter	30	+0%	100/15 Summer				89.875	-0.131	0.000
1.002	4	15 Winter	30	+0%	100/15 Summer				89.028	-0.006	0.000
1.003	5	15 Winter	30	+0%	100/15 Summer				88.648	-0.132	0.000
3.000	6	15 Winter	30	+0%	100/15 Summer				89.460	-0.178	0.000
4.000	7	15 Winter	30	+0%	100/15 Winter				89.858	-0.135	0.000
3.001	8	15 Winter	30	+0%	100/15 Summer				89.111	-0.111	0.000
3.002	9	15 Winter	30	+0%	30/15 Summer	100/15 Winter			88.341	0.322	0.000
3.003	10	15 Winter	30	+0%	30/15 Summer				88.281	0.306	0.000
3.004	11	15 Winter	30	+0%	30/15 Summer				88.214	0.272	0.000
3.005	12	15 Winter	30	+0%	30/15 Summer				88.135	0.246	0.000
1.004	13	15 Winter	30	+0%	30/15 Summer				88.055	0.215	0.000
1.005	14	15 Winter	30	+0%	100/15 Summer				87.553	-0.151	0.000
5.000	15	15 Winter	30	+0%	100/15 Summer				87.428	-0.172	0.000
5.001	16	15 Winter	30	+0%	100/15 Summer				87.120	-0.148	0.000
1.006	17	15 Winter	30	+0%	30/15 Winter				86.937	0.049	0.000
1.007	18	15 Winter	30	+0%	100/15 Summer				86.270	-0.123	0.000
1.008	19	15 Winter	30	+0%	100/15 Summer				84.989	-0.131	0.000
6.000	20	15 Winter	30	+0%					84.746	-0.120	0.000
1.009	21	15 Winter	30	+0%	100/15 Summer				84.143	-0.149	0.000
1.010	22	15 Winter	30	+0%					81.585	-0.170	0.000
1.011	23	15 Winter	30	+0%	2/15 Winter				79.858	0.241	0.000
1.012	24	15 Winter	30	+0%	30/15 Summer				79.700	0.112	0.000
1.013	25	15 Winter	30	+0%					79.146	-0.854	0.000

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.86			55.9	OK	
1.001	2	0.70			60.5	OK	
2.000	3	0.36			30.7	OK	
1.002	4	1.00			101.9	OK	
1.003	5	0.59			121.5	OK	
3.000	6	0.10			8.7	OK	
4.000	7	0.33			30.4	OK	
3.001	8	0.49			44.9	OK	
3.002	9	0.76			67.7	SURCHARGED	1
3.003	10	0.84			71.4	SURCHARGED	
3.004	11	0.93			86.5	SURCHARGED	
3.005	12	1.09			100.7	SURCHARGED	
1.004	13	1.61			232.5	SURCHARGED	
1.005	14	0.66			233.7	OK	
5.000	15	0.36			29.3	OK	
5.001	16	0.49			55.9	OK	
1.006	17	1.05			289.7	SURCHARGED	
1.007	18	0.77			294.8	OK	
1.008	19	0.83			317.0	OK	
6.000	20	0.43			27.7	OK	
1.009	21	0.77			360.3	OK	
1.010	22	0.69			373.0	OK	
1.011	23	2.00			387.8	SURCHARGED	
1.012	24	2.25			395.6	SURCHARGED	
1.013	25	0.03			396.7	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)
1.014	26	15 Winter	30	+0%					77.541	-1.714	0.000
1.015	27	15 Winter	30	+0%					75.862	-1.751	0.000
1.016	28	15 Winter	30	+0%					74.186	-1.747	0.000
1.017	29	15 Winter	30	+0%					72.468	-1.792	0.000
1.018	30	15 Winter	30	+0%					70.479	-2.058	0.000
1.019	31	15 Winter	30	+0%					68.522	-2.014	0.000
1.020	32	15 Winter	30	+0%					66.780	-1.797	0.000
1.021	dummy	15 Winter	30	+0%					66.626	-1.516	0.000
1.022	33	15 Winter	30	+0%					65.182	-1.672	0.000
1.023	34	240 Winter	30	+0%					63.416	-2.184	0.000
1.024	35	240 Winter	30	+0%	2/15 Summer				63.414	0.472	0.000
1.025	36	720 Summer	30	+0%					62.347	-0.160	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.014	26	0.01			396.6	OK	
1.015	27	0.01			395.2	OK	
1.016	28	0.01			392.5	OK	
1.017	29	0.01			391.5	OK	
1.018	30	0.01			393.5	OK	
1.019	31	0.01			394.8	OK	
1.020	32	0.01			395.2	OK	
1.021	dummy	0.01			394.5	OK	
1.022	33	0.01			392.6	OK	
1.023	34	0.00			121.4	OK	
1.024	35	0.34			23.5	SURCHARGED	
1.025	36	0.18			23.5	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.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 Coeffiecient	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 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	16.000
Region	England and Wales	Ratio R	0.268
Cv (Summer)	0.750		
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)	2, 30, 100, 101
Climate Change (%)	0, 0, 50, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Winter	100	+50%	100/15 Summer				90.471	1.139	0.000
1.001	2	15 Winter	100	+50%	100/15 Summer				90.299	1.104	0.000
2.000	3	15 Winter	100	+50%	100/15 Summer				90.374	0.368	0.000
1.002	4	15 Winter	100	+50%	100/15 Summer				90.163	1.129	0.000
1.003	5	15 Winter	100	+50%	100/15 Summer				89.718	0.938	0.000
3.000	6	15 Winter	100	+50%	100/15 Summer				89.923	0.285	0.000
4.000	7	15 Winter	100	+50%	100/15 Winter				90.063	0.070	0.000
3.001	8	15 Winter	100	+50%	100/15 Summer				89.910	0.688	0.000
3.002	9	15 Winter	100	+50%	30/15 Summer	100/15 Winter			89.415	1.396	0.982
3.003	10	15 Winter	100	+50%	30/15 Summer				89.383	1.408	0.000
3.004	11	15 Winter	100	+50%	30/15 Summer				89.355	1.414	0.000
3.005	12	15 Winter	100	+50%	30/15 Summer				89.284	1.395	0.000
1.004	13	15 Winter	100	+50%	30/15 Summer				89.171	1.331	0.000
1.005	14	15 Winter	100	+50%	100/15 Summer				88.554	0.850	0.000
5.000	15	15 Winter	100	+50%	100/15 Summer				88.195	0.595	0.000
5.001	16	15 Winter	100	+50%	100/15 Summer				88.097	0.829	0.000
1.006	17	15 Winter	100	+50%	30/15 Winter				87.946	1.058	0.000
1.007	18	15 Winter	100	+50%	100/15 Summer				86.968	0.575	0.000
1.008	19	15 Winter	100	+50%	100/15 Summer				85.597	0.478	0.000
6.000	20	15 Winter	100	+50%					84.813	-0.053	0.000
1.009	21	15 Winter	100	+50%	100/15 Summer				84.498	0.206	0.000
1.010	22	15 Winter	100	+50%					81.664	-0.091	0.000
1.011	23	15 Winter	100	+50%	2/15 Winter				80.183	0.566	0.000
1.012	24	15 Winter	100	+50%	30/15 Summer				79.866	0.277	0.000
1.013	25	15 Winter	100	+50%					79.182	-0.818	0.000

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	1.12			73.2	FLOOD RISK	
1.001	2	0.93			79.9	SURCHARGED	
2.000	3	0.64			54.2	SURCHARGED	
1.002	4	1.36			138.6	SURCHARGED	
1.003	5	0.78			160.6	SURCHARGED	
3.000	6	0.18			15.9	SURCHARGED	
4.000	7	0.63			57.8	SURCHARGED	
3.001	8	0.72			65.0	SURCHARGED	
3.002	9	1.12			100.6	FLOOD	1
3.003	10	1.20			101.7	FLOOD RISK	
3.004	11	1.38			128.6	SURCHARGED	
3.005	12	1.63			150.1	SURCHARGED	
1.004	13	2.18			314.4	SURCHARGED	
1.005	14	0.87			307.0	SURCHARGED	
5.000	15	0.61			48.9	SURCHARGED	
5.001	16	0.62			70.5	SURCHARGED	
1.006	17	1.40			386.7	SURCHARGED	
1.007	18	1.04			397.2	SURCHARGED	
1.008	19	1.15			438.8	SURCHARGED	
6.000	20	0.82			53.0	OK	
1.009	21	1.09			510.4	SURCHARGED	
1.010	22	0.99			532.0	OK	
1.011	23	2.86			554.9	SURCHARGED	
1.012	24	3.22			565.7	SURCHARGED	
1.013	25	0.05			566.4	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)
1.014	26	15 Winter	100	+50%					77.567	-1.688	0.000
1.015	27	15 Winter	100	+50%					75.891	-1.722	0.000
1.016	28	15 Winter	100	+50%					74.214	-1.719	0.000
1.017	29	15 Winter	100	+50%					72.497	-1.763	0.000
1.018	30	15 Winter	100	+50%					70.513	-2.024	0.000
1.019	31	15 Winter	100	+50%					68.556	-1.980	0.000
1.020	32	15 Winter	100	+50%					66.810	-1.767	0.000
1.021	dummy	15 Winter	100	+50%					66.653	-1.489	0.000
1.022	33	15 Winter	100	+50%					65.211	-1.643	0.000
1.023	34	480 Winter	100	+50%					63.958	-1.642	0.000
1.024	35	480 Winter	100	+50%	2/15 Summer				63.955	1.013	0.000
1.025	36	720 Winter	100	+50%					62.347	-0.160	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.014	26	0.01			566.4	OK	
1.015	27	0.01			566.0	OK	
1.016	28	0.01			565.1	OK	
1.017	29	0.01			563.7	OK	
1.018	30	0.01			564.5	OK	
1.019	31	0.01			565.3	OK	
1.020	32	0.01			565.7	OK	
1.021	dummy	0.02			565.6	OK	
1.022	33	0.01			565.1	OK	
1.023	34	0.00			147.4	OK	
1.024	35	0.34			23.5	SURCHARGED	
1.025	36	0.18			23.5	OK	

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.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 Coeffiecient	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 0 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
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)	2, 30, 100, 101
Climate Change (%)	0, 0, 50, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Winter	101	+0%	100/15 Summer				89.404	0.072	0.000
1.001	2	15 Winter	101	+0%	100/15 Summer				89.267	0.072	0.000
2.000	3	15 Winter	101	+0%	100/15 Summer				89.890	-0.116	0.000
1.002	4	15 Winter	101	+0%	100/15 Summer				89.158	0.124	0.000
1.003	5	15 Winter	101	+0%	100/15 Summer				88.701	-0.079	0.000
3.000	6	15 Winter	101	+0%	100/15 Summer				89.465	-0.173	0.000
4.000	7	15 Winter	101	+0%	100/15 Winter				89.871	-0.122	0.000
3.001	8	15 Winter	101	+0%	100/15 Summer				89.129	-0.093	0.000
3.002	9	15 Winter	101	+0%	30/15 Summer	100/15 Winter			88.537	0.518	0.000
3.003	10	15 Winter	101	+0%	30/15 Summer				88.487	0.512	0.000
3.004	11	15 Winter	101	+0%	30/15 Summer				88.450	0.508	0.000
3.005	12	15 Winter	101	+0%	30/15 Summer				88.365	0.476	0.000
1.004	13	15 Winter	101	+0%	30/15 Summer				88.249	0.409	0.000
1.005	14	15 Winter	101	+0%	100/15 Summer				87.702	-0.002	0.000
5.000	15	15 Winter	101	+0%	100/15 Summer				87.448	-0.152	0.000
5.001	16	15 Winter	101	+0%	100/15 Summer				87.299	0.031	0.000
1.006	17	15 Winter	101	+0%	30/15 Winter				87.167	0.279	0.000
1.007	18	15 Winter	101	+0%	100/15 Summer				86.303	-0.090	0.000
1.008	19	15 Winter	101	+0%	100/15 Summer				85.091	-0.028	0.000
6.000	20	15 Winter	101	+0%					84.762	-0.104	0.000
1.009	21	15 Winter	101	+0%	100/15 Summer				84.188	-0.104	0.000
1.010	22	15 Winter	101	+0%					81.627	-0.128	0.000
1.011	23	15 Winter	101	+0%	2/15 Winter				80.003	0.386	0.000
1.012	24	15 Winter	101	+0%	30/15 Summer				79.771	0.183	0.000
1.013	25	15 Winter	101	+0%					79.165	-0.835	0.000

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	1.01			65.9	SURCHARGED	
1.001	2	0.84			72.1	SURCHARGED	
2.000	3	0.47			39.3	OK	
1.002	4	1.22			124.3	SURCHARGED	
1.003	5	0.70			142.8	OK	
3.000	6	0.12			11.1	OK	
4.000	7	0.42			39.0	OK	
3.001	8	0.63			57.5	OK	
3.002	9	0.99			88.5	SURCHARGED	1
3.003	10	1.11			93.8	SURCHARGED	
3.004	11	1.22			113.0	SURCHARGED	
3.005	12	1.40			128.6	SURCHARGED	
1.004	13	1.99			287.4	SURCHARGED	
1.005	14	0.81			285.8	OK	
5.000	15	0.47			37.6	OK	
5.001	16	0.61			69.1	SURCHARGED	
1.006	17	1.26			346.3	SURCHARGED	
1.007	18	0.92			353.2	OK	
1.008	19	1.00			382.9	OK	
6.000	20	0.55			35.4	OK	
1.009	21	0.93			437.7	OK	
1.010	22	0.84			454.5	OK	
1.011	23	2.43			471.3	SURCHARGED	
1.012	24	2.72			478.7	SURCHARGED	
1.013	25	0.04			478.3	OK	

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7843 - SW 7 REV J REVISED SWALE.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.014	26	15 Winter	101	+0%					77.555	-1.700	0.000
1.015	27	15 Winter	101	+0%					75.879	-1.734	0.000
1.016	28	15 Winter	101	+0%					74.202	-1.731	0.000
1.017	29	15 Winter	101	+0%					72.486	-1.774	0.000
1.018	30	15 Winter	101	+0%					70.496	-2.041	0.000
1.019	31	15 Winter	101	+0%					68.538	-1.998	0.000
1.020	32	15 Winter	101	+0%					66.797	-1.780	0.000
1.021	dummy	15 Winter	101	+0%					66.639	-1.503	0.000
1.022	33	15 Winter	101	+0%					65.199	-1.655	0.000
1.023	34	240 Winter	101	+0%					63.585	-2.015	0.000
1.024	35	240 Winter	101	+0%	2/15 Summer				63.583	0.641	0.000
1.025	36	1440 Winter	101	+0%					62.347	-0.160	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.014	26	0.01			477.1	OK	
1.015	27	0.01			475.3	OK	
1.016	28	0.01			474.2	OK	
1.017	29	0.01			476.0	OK	
1.018	30	0.01			477.1	OK	
1.019	31	0.01			477.4	OK	
1.020	32	0.01			476.9	OK	
1.021	dummy	0.01			475.7	OK	
1.022	33	0.01			473.9	OK	
1.023	34	0.00			159.5	OK	
1.024	35	0.34			23.5	SURCHARGED	
1.025	36	0.18			23.5	OK	