


Appendix 7a – Drainage Model Files - Existing 'Arena Area'


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Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...	Monarchs Quay Existing Arena Outlet	
Date 20/11/2017 File OUTFALL 1200.mdx	Designed by S.McLean Checked by	
XP Solutions	Network 2017.1.2	

Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	51.319	0.200	256.6	0.213	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	54.917	0.260	211.2	0.169	0.00	0.0	0.013	o	450	Pipe/Conduit
2.000	42.272	1.800	23.5	0.098	5.00	0.0	0.013	o	225	Pipe/Conduit
2.001	21.880	0.547	40.0	0.015	0.00	0.0	0.013	o	225	Pipe/Conduit
1.002	90.086	0.210	429.0	0.446	0.00	0.0	0.013	o	525	Pipe/Conduit
1.003	75.701	0.160	473.1	0.262	0.00	0.0	0.013	o	525	Pipe/Conduit
1.004	55.589	0.125	444.7	0.151	0.00	0.0	0.013	o	525	Pipe/Conduit
3.000	56.476	0.540	104.6	0.166	5.00	0.0	0.013	o	300	Pipe/Conduit
4.000	61.565	0.410	150.2	0.347	5.00	0.0	0.013	o	300	Pipe/Conduit
1.005	59.467	0.105	566.4	0.225	0.00	0.0	0.013	o	525	Pipe/Conduit
5.000	45.627	0.570	80.0	0.377	5.00	0.0	0.013	o	300	Pipe/Conduit
1.006	50.475	0.200	252.4	0.063	0.00	0.0	0.013	o	600	Pipe/Conduit
1.007	22.365	0.050	447.3	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit
1.008	90.568	0.229	395.5	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.900	0.213	0.0	0.85	60.4
1.001	5.550	0.382	0.0	1.23	196.2
2.000	8.800	0.098	0.0	2.33	92.7
2.001	7.000	0.113	0.0	1.79	71.0
1.002	5.290	0.941	0.0	0.96	207.6
1.003	5.080	1.203	0.0	0.91	197.7
1.004	4.920	1.354	0.0	0.94	203.9
3.000	5.590	0.166	0.0	1.34	94.6
4.000	5.590	0.347	0.0	1.12	78.9
1.005	4.795	2.092	0.0	0.83	180.7
5.000	5.560	0.377	0.0	1.53	108.1
1.006	4.690	2.532	0.0	1.37	386.5
1.007	4.490	2.532	0.0	1.03	290.3
1.008	4.440	2.532	0.0	1.09	308.7


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
6.000	17.500	0.219	80.0	0.633	5.00	0.0	0.013	o	375	Pipe/Conduit
6.001	47.600	0.148	321.6	0.303	0.00	0.0	0.013	o	450	Pipe/Conduit
7.000	74.000	0.514	144.0	0.517	5.00	0.0	0.013	o	375	Pipe/Conduit
1.009	11.002	0.031	354.9	0.000	0.00	0.0	0.013	o	675	Pipe/Conduit
1.010	109.581	0.300	365.3	0.200	0.00	0.0	0.013	o	750	Pipe/Conduit
8.000	47.126	0.270	174.5	0.423	5.00	0.0	0.013	o	300	Pipe/Conduit
9.000	18.670	0.107	174.5	0.415	5.00	0.0	0.013	o	375	Pipe/Conduit
8.001	42.561	0.225	189.2	0.135	0.00	0.0	0.013	o	525	Pipe/Conduit
8.002	23.568	0.055	428.5	0.083	0.00	0.0	0.013	o	600	Pipe/Conduit
10.000	97.657	3.100	31.5	0.785	5.00	0.0	0.013	o	375	Pipe/Conduit
8.003	49.095	0.110	446.3	0.099	0.00	0.0	0.013	o	600	Pipe/Conduit
8.004	43.039	0.085	506.3	0.921	0.00	0.0	0.013	o	600	Pipe/Conduit
8.005	15.640	0.040	391.0	1.047	0.00	0.0	0.013	o	600	Pipe/Conduit
1.011	151.065	0.302	500.2	0.409	0.00	0.0	0.013	o	750	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
6.000	6.325	0.633	0.0	1.77	196.0
6.001	6.081	0.936	0.0	1.00	159.0
7.000	6.325	0.517	0.0	1.32	146.1
1.009	4.211	3.985	0.0	1.25	446.2
1.010	4.180	4.185	0.0	1.32	582.5
8.000	5.700	0.423	0.0	1.04	73.2
9.000	5.507	0.415	0.0	1.20	132.7
8.001	5.000	0.973	0.0	1.44	312.7
8.002	4.700	1.056	0.0	1.05	296.6
10.000	8.000	0.785	0.0	2.83	312.4
8.003	4.645	1.940	0.0	1.03	290.6
8.004	4.535	2.861	0.0	0.97	272.9
8.005	4.450	3.908	0.0	1.10	310.5
1.011	3.880	8.502	0.0	1.13	497.8


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
11.000	86.676	1.445	60.0	1.520	5.00	0.0	0.013	o	600	Pipe/Conduit
11.001	67.726	2.255	30.0	1.000	0.00	0.0	0.013	o	600	Pipe/Conduit
11.002	53.592	0.200	268.0	0.443	0.00	0.0	0.013	o	750	Pipe/Conduit
1.012	6.892	0.100	68.9	0.000	0.00	0.0	0.013	o	1200	Pipe/Conduit


Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
11.000	8.000	1.520	0.0	2.80	792.7
11.001	6.555	2.520	0.0	3.96	1120.4
11.002	4.150	2.963	0.0	1.54	680.1
1.012	3.100	11.465	0.0	4.15	4696.2

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Manhole Schedules for OUTFALL 1200.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.770	0.870	Open Manhole	1200	1.000	5.900	300				
2	7.210	1.660	Open Manhole	1350	1.001	5.550	450	1.000	5.700	300	
20	10.000	1.200	Open Manhole	1200	2.000	8.800	225				
21	8.500	1.500	Open Manhole	1200	2.001	7.000	225	2.000	7.000	225	
3	7.440	2.150	Open Manhole	1500	1.002	5.290	525	1.001	5.290	450	
								2.001	6.453	225	863
4	7.160	2.080	Open Manhole	1500	1.003	5.080	525	1.002	5.080	525	
5	7.110	2.190	Open Manhole	1500	1.004	4.920	525	1.003	4.920	525	
30	8.010	2.420	Open Manhole	1200	3.000	5.590	300				
40	7.470	1.880	Open Manhole	1200	4.000	5.590	300				
6	7.470	2.675	Open Manhole	1500	1.005	4.795	525	1.004	4.795	525	
								3.000	5.050	300	30
								4.000	5.180	300	160
50	7.660	2.100	Open Manhole	1200	5.000	5.560	300				
7	8.300	3.610	Open Manhole	1500	1.006	4.690	600	1.005	4.690	525	
								5.000	4.990	300	
13	7.630	3.140	Open Manhole	2100	1.007	4.490	600	1.006	4.490	600	
8	7.885	3.445	Open Manhole	1800	1.008	4.440	600	1.007	4.440	600	
60	7.900	1.575	Open Manhole	1200	6.000	6.325	375				
61	7.900	1.819	Open Manhole	1200	6.001	6.081	450	6.000	6.106	375	
70	7.900	1.575	Open Manhole	1350	7.000	6.325	375				
9	7.900	3.689	Open Manhole	1800	1.009	4.211	675	1.008	4.211	600	
								6.001	5.933	450	1497
								7.000	5.811	375	1300
10	7.260	3.080	Open Manhole	1800	1.010	4.180	750	1.009	4.180	675	
80	7.470	1.770	Open Manhole	1200	8.000	5.700	300				
90	7.310	1.803	Open Manhole	1350	9.000	5.507	375				
81	7.200	2.200	Open Manhole	1350	8.001	5.000	525	8.000	5.430	300	205
								9.000	5.400	375	250
82	7.840	3.140	Open Manhole	1500	8.002	4.700	600	8.001	4.775	525	
100	10.000	2.000	Open Manhole	1200	10.000	8.000	375				
83	8.070	3.425	Open Manhole	1500	8.003	4.645	600	8.002	4.645	600	
								10.000	4.900	375	30
84	7.960	3.425	Open Manhole	1500	8.004	4.535	600	8.003	4.535	600	
85	7.960	3.510	Open Manhole	1500	8.005	4.450	600	8.004	4.450	600	
11	7.340	3.460	Open Manhole	1800	1.011	3.880	750	1.010	3.880	750	
								8.005	4.410	600	380
110	10.000	2.000	Open Manhole	1500	11.000	8.000	600				

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Manhole Schedules for OUTFALL 1200.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
111	8.500	1.945	Open Manhole	1500	11.001	6.555	600	11.000	6.555	600	
112	7.500	3.350	Open Manhole	1800	11.002	4.150	750	11.001	4.300	600	
12	7.500	4.400	Open Manhole	2200	1.012	3.100	1200	1.011	3.578	750	28
								11.002	3.950	750	400
13	7.500	4.500	Open Manhole	0		OUTFALL		1.012	3.000	1200	

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PIPELINE SCHEDULES for OUTFALL 1200.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	6.770	5.900	0.570	Open Manhole	1200
1.001	o	450	2	7.210	5.550	1.210	Open Manhole	1350
2.000	o	225	20	10.000	8.800	0.975	Open Manhole	1200
2.001	o	225	21	8.500	7.000	1.275	Open Manhole	1200
1.002	o	525	3	7.440	5.290	1.625	Open Manhole	1500
1.003	o	525	4	7.160	5.080	1.555	Open Manhole	1500
1.004	o	525	5	7.110	4.920	1.665	Open Manhole	1500
3.000	o	300	30	8.010	5.590	2.120	Open Manhole	1200
4.000	o	300	40	7.470	5.590	1.580	Open Manhole	1200
1.005	o	525	6	7.470	4.795	2.150	Open Manhole	1500
5.000	o	300	50	7.660	5.560	1.800	Open Manhole	1200
1.006	o	600	7	8.300	4.690	3.010	Open Manhole	1500
1.007	o	600	13	7.630	4.490	2.540	Open Manhole	2100
1.008	o	600	8	7.885	4.440	2.845	Open Manhole	1800

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	51.319	256.6	2	7.210	5.700	1.210	Open Manhole	1350
1.001	54.917	211.2	3	7.440	5.290	1.700	Open Manhole	1500
2.000	42.272	23.5	21	8.500	7.000	1.275	Open Manhole	1200
2.001	21.880	40.0	3	7.440	6.453	0.762	Open Manhole	1500
1.002	90.086	429.0	4	7.160	5.080	1.555	Open Manhole	1500
1.003	75.701	473.1	5	7.110	4.920	1.665	Open Manhole	1500
1.004	55.589	444.7	6	7.470	4.795	2.150	Open Manhole	1500
3.000	56.476	104.6	6	7.470	5.050	2.120	Open Manhole	1500
4.000	61.565	150.2	6	7.470	5.180	1.990	Open Manhole	1500
1.005	59.467	566.4	7	8.300	4.690	3.085	Open Manhole	1500
5.000	45.627	80.0	7	8.300	4.990	3.010	Open Manhole	1500
1.006	50.475	252.4	13	7.630	4.490	2.540	Open Manhole	2100
1.007	22.365	447.3	8	7.885	4.440	2.845	Open Manhole	1800
1.008	90.568	395.5	9	7.900	4.211	3.089	Open Manhole	1800

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PIPELINE SCHEDULES for OUTFALL 1200.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)
6.000	o	375	60	7.900	6.325	1.200	Open Manhole	1200
6.001	o	450	61	7.900	6.081	1.369	Open Manhole	1200
7.000	o	375	70	7.900	6.325	1.200	Open Manhole	1350
1.009	o	675	9	7.900	4.211	3.014	Open Manhole	1800
1.010	o	750	10	7.260	4.180	2.330	Open Manhole	1800
8.000	o	300	80	7.470	5.700	1.470	Open Manhole	1200
9.000	o	375	90	7.310	5.507	1.428	Open Manhole	1350
8.001	o	525	81	7.200	5.000	1.675	Open Manhole	1350
8.002	o	600	82	7.840	4.700	2.540	Open Manhole	1500
10.000	o	375	100	10.000	8.000	1.625	Open Manhole	1200
8.003	o	600	83	8.070	4.645	2.825	Open Manhole	1500
8.004	o	600	84	7.960	4.535	2.825	Open Manhole	1500
8.005	o	600	85	7.960	4.450	2.910	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)
6.000	17.500	80.0	61	7.900	6.106	1.419	Open Manhole	1200
6.001	47.600	321.6	9	7.900	5.933	1.517	Open Manhole	1800
7.000	74.000	144.0	9	7.900	5.811	1.714	Open Manhole	1800
1.009	11.002	354.9	10	7.260	4.180	2.405	Open Manhole	1800
1.010	109.581	365.3	11	7.340	3.880	2.710	Open Manhole	1800
8.000	47.126	174.5	81	7.200	5.430	1.470	Open Manhole	1350
9.000	18.670	174.5	81	7.200	5.400	1.425	Open Manhole	1350
8.001	42.561	189.2	82	7.840	4.775	2.540	Open Manhole	1500
8.002	23.568	428.5	83	8.070	4.645	2.825	Open Manhole	1500
10.000	97.657	31.5	83	8.070	4.900	2.795	Open Manhole	1500
8.003	49.095	446.3	84	7.960	4.535	2.825	Open Manhole	1500
8.004	43.039	506.3	85	7.960	4.450	2.910	Open Manhole	1500
8.005	15.640	391.0	11	7.340	4.410	2.330	Open Manhole	1800

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PIPELINE SCHEDULES for OUTFALL 1200.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)
1.011	o	750	11	7.340	3.880	2.710	Open Manhole	1800
11.000	o	600	110	10.000	8.000	1.400	Open Manhole	1500
11.001	o	600	111	8.500	6.555	1.345	Open Manhole	1500
11.002	o	750	112	7.500	4.150	2.600	Open Manhole	1800
1.012	o	1200	12	7.500	3.100	3.200	Open Manhole	2200

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)
1.011	151.065	500.2	12	7.500	3.578	3.172	Open Manhole	2200
11.000	86.676	60.0	111	8.500	6.555	1.345	Open Manhole	1500
11.001	67.726	30.0	112	7.500	4.300	2.600	Open Manhole	1800
11.002	53.592	268.0	12	7.500	3.950	2.800	Open Manhole	2200
1.012	6.892	68.9	13	7.500	3.000	3.300	Open Manhole	0

Surcharged Outfall Details for OUTFALL 1200.SWS

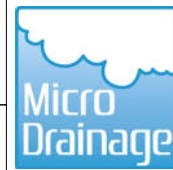
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.012 13 7.500 3.000 3.000 0 0

Datum (m) 3.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	2.450	11	2.450	21	2.450	31	2.450	41	2.450	51	2.450
2	2.450	12	2.450	22	2.450	32	2.450	42	2.450	52	2.450
3	2.450	13	2.450	23	2.450	33	2.450	43	2.450	53	2.450
4	2.450	14	2.450	24	2.450	34	2.450	44	2.450	54	2.450
5	2.450	15	2.450	25	2.450	35	2.450	45	2.450	55	2.450
6	2.450	16	2.450	26	2.450	36	2.450	46	2.450	56	2.450
7	2.450	17	2.450	27	2.450	37	2.450	47	2.450	57	2.450
8	2.450	18	2.450	28	2.450	38	2.450	48	2.450	58	2.450
9	2.450	19	2.450	29	2.450	39	2.450	49	2.450	59	2.450
10	2.450	20	2.450	30	2.450	40	2.450	50	2.450	60	2.450

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Surcharged Outfall Details for OUTFALL 1200.SWS

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
61	2.450	91	2.450	121	2.450	151	2.450	181	2.450	211	2.450
62	2.450	92	2.450	122	2.450	152	2.450	182	2.450	212	2.450
63	2.450	93	2.450	123	2.450	153	2.450	183	2.450	213	2.450
64	2.450	94	2.450	124	2.450	154	2.450	184	2.450	214	2.450
65	2.450	95	2.450	125	2.450	155	2.450	185	2.450	215	2.450
66	2.450	96	2.450	126	2.450	156	2.450	186	2.450	216	2.450
67	2.450	97	2.450	127	2.450	157	2.450	187	2.450	217	2.450
68	2.450	98	2.450	128	2.450	158	2.450	188	2.450	218	2.450
69	2.450	99	2.450	129	2.450	159	2.450	189	2.450	219	2.450
70	2.450	100	2.450	130	2.450	160	2.450	190	2.450	220	2.450
71	2.450	101	2.450	131	2.450	161	2.450	191	2.450	221	2.450
72	2.450	102	2.450	132	2.450	162	2.450	192	2.450	222	2.450
73	2.450	103	2.450	133	2.450	163	2.450	193	2.450	223	2.450
74	2.450	104	2.450	134	2.450	164	2.450	194	2.450	224	2.450
75	2.450	105	2.450	135	2.450	165	2.450	195	2.450	225	2.450
76	2.450	106	2.450	136	2.450	166	2.450	196	2.450	226	2.450
77	2.450	107	2.450	137	2.450	167	2.450	197	2.450	227	2.450
78	2.450	108	2.450	138	2.450	168	2.450	198	2.450	228	2.450
79	2.450	109	2.450	139	2.450	169	2.450	199	2.450	229	2.450
80	2.450	110	2.450	140	2.450	170	2.450	200	2.450	230	2.450
81	2.450	111	2.450	141	2.450	171	2.450	201	2.450	231	2.450
82	2.450	112	2.450	142	2.450	172	2.450	202	2.450	232	2.450
83	2.450	113	2.450	143	2.450	173	2.450	203	2.450	233	2.450
84	2.450	114	2.450	144	2.450	174	2.450	204	2.450	234	2.450
85	2.450	115	2.450	145	2.450	175	2.450	205	2.450	235	2.450
86	2.450	116	2.450	146	2.450	176	2.450	206	2.450	236	2.450
87	2.450	117	2.450	147	2.450	177	2.450	207	2.450	237	2.450
88	2.450	118	2.450	148	2.450	178	2.450	208	2.450	238	2.450
89	2.450	119	2.450	149	2.450	179	2.450	209	2.450	239	2.450
90	2.450	120	2.450	150	2.450	180	2.450	210	2.450	240	2.450


Simulation Criteria for OUTFALL 1200.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 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 Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000
 Return Period (years) 2 Ratio R 0.400
 Region England and Wales Profile Type Summer


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<div>Synthetic Rainfall Details</div> <div>Cv (Summer) 0.750 Storm Duration (mins) 30 Cv (Winter) 0.840</div>		
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XP Solutions				Network 2017.1.2				
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for OUTFALL 1200.SWS</u>								
<u>Simulation Criteria</u>								
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 Storage Structures 0								
Number of Online Controls 0 Number of Time/Area Diagrams 0								
Number of Offline Controls 0 Number of Real Time Controls 0								
<u>Synthetic Rainfall Details</u>								
Rainfall Model FSR Ratio R 0.400								
Region England and Wales Cv (Summer) 0.750								
M5-60 (mm) 20.000 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, 2160, 2880, 4320, 5760, 7200, 8640, 10080								
Return Period(s) (years) 1, 30, 100								
Climate Change (%) 0, 0, 30								

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	1	-0.147	0.000	0.51		29.2	OK	22
1.001	2	0.026	0.000	0.21		39.0	SURCHARGED	12
2.000	20	-0.166	0.000	0.15		13.4	OK	
2.001	21	-0.151	0.000	0.23		15.2	OK	
1.002	3	0.199	0.000	0.39		76.3	SURCHARGED	2
1.003	4	0.383	0.000	0.36		66.2	SURCHARGED	17
1.004	5	0.512	0.000	0.36		66.9	SURCHARGED	18
3.000	30	0.056	0.000	0.20		17.8	SURCHARGED	1
4.000	40	0.073	0.000	0.49		37.4	SURCHARGED	15
1.005	6	0.611	0.000	0.57		94.8	SURCHARGED	5
5.000	50	0.064	0.000	0.40		40.8	SURCHARGED	10
1.006	7	0.602	0.000	0.32		111.3	SURCHARGED	
1.007	13	0.775	0.000	0.48		112.4	SURCHARGED	
1.008	8	0.810	0.000	0.38		110.7	SURCHARGED	
6.000	60	-0.180	0.000	0.52		87.3	OK	6
6.001	61	-0.132	0.000	0.83		122.0	OK	
7.000	70	-0.183	0.000	0.51		72.0	OK	6
1.009	9	0.941	0.000	0.56		151.0	SURCHARGED	
1.010	10	0.880	0.000	0.29		159.9	SURCHARGED	9

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	80	30 Winter	1	+0%	1/30 Winter	30/15 Summer		
9.000	90	30 Winter	1	+0%	1/15 Winter	30/15 Summer		
8.001	81	30 Winter	1	+0%	1/15 Summer	30/15 Summer		
8.002	82	30 Winter	1	+0%	1/15 Summer	100/15 Summer		
10.000	100	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
8.003	83	30 Winter	1	+0%	1/15 Summer			
8.004	84	30 Winter	1	+0%	1/15 Summer	100/15 Summer		
8.005	85	30 Winter	1	+0%	1/15 Summer	100/15 Summer		
1.011	11	30 Winter	1	+0%	1/15 Summer	100/15 Summer		
11.000	110	15 Winter	1	+0%	100/15 Summer			
11.001	111	15 Winter	1	+0%	30/15 Winter	100/15 Summer		
11.002	112	15 Winter	1	+0%	1/15 Summer			
1.012	12	30 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water			Flooded		Pipe		Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	
8.000	80	6.031	0.031	0.000	0.65		45.3	SURCHARGED	15
9.000	90	6.003	0.121	0.000	0.38		43.6	SURCHARGED	13
8.001	81	5.986	0.461	0.000	0.30		83.8	SURCHARGED	17
8.002	82	5.962	0.662	0.000	0.30		72.3	SURCHARGED	2
10.000	100	8.156	-0.219	0.000	0.35		107.1	OK	4
8.003	83	5.946	0.701	0.000	0.55		143.3	SURCHARGED	
8.004	84	5.909	0.774	0.000	0.91		218.3	SURCHARGED	4
8.005	85	5.841	0.791	0.000	1.46		304.5	SURCHARGED	2
1.011	11	5.774	1.144	0.000	0.91		432.0	SURCHARGED	3
11.000	110	8.219	-0.381	0.000	0.28		207.8	OK	
11.001	111	6.781	-0.374	0.000	0.31		315.7	OK	2
11.002	112	5.534	0.634	0.000	0.54		319.4	SURCHARGED	
1.012	12	5.465	1.165	0.000	0.32		632.8	SURCHARGED	

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XP Solutions	Network 2017.1.2	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.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 Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 20.000 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, 2160, 2880, 4320, 5760,
 7200, 8640, 10080
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 30

US/MH		Return Climate		First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Level
							Act.	(m)
1.000	1 60 Winter		30	+0%	30/15 Summer	30/15 Summer		6.875
1.001	2 15 Winter		30	+0%	1/30 Winter	30/15 Summer		7.213
2.000	20 15 Winter		30	+0%				8.896
2.001	21 15 Winter		30	+0%	30/15 Summer			7.462
1.002	3 15 Summer		30	+0%	1/15 Winter	100/15 Summer		7.291
1.003	4 30 Winter		30	+0%	1/15 Summer	30/15 Summer		7.199
1.004	5 30 Winter		30	+0%	1/15 Summer	30/15 Summer		7.188
3.000	30 15 Winter		30	+0%	1/30 Winter	100/15 Winter		7.565
4.000	40 30 Winter		30	+0%	1/30 Winter	30/15 Summer		7.478
1.005	6 15 Winter		30	+0%	1/15 Summer	100/15 Summer		7.444
5.000	50 30 Winter		30	+0%	1/30 Winter	30/15 Winter		7.663
1.006	7 15 Winter		30	+0%	1/15 Summer			7.497
1.007	13 15 Winter		30	+0%	1/15 Summer			7.453
1.008	8 15 Winter		30	+0%	1/15 Summer			7.413
6.000	60 15 Winter		30	+0%	30/15 Summer	100/15 Summer		7.741
6.001	61 15 Winter		30	+0%	30/15 Summer			7.592
7.000	70 30 Winter		30	+0%	30/15 Summer	100/15 Summer		7.640
1.009	9 30 Winter		30	+0%	1/15 Summer			7.330
1.010	10 30 Winter		30	+0%	1/15 Summer	30/15 Winter		7.261

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	1	0.675	106.216	1.94		112.3	FLOOD	22
1.001	2	1.213	3.682	0.64		117.0	FLOOD	12
2.000	20	-0.129	0.000	0.37		33.1	OK	
2.001	21	0.237	0.000	0.56		36.9	SURCHARGED	
1.002	3	1.476	0.000	0.80		158.4	FLOOD RISK	2
1.003	4	1.594	39.480	0.64		118.7	FLOOD	17
1.004	5	1.743	78.325	1.20		224.8	FLOOD	18
3.000	30	1.675	0.000	0.49		44.4	SURCHARGED	1
4.000	40	1.588	8.389	0.93		70.6	FLOOD	15
1.005	6	2.124	0.000	1.52		254.3	FLOOD RISK	5
5.000	50	1.803	2.875	0.89		91.4	FLOOD	10
1.006	7	2.207	0.000	0.74		258.3	SURCHARGED	
1.007	13	2.363	0.000	1.10		258.3	FLOOD RISK	
1.008	8	2.373	0.000	0.87		253.2	SURCHARGED	
6.000	60	1.041	0.000	1.08		181.2	FLOOD RISK	6
6.001	61	1.061	0.000	1.75		257.5	SURCHARGED	
7.000	70	0.940	0.000	0.79		111.2	FLOOD RISK	6
1.009	9	2.444	0.000	1.63		441.8	SURCHARGED	
1.010	10	2.331	0.692	0.84		455.3	FLOOD	9

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 1200.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	80	15 Winter	30	+0%	1/30 Winter	30/15 Summer		
9.000	90	30 Winter	30	+0%	1/15 Winter	30/15 Summer		
8.001	81	30 Winter	30	+0%	1/15 Summer	30/15 Summer		
8.002	82	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
10.000	100	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
8.003	83	15 Winter	30	+0%	1/15 Summer			
8.004	84	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
8.005	85	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
1.011	11	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
11.000	110	15 Winter	30	+0%	100/15 Summer			
11.001	111	15 Winter	30	+0%	30/15 Winter	100/15 Summer		
11.002	112	15 Winter	30	+0%	1/15 Summer			
1.012	12	15 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water			Flooded		Pipe		Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	
8.000	80	7.480	1.480	10.484	1.10		76.6	FLOOD	15
9.000	90	7.319	1.437	8.698	0.91		104.2	FLOOD	13
8.001	81	7.297	1.772	97.533	1.03		290.4	FLOOD	17
8.002	82	7.542	2.242	0.000	1.41		339.3	FLOOD RISK	2
10.000	100	9.082	0.707	0.000	0.71		216.0	SURCHARGED	4
8.003	83	7.654	2.409	0.000	1.33		345.8	SURCHARGED	
8.004	84	7.636	2.501	0.000	1.80		435.0	SURCHARGED	4
8.005	85	7.499	2.449	0.000	3.22		672.0	SURCHARGED	2
1.011	11	7.087	2.457	0.000	1.98		938.1	FLOOD RISK	3
11.000	110	8.374	-0.226	0.000	0.69		509.7	OK	
11.001	111	7.168	0.013	0.000	0.73		758.5	SURCHARGED	2
11.002	112	5.949	1.049	0.000	1.46		870.1	SURCHARGED	
1.012	12	5.521	1.221	0.000	0.85		1669.9	SURCHARGED	

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Samuel House

5 Fox Valley Way

Stocksbridge Sheffield S36...

Monarchs Quay

Existing Arena Outlet

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.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 Storage Structures 0

Number of Online Controls 0

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.000 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, 2160, 2880, 4320, 5760, 7200, 8640, 10080

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.
1.000	1	120 Winter	100	+30%	30/15 Summer	30/15 Summer		
1.001	2	15 Winter	100	+30%	1/30 Winter	30/15 Summer		
2.000	20	15 Winter	100	+30%				
2.001	21	15 Winter	100	+30%	30/15 Summer			
1.002	3	15 Summer	100	+30%	1/15 Winter	100/15 Summer		
1.003	4	60 Winter	100	+30%	1/15 Summer	30/15 Summer		
1.004	5	60 Winter	100	+30%	1/15 Summer	30/15 Summer		
3.000	30	15 Winter	100	+30%	1/30 Winter	100/15 Winter		
4.000	40	30 Winter	100	+30%	1/30 Winter	30/15 Summer		
1.005	6	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
5.000	50	30 Winter	100	+30%	1/30 Winter	30/15 Winter		
1.006	7	30 Winter	100	+30%	1/15 Summer			
1.007	13	30 Summer	100	+30%	1/15 Summer			
1.008	8	30 Summer	100	+30%	1/15 Summer			
6.000	60	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
6.001	61	15 Winter	100	+30%	30/15 Summer			
7.000	70	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
1.009	9	30 Summer	100	+30%	1/15 Summer			
1.010	10	30 Winter	100	+30%	1/15 Summer	30/15 Winter		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)		Flow (l/s)		
1.000	1	7.034	0.834	266.017	2.06	118.7	FLOOD	22
1.001	2	7.246	1.246	36.069	0.67	121.7	FLOOD	12
2.000	20	8.931	-0.094	0.000	0.63	55.8	OK	
2.001	21	7.968	0.743	0.000	0.99	65.7	SURCHARGED	
1.002	3	7.441	1.626	1.698	1.00	196.9	FLOOD	2
1.003	4	7.323	1.718	163.242	0.81	150.6	FLOOD	17
1.004	5	7.336	1.891	227.997	1.49	279.9	FLOOD	18
3.000	30	8.010	2.120	0.234	0.96	87.0	FLOOD	1
4.000	40	7.527	1.637	57.375	1.14	86.4	FLOOD	15
1.005	6	7.482	2.162	11.952	1.85	308.5	FLOOD	5
5.000	50	7.701	1.841	41.300	1.24	127.4	FLOOD	10
1.006	7	7.594	2.304	0.000	0.88	306.2	SURCHARGED	
1.007	13	7.571	2.481	0.000	1.29	301.3	FLOOD RISK	
1.008	8	7.541	2.501	0.000	1.02	295.6	SURCHARGED	
6.000	60	7.956	1.256	56.321	1.16	195.3	FLOOD	6
6.001	61	7.890	1.359	0.000	2.01	295.7	FLOOD RISK	
7.000	70	7.929	1.229	28.901	1.09	152.8	FLOOD	6
1.009	9	7.481	2.595	0.000	1.87	507.0	SURCHARGED	
1.010	10	7.397	2.467	137.014	1.18	644.1	FLOOD	9


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Date 20/11/2017 File OUTFALL 1200.mdx	Designed by S.McLean Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	80	30 Winter	100	+30%	1/30 Winter	30/15 Summer		
9.000	90	30 Winter	100	+30%	1/15 Winter	30/15 Summer		
8.001	81	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
8.002	82	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
10.000	100	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
8.003	83	15 Summer	100	+30%	1/15 Summer			
8.004	84	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
8.005	85	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
1.011	11	30 Summer	100	+30%	1/15 Summer	100/15 Summer		
11.000	110	15 Winter	100	+30%	100/15 Summer			
11.001	111	15 Winter	100	+30%	30/15 Winter	100/15 Summer		
11.002	112	15 Winter	100	+30%	1/15 Summer			
1.012	12	30 Winter	100	+30%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
8.000	80	7.534	1.534	64.035	1.06	74.2	FLOOD	15
9.000	90	7.429	1.547	119.468	1.98	226.6	FLOOD	13
8.001	81	7.467	1.942	267.501	1.38	388.9	FLOOD	17
8.002	82	7.841	2.541	1.481	1.67	403.6	FLOOD	2
10.000	100	10.033	1.658	32.786	0.88	267.5	FLOOD	4
8.003	83	8.003	2.758	0.000	1.50	390.5	FLOOD RISK	
8.004	84	8.005	2.870	45.263	1.79	432.8	FLOOD	4
8.005	85	7.960	2.910	1.546	3.79	791.8	FLOOD	2
1.011	11	7.340	2.710	0.132	2.21	1047.6	FLOOD	3
11.000	110	9.966	1.366	0.000	0.98	725.9	FLOOD RISK	
11.001	111	8.524	1.369	23.622	0.97	1005.4	FLOOD	2
11.002	112	6.519	1.619	0.000	1.95	1164.5	SURCHARGED	
1.012	12	5.737	1.437	0.000	1.09	2148.4	SURCHARGED	

Appendix 7b – Drainage Model Files – Existing ‘Half Tide Wharf’ Area


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Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...	Monarchs Quay Existing Halftide Wharf	
Date 20/11/2017 File OUTFALL 900.mdx	Designed by S.McLean Checked by	
XP Solutions		
Network 2017.1.2		

Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	34.432	0.125	275.5	0.151	5.00	0.0	0.013	o	300	Pipe/Conduit
2.000	38.985	0.310	125.8	0.540	5.00	0.0	0.013	o	300	Pipe/Conduit
2.001	45.364	0.340	133.4	0.315	0.00	0.0	0.013	o	300	Pipe/Conduit
2.002	31.067	0.230	135.1	0.092	0.00	0.0	0.013	o	300	Pipe/Conduit
2.003	11.855	0.175	67.7	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.001	59.737	0.121	493.7	0.172	0.00	0.0	0.013	o	375	Pipe/Conduit
1.002	46.501	0.100	465.0	0.281	0.00	0.0	0.013	o	450	Pipe/Conduit
1.003	33.647	0.075	448.6	0.122	0.00	0.0	0.013	o	450	Pipe/Conduit
1.004	29.891	0.230	130.0	0.042	0.00	0.0	0.013	o	450	Pipe/Conduit
3.000	4.672	0.100	46.7	0.069	5.00	0.0	0.013	o	600	Pipe/Conduit
4.000	89.092	0.800	111.4	0.131	2.00	0.0	0.013	o	225	Pipe/Conduit
3.001	21.172	0.075	282.3	0.059	0.00	0.0	0.013	o	600	Pipe/Conduit
1.005	40.384	0.090	448.7	1.044	0.00	0.0	0.013	o	600	Pipe/Conduit
5.000	95.909	0.400	239.8	1.366	5.00	0.0	0.013	o	600	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.650	0.151	0.0	0.82	58.3
2.000	6.580	0.540	0.0	1.22	86.2
2.001	6.270	0.855	0.0	1.18	83.7
2.002	5.930	0.947	0.0	1.18	83.2
2.003	5.700	0.947	0.0	1.66	117.5
1.001	5.450	1.270	0.0	0.71	78.9
1.002	5.250	1.551	0.0	0.83	132.2
1.003	5.150	1.673	0.0	0.85	134.6
1.004	5.075	1.715	0.0	1.57	250.1
3.000	5.500	0.069	0.0	3.18	898.3
4.000	5.800	0.131	0.0	1.07	42.5
3.001	4.675	0.259	0.0	1.29	365.4
1.005	4.590	3.018	0.0	1.03	289.9
5.000	5.000	1.366	0.0	1.40	396.5


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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.006	12.545	0.100	125.5	0.000	0.00	0.0	0.013	o	900	Pipe/Conduit


Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.006	4.300	4.384	0.0	2.54	1616.3

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Manhole Schedules for OUTFALL 900.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	6.580	0.930	Open Manhole	1200	1.000	5.650	300				
10	7.980	1.400	Open Manhole	1200	2.000	6.580	300				
11	7.300	1.030	Open Manhole	1200	2.001	6.270	300	2.000	6.270	300	
12	6.930	1.000	Open Manhole	1200	2.002	5.930	300	2.001	5.930	300	
13	6.760	1.060	Open Manhole	1200	2.003	5.700	300	2.002	5.700	300	
2	6.670	1.220	Open Manhole	1350	1.001	5.450	375	1.000	5.525	300	
								2.003	5.525	300	
3	6.680	1.430	Open Manhole	1350	1.002	5.250	450	1.001	5.329	375	4
4	6.800	1.650	Open Manhole	1350	1.003	5.150	450	1.002	5.150	450	
5	7.100	2.025	Open Manhole	1350	1.004	5.075	450	1.003	5.075	450	
20	7.300	1.800	Open Manhole	1350	3.000	5.500	600				
30	7.300	1.500	Open Manhole	1200	4.000	5.800	225				
21	7.460	2.785	Open Manhole	1500	3.001	4.675	600	3.000	5.400	600	725
								4.000	5.000	225	
6	7.370	2.780	Open Manhole	1500	1.005	4.590	600	1.004	4.845	450	105
								3.001	4.600	600	10
40	7.400	2.400	Open Manhole	1500	5.000	5.000	600				
7	7.350	3.050	Open Manhole	1800	1.006	4.300	900	1.005	4.500	600	
								5.000	4.600	600	
8	7.300	3.100	Open Manhole	0		OUTFALL		1.006	4.200	900	

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PIPELINE SCHEDULES for OUTFALL 900.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	6.580	5.650	0.630	Open Manhole	1200
2.000	o	300	10	7.980	6.580	1.100	Open Manhole	1200
2.001	o	300	11	7.300	6.270	0.730	Open Manhole	1200
2.002	o	300	12	6.930	5.930	0.700	Open Manhole	1200
2.003	o	300	13	6.760	5.700	0.760	Open Manhole	1200
1.001	o	375	2	6.670	5.450	0.845	Open Manhole	1350
1.002	o	450	3	6.680	5.250	0.980	Open Manhole	1350
1.003	o	450	4	6.800	5.150	1.200	Open Manhole	1350
1.004	o	450	5	7.100	5.075	1.575	Open Manhole	1350
3.000	o	600	20	7.300	5.500	1.200	Open Manhole	1350
4.000	o	225	30	7.300	5.800	1.275	Open Manhole	1200
3.001	o	600	21	7.460	4.675	2.185	Open Manhole	1500
1.005	o	600	6	7.370	4.590	2.180	Open Manhole	1500
5.000	o	600	40	7.400	5.000	1.800	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	34.432	275.5	2	6.670	5.525	0.845	Open Manhole	1350
2.000	38.985	125.8	11	7.300	6.270	0.730	Open Manhole	1200
2.001	45.364	133.4	12	6.930	5.930	0.700	Open Manhole	1200
2.002	31.067	135.1	13	6.760	5.700	0.760	Open Manhole	1200
2.003	11.855	67.7	2	6.670	5.525	0.845	Open Manhole	1350
1.001	59.737	493.7	3	6.680	5.329	0.976	Open Manhole	1350
1.002	46.501	465.0	4	6.800	5.150	1.200	Open Manhole	1350
1.003	33.647	448.6	5	7.100	5.075	1.575	Open Manhole	1350
1.004	29.891	130.0	6	7.370	4.845	2.075	Open Manhole	1500
3.000	4.672	46.7	21	7.460	5.400	1.460	Open Manhole	1500
4.000	89.092	111.4	21	7.460	5.000	2.235	Open Manhole	1500
3.001	21.172	282.3	6	7.370	4.600	2.170	Open Manhole	1500
1.005	40.384	448.7	7	7.350	4.500	2.250	Open Manhole	1800
5.000	95.909	239.8	7	7.350	4.600	2.150	Open Manhole	1800

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PIPELINE SCHEDULES for OUTFALL 900.SWS

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
1.006	o	900	7	7.350	4.300	2.150	Open Manhole	1800

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
1.006	12.545	125.5	8	7.300	4.200	2.200	Open Manhole	0

Surcharged Outfall Details for OUTFALL 900.SWS

Outfall	Outfall	C. Level	I. Level	Min	D,L	W
Pipe	Number	Name	(m)	(m)	I. Level (mm)	(mm)
				(m)		

1.006 8 7.300 4.200 4.200 0 0

Datum (m) 4.200 Offset (mins) 0

Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth
(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)
1	1.250	23	1.250	45	1.250	67	1.250	89	1.250	111	1.250
2	1.250	24	1.250	46	1.250	68	1.250	90	1.250	112	1.250
3	1.250	25	1.250	47	1.250	69	1.250	91	1.250	113	1.250
4	1.250	26	1.250	48	1.250	70	1.250	92	1.250	114	1.250
5	1.250	27	1.250	49	1.250	71	1.250	93	1.250	115	1.250
6	1.250	28	1.250	50	1.250	72	1.250	94	1.250	116	1.250
7	1.250	29	1.250	51	1.250	73	1.250	95	1.250	117	1.250
8	1.250	30	1.250	52	1.250	74	1.250	96	1.250	118	1.250
9	1.250	31	1.250	53	1.250	75	1.250	97	1.250	119	1.250
10	1.250	32	1.250	54	1.250	76	1.250	98	1.250	120	1.250
11	1.250	33	1.250	55	1.250	77	1.250	99	1.250	121	1.250
12	1.250	34	1.250	56	1.250	78	1.250	100	1.250	122	1.250
13	1.250	35	1.250	57	1.250	79	1.250	101	1.250	123	1.250
14	1.250	36	1.250	58	1.250	80	1.250	102	1.250	124	1.250
15	1.250	37	1.250	59	1.250	81	1.250	103	1.250	125	1.250
16	1.250	38	1.250	60	1.250	82	1.250	104	1.250	126	1.250
17	1.250	39	1.250	61	1.250	83	1.250	105	1.250	127	1.250
18	1.250	40	1.250	62	1.250	84	1.250	106	1.250	128	1.250
19	1.250	41	1.250	63	1.250	85	1.250	107	1.250	129	1.250
20	1.250	42	1.250	64	1.250	86	1.250	108	1.250	130	1.250
21	1.250	43	1.250	65	1.250	87	1.250	109	1.250	131	1.250
22	1.250	44	1.250	66	1.250	88	1.250	110	1.250	132	1.250

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Surcharged Outfall Details for OUTFALL 900.SWS


Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
133	1.250	151	1.250	169	1.250	187	1.250	205	1.250	223	1.250
134	1.250	152	1.250	170	1.250	188	1.250	206	1.250	224	1.250
135	1.250	153	1.250	171	1.250	189	1.250	207	1.250	225	1.250
136	1.250	154	1.250	172	1.250	190	1.250	208	1.250	226	1.250
137	1.250	155	1.250	173	1.250	191	1.250	209	1.250	227	1.250
138	1.250	156	1.250	174	1.250	192	1.250	210	1.250	228	1.250
139	1.250	157	1.250	175	1.250	193	1.250	211	1.250	229	1.250
140	1.250	158	1.250	176	1.250	194	1.250	212	1.250	230	1.250
141	1.250	159	1.250	177	1.250	195	1.250	213	1.250	231	1.250
142	1.250	160	1.250	178	1.250	196	1.250	214	1.250	232	1.250
143	1.250	161	1.250	179	1.250	197	1.250	215	1.250	233	1.250
144	1.250	162	1.250	180	1.250	198	1.250	216	1.250	234	1.250
145	1.250	163	1.250	181	1.250	199	1.250	217	1.250	235	1.250
146	1.250	164	1.250	182	1.250	200	1.250	218	1.250	236	1.250
147	1.250	165	1.250	183	1.250	201	1.250	219	1.250	237	1.250
148	1.250	166	1.250	184	1.250	202	1.250	220	1.250	238	1.250
149	1.250	167	1.250	185	1.250	203	1.250	221	1.250	239	1.250
150	1.250	168	1.250	186	1.250	204	1.250	222	1.250	240	1.250

Simulation Criteria for OUTFALL 900.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 Storage Structures 0			
Number of Online Controls 0 Number of Time/Area Diagrams 0			
Number of Offline Controls 0 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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /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 Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
2.000	10 15	Winter	1	+0%	1/15 Winter	30/15 Summer		
2.001	11 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
2.002	12 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
2.003	13 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
1.001	2 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
1.002	3 30	Winter	1	+0%	1/15 Summer	100/15 Summer		
1.003	4 30	Winter	1	+0%	1/15 Summer			
1.004	5 30	Winter	1	+0%	1/15 Summer			
3.000	20 15	Winter	1	+0%	100/15 Summer			
4.000	30 15	Summer	1	+0%	30/15 Summer	100/15 Summer		
3.001	21 30	Winter	1	+0%	1/15 Summer			
1.005	6 30	Winter	1	+0%	1/15 Summer			
5.000	40 15	Winter	1	+0%	30/15 Summer	100/15 Winter		
1.006	7 30	Winter	1	+0%	1/15 Summer			

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XP Solutions	Network 2017.1.2	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.SWS

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.017	0.067	0.000	0.28		15.2	SURCHARGED			16
2.000	10	6.884	0.004	0.000	0.83		67.7	SURCHARGED			11
2.001	11	6.742	0.172	0.000	1.08		85.9	SURCHARGED			19
2.002	12	6.410	0.180	0.000	1.11		86.0	SURCHARGED			18
2.003	13	6.134	0.134	0.000	0.85		84.8	SURCHARGED			9
1.001	2	6.008	0.183	0.000	1.38		103.6	SURCHARGED			10
1.002	3	5.788	0.088	0.000	0.96		116.9	SURCHARGED			5
1.003	4	5.695	0.095	0.000	1.03		124.2	SURCHARGED			
1.004	5	5.615	0.090	0.000	0.57		126.7	SURCHARGED			
3.000	20	5.566	-0.534	0.000	0.03		9.6	OK			
4.000	30	5.924	-0.101	0.000	0.51		21.4	OK			4
3.001	21	5.550	0.275	0.000	0.09		26.2	SURCHARGED			
1.005	6	5.546	0.356	0.000	0.89		225.9	SURCHARGED			
5.000	40	5.562	-0.038	0.000	0.43		162.6	OK			1
1.006	7	5.473	0.273	0.000	0.37		349.7	SURCHARGED			

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.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 Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 30	Winter	30	+0%	1/15 Summer	30/15 Summer		
2.000	10 15	Winter	30	+0%	1/15 Winter	30/15 Summer		
2.001	11 30	Winter	30	+0%	1/15 Summer	30/15 Summer		
2.002	12 30	Winter	30	+0%	1/15 Summer	30/15 Summer		
2.003	13 15	Summer	30	+0%	1/15 Summer	30/15 Summer		
1.001	2 15	Winter	30	+0%	1/15 Summer	30/15 Summer		
1.002	3 15	Winter	30	+0%	1/15 Summer	100/15 Summer		
1.003	4 15	Winter	30	+0%	1/15 Summer			
1.004	5 15	Winter	30	+0%	1/15 Summer			
3.000	20 15	Winter	30	+0%	100/15 Summer			
4.000	30 15	Summer	30	+0%	30/15 Summer	100/15 Summer		
3.001	21 15	Winter	30	+0%	1/15 Summer			
1.005	6 15	Winter	30	+0%	1/15 Summer			
5.000	40 15	Winter	30	+0%	30/15 Summer	100/15 Winter		
1.006	7 15	Winter	30	+0%	1/15 Summer			

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)		
1.000	1	6.597	0.647	17.214	0.92	50.2	FLOOD	16
2.000	10	7.988	1.108	8.163	1.46	119.0	FLOOD	11
2.001	11	7.345	0.775	45.258	1.13	89.6	FLOOD	19
2.002	12	6.944	0.714	14.076	1.57	121.8	FLOOD	18
2.003	13	6.760	0.760	0.087	1.20	119.4	FLOOD	9
1.001	2	6.673	0.848	2.919	2.05	153.5	FLOOD	10
1.002	3	6.601	0.901	0.000	1.44	175.1	FLOOD RISK	5
1.003	4	6.404	0.804	0.000	1.66	200.5	SURCHARGED	
1.004	5	6.187	0.662	0.000	0.94	207.9	SURCHARGED	
3.000	20	5.998	-0.102	0.000	0.06	19.5	OK	
4.000	30	6.660	0.635	0.000	0.94	39.2	SURCHARGED	4
3.001	21	5.996	0.721	0.000	0.24	69.3	SURCHARGED	
1.005	6	5.982	0.792	0.000	2.11	535.9	SURCHARGED	
5.000	40	6.122	0.522	0.000	1.13	422.7	SURCHARGED	1
1.006	7	5.559	0.359	0.000	1.00	952.7	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 900.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 Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
2.000	10	15 Winter	100	+30%	1/15 Winter	30/15 Summer		
2.001	11	60 Winter	100	+30%	1/15 Summer	30/15 Summer		
2.002	12	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
2.003	13	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
1.001	2	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
1.002	3	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
1.003	4	15 Winter	100	+30%	1/15 Summer			
1.004	5	15 Winter	100	+30%	1/15 Summer			
3.000	20	15 Winter	100	+30%	100/15 Summer			
4.000	30	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
3.001	21	15 Winter	100	+30%	1/15 Summer			
1.005	6	15 Winter	100	+30%	1/15 Summer			
5.000	40	15 Winter	100	+30%	30/15 Summer	100/15 Winter		
1.006	7	15 Winter	100	+30%	1/15 Summer			


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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for OUTFALL 900.SWS

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.648	0.698	68.889	1.15		62.9	FLOOD			16
2.000	10	8.030	1.150	49.680	1.47		119.4	FLOOD			11
2.001	11	7.424	0.854	123.871	1.15		91.4	FLOOD			19
2.002	12	6.978	0.748	48.284	1.59		123.5	FLOOD			18
2.003	13	6.770	0.770	9.595	1.25		123.5	FLOOD			9
1.001	2	6.716	0.891	46.083	2.16		162.3	FLOOD			10
1.002	3	6.716	1.016	36.228	1.62		197.4	FLOOD			5
1.003	4	6.788	1.188	0.000	1.77		214.1	FLOOD RISK			
1.004	5	6.756	1.231	0.000	0.98		216.4	SURCHARGED			
3.000	20	6.684	0.584	0.000	0.11		39.6	SURCHARGED			
4.000	30	7.305	1.280	5.353	1.12		46.8	FLOOD			4
3.001	21	6.681	1.406	0.000	0.38		111.5	SURCHARGED			
1.005	6	6.658	1.468	0.000	2.93		744.6	SURCHARGED			
5.000	40	7.400	1.800	0.092	1.86		695.8	FLOOD			1
1.006	7	5.856	0.656	0.000	1.49		1424.8	SURCHARGED			

Appendix 7c – Drainage Model Files – Application 1A ‘Half Tide Wharf’ Area


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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	57.667	0.235	245.4	0.115	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	49.237	0.200	246.2	0.109	0.00	0.0	0.013	o	300	Pipe/Conduit
1.002	14.797	0.060	246.6	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.003	34.432	0.138	250.0	0.100	5.00	0.0	0.013	o	300	Pipe/Conduit
2.000	38.985	0.310	125.8	0.322	5.00	0.0	0.013	o	300	Pipe/Conduit
2.001	45.364	0.340	133.4	0.226	0.00	0.0	0.013	o	300	Pipe/Conduit
2.002	31.067	0.230	135.1	0.022	0.00	0.0	0.013	o	300	Pipe/Conduit
2.003	11.855	0.175	67.7	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
3.000	22.765	0.152	149.8	0.148	5.00	0.0	0.013	o	150	Pipe/Conduit
4.000	57.667	0.235	245.4	0.132	5.00	0.0	0.013	o	300	Pipe/Conduit
4.001	44.273	0.180	246.0	0.144	0.00	0.0	0.013	o	300	Pipe/Conduit
4.002	23.769	0.095	250.0	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.004	59.737	0.121	493.7	0.172	0.00	0.0	0.013	o	375	Pipe/Conduit
1.005	46.501	0.104	447.1	0.281	0.00	0.0	0.013	o	450	Pipe/Conduit
1.006	33.647	0.075	448.6	0.122	0.00	0.0	0.013	o	450	Pipe/Conduit
1.007	29.891	0.230	130.0	0.042	0.00	0.0	0.013	o	450	Pipe/Conduit
5.000	4.672	0.100	46.7	0.069	5.00	0.0	0.013	o	525	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	6.150	0.115	0.0	0.87	61.7
1.001	5.915	0.224	0.0	0.87	61.6
1.002	5.715	0.224	0.0	0.87	61.6
1.003	5.655	0.324	0.0	0.87	61.2
2.000	6.580	0.322	0.0	1.22	86.2
2.001	6.270	0.548	0.0	1.18	83.7
2.002	5.930	0.570	0.0	1.18	83.2
2.003	5.700	0.570	0.0	1.66	117.5
3.000	5.600	0.148	0.0	0.70	12.4
4.000	6.000	0.132	0.0	0.87	61.7
4.001	5.765	0.276	0.0	0.87	61.7
4.002	5.585	0.276	0.0	0.87	61.2
1.004	5.450	1.490	0.0	0.71	78.9
1.005	5.254	1.771	0.0	0.85	134.8
1.006	5.150	1.893	0.0	0.85	134.6
1.007	5.075	1.935	0.0	1.57	250.1
5.000	5.500	0.069	0.0	2.91	629.2


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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
6.000	89.092	0.800	111.4	0.131	2.00	0.0	0.013	o	225	Pipe/Conduit
5.001	21.172	0.075	282.3	0.059	0.00	0.0	0.013	o	600	Pipe/Conduit
1.008	40.384	0.090	448.7	1.044	0.00	0.0	0.013	o	600	Pipe/Conduit
7.000	95.909	0.250	383.6	1.366	5.00	0.0	0.013	o	600	Pipe/Conduit
1.009	12.545	0.100	125.5	0.000	0.00	0.0	0.013	o	900	Pipe/Conduit


Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
6.000	5.800	0.131	0.0	1.07	42.5
5.001	4.675	0.259	0.0	1.29	365.4
1.008	4.590	3.238	0.0	1.03	289.9
7.000	5.000	1.366	0.0	1.11	313.5
1.009	4.300	4.604	0.0	2.54	1616.3

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Manhole Schedules for OUTFALL 900.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	7.200	1.050	Open Manhole	1200	1.000	6.150	300				
2	7.200	1.285	Open Manhole	1200	1.001	5.915	300	1.000	5.915	300	
3	7.200	1.485	Open Manhole	1200	1.002	5.715	300	1.001	5.715	300	
1	6.750	1.095	Open Manhole	1200	1.003	5.655	300	1.002	5.655	300	
10	7.980	1.400	Open Manhole	1200	2.000	6.580	300				
11	7.300	1.030	Open Manhole	1200	2.001	6.270	300	2.000	6.270	300	
12	6.930	1.000	Open Manhole	1200	2.002	5.930	300	2.001	5.930	300	
13	6.760	1.060	Open Manhole	1200	2.003	5.700	300	2.002	5.700	300	
6	7.300	1.700	Open Manhole	1200	3.000	5.600	150				
7	7.200	1.200	Open Manhole	1200	4.000	6.000	300				
8	7.200	1.435	Open Manhole	1200	4.001	5.765	300	4.000	5.765	300	
9	7.200	1.615	Open Manhole	1200	4.002	5.585	300	4.001	5.585	300	
7	6.670	1.222	Open Manhole	1350	1.004	5.450	375	1.003	5.517	300	
								2.003	5.525	300	
								3.000	5.448	150	
								4.002	5.490	300	
8	6.680	1.426	Open Manhole	1350	1.005	5.254	450	1.004	5.329	375	
9	6.800	1.650	Open Manhole	1350	1.006	5.150	450	1.005	5.150	450	
10	7.100	2.025	Open Manhole	1350	1.007	5.075	450	1.006	5.075	450	
11	7.300	1.800	Open Manhole	1500	5.000	5.500	525				
12	7.300	1.500	Open Manhole	1200	6.000	5.800	225				
13	7.460	2.785	Open Manhole	1500	5.001	4.675	600	5.000	5.400	525	650
								6.000	5.000	225	
14	7.370	2.780	Open Manhole	1500	1.008	4.590	600	1.007	4.845	450	105
								5.001	4.600	600	10
15	7.400	2.400	Open Manhole	1500	7.000	5.000	600				
16	7.400	3.100	Open Manhole	2100	1.009	4.300	900	1.008	4.500	600	
								7.000	4.750	600	150
8	7.300	3.100	Open Manhole	0		OUTFALL		1.009	4.200	900	

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PIPELINE SCHEDULES for OUTFALL 900.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	7.200	6.150	0.750	Open Manhole	1200
1.001	o	300	2	7.200	5.915	0.985	Open Manhole	1200
1.002	o	300	3	7.200	5.715	1.185	Open Manhole	1200
1.003	o	300	1	6.750	5.655	0.795	Open Manhole	1200
2.000	o	300	10	7.980	6.580	1.100	Open Manhole	1200
2.001	o	300	11	7.300	6.270	0.730	Open Manhole	1200
2.002	o	300	12	6.930	5.930	0.700	Open Manhole	1200
2.003	o	300	13	6.760	5.700	0.760	Open Manhole	1200
3.000	o	150	6	7.300	5.600	1.550	Open Manhole	1200
4.000	o	300	7	7.200	6.000	0.900	Open Manhole	1200
4.001	o	300	8	7.200	5.765	1.135	Open Manhole	1200
4.002	o	300	9	7.200	5.585	1.315	Open Manhole	1200
1.004	o	375	7	6.670	5.450	0.845	Open Manhole	1350
1.005	o	450	8	6.680	5.254	0.976	Open Manhole	1350
1.006	o	450	9	6.800	5.150	1.200	Open Manhole	1350
1.007	o	450	10	7.100	5.075	1.575	Open Manhole	1350

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	57.667	245.4	2	7.200	5.915	0.985	Open Manhole	1200
1.001	49.237	246.2	3	7.200	5.715	1.185	Open Manhole	1200
1.002	14.797	246.6	1	6.750	5.655	0.795	Open Manhole	1200
1.003	34.432	250.0	7	6.670	5.517	0.853	Open Manhole	1350
2.000	38.985	125.8	11	7.300	6.270	0.730	Open Manhole	1200
2.001	45.364	133.4	12	6.930	5.930	0.700	Open Manhole	1200
2.002	31.067	135.1	13	6.760	5.700	0.760	Open Manhole	1200
2.003	11.855	67.7	7	6.670	5.525	0.845	Open Manhole	1350
3.000	22.765	149.8	7	6.670	5.448	1.072	Open Manhole	1350
4.000	57.667	245.4	8	7.200	5.765	1.135	Open Manhole	1200
4.001	44.273	246.0	9	7.200	5.585	1.315	Open Manhole	1200
4.002	23.769	250.0	7	6.670	5.490	0.880	Open Manhole	1350
1.004	59.737	493.7	8	6.680	5.329	0.976	Open Manhole	1350
1.005	46.501	447.1	9	6.800	5.150	1.200	Open Manhole	1350
1.006	33.647	448.6	10	7.100	5.075	1.575	Open Manhole	1350
1.007	29.891	130.0	14	7.370	4.845	2.075	Open Manhole	1500

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PIPELINE SCHEDULES for OUTFALL 900.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)
5.000	o	525	11	7.300	5.500	1.275	Open Manhole	1500
6.000	o	225	12	7.300	5.800	1.275	Open Manhole	1200
5.001	o	600	13	7.460	4.675	2.185	Open Manhole	1500
1.008	o	600	14	7.370	4.590	2.180	Open Manhole	1500
7.000	o	600	15	7.400	5.000	1.800	Open Manhole	1500
1.009	o	900	16	7.400	4.300	2.200	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)
5.000	4.672	46.7	13	7.460	5.400	1.535	Open Manhole	1500
6.000	89.092	111.4	13	7.460	5.000	2.235	Open Manhole	1500
5.001	21.172	282.3	14	7.370	4.600	2.170	Open Manhole	1500
1.008	40.384	448.7	16	7.400	4.500	2.300	Open Manhole	2100
7.000	95.909	383.6	16	7.400	4.750	2.050	Open Manhole	2100
1.009	12.545	125.5	8	7.300	4.200	2.200	Open Manhole	0


Surcharged Outfall Details for OUTFALL 900.SWS


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.009	8	7.300	4.200	4.200	0	0
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Datum (m) 4.200 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.250	5	1.250	9	1.250	13	1.250	17	1.250	21	1.250
2	1.250	6	1.250	10	1.250	14	1.250	18	1.250	22	1.250
3	1.250	7	1.250	11	1.250	15	1.250	19	1.250	23	1.250
4	1.250	8	1.250	12	1.250	16	1.250	20	1.250	24	1.250


Enzygo Ltd				Page 5																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...			Monarchs Quay Phase 1A Surface																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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<p style="text-align: center;"><u>Surcharged Outfall Details for OUTFALL 900.SWS</u></p> <table><thead><tr><th>Time (mins)</th><th>Depth (m)</th><th>Time (mins)</th><th>Depth (m)</th><th>Time (mins)</th><th>Depth (m)</th><th>Time (mins)</th><th>Depth (m)</th><th>Time (mins)</th><th>Depth (m)</th><th>Time (mins)</th><th>Depth (m)</th></tr></thead><tbody><tr><td>25</td><td>1.250</td><td>61</td><td>1.250</td><td>97</td><td>1.250</td><td>133</td><td>1.250</td><td>169</td><td>1.250</td><td>205</td><td>1.250</td></tr><tr><td>26</td><td>1.250</td><td>62</td><td>1.250</td><td>98</td><td>1.250</td><td>134</td><td>1.250</td><td>170</td><td>1.250</td><td>206</td><td>1.250</td></tr><tr><td>27</td><td>1.250</td><td>63</td><td>1.250</td><td>99</td><td>1.250</td><td>135</td><td>1.250</td><td>171</td><td>1.250</td><td>207</td><td>1.250</td></tr><tr><td>28</td><td>1.250</td><td>64</td><td>1.250</td><td>100</td><td>1.250</td><td>136</td><td>1.250</td><td>172</td><td>1.250</td><td>208</td><td>1.250</td></tr><tr><td>29</td><td>1.250</td><td>65</td><td>1.250</td><td>101</td><td>1.250</td><td>137</td><td>1.250</td><td>173</td><td>1.250</td><td>209</td><td>1.250</td></tr><tr><td>30</td><td>1.250</td><td>66</td><td>1.250</td><td>102</td><td>1.250</td><td>138</td><td>1.250</td><td>174</td><td>1.250</td><td>210</td><td>1.250</td></tr><tr><td>31</td><td>1.250</td><td>67</td><td>1.250</td><td>103</td><td>1.250</td><td>139</td><td>1.250</td><td>175</td><td>1.250</td><td>211</td><td>1.250</td></tr><tr><td>32</td><td>1.250</td><td>68</td><td>1.250</td><td>104</td><td>1.250</td><td>140</td><td>1.250</td><td>176</td><td>1.250</td><td>212</td><td>1.250</td></tr><tr><td>33</td><td>1.250</td><td>69</td><td>1.250</td><td>105</td><td>1.250</td><td>141</td><td>1.250</td><td>177</td><td>1.250</td><td>213</td><td>1.250</td></tr><tr><td>34</td><td>1.250</td><td>70</td><td>1.250</td><td>106</td><td>1.250</td><td>142</td><td>1.250</td><td>178</td><td>1.250</td><td>214</td><td>1.250</td></tr><tr><td>35</td><td>1.250</td><td>71</td><td>1.250</td><td>107</td><td>1.250</td><td>143</td><td>1.250</td><td>179</td><td>1.250</td><td>215</td><td>1.250</td></tr><tr><td>36</td><td>1.250</td><td>72</td><td>1.250</td><td>108</td><td>1.250</td><td>144</td><td>1.250</td><td>180</td><td>1.250</td><td>216</td><td>1.250</td></tr><tr><td>37</td><td>1.250</td><td>73</td><td>1.250</td><td>109</td><td>1.250</td><td>145</td><td>1.250</td><td>181</td><td>1.250</td><td>217</td><td>1.250</td></tr><tr><td>38</td><td>1.250</td><td>74</td><td>1.250</td><td>110</td><td>1.250</td><td>146</td><td>1.250</td><td>182</td><td>1.250</td><td>218</td><td>1.250</td></tr><tr><td>39</td><td>1.250</td><td>75</td><td>1.250</td><td>111</td><td>1.250</td><td>147</td><td>1.250</td><td>183</td><td>1.250</td><td>219</td><td>1.250</td></tr><tr><td>40</td><td>1.250</td><td>76</td><td>1.250</td><td>112</td><td>1.250</td><td>148</td><td>1.250</td><td>184</td><td>1.250</td><td>220</td><td>1.250</td></tr><tr><td>41</td><td>1.250</td><td>77</td><td>1.250</td><td>113</td><td>1.250</td><td>149</td><td>1.250</td><td>185</td><td>1.250</td><td>221</td><td>1.250</td></tr><tr><td>42</td><td>1.250</td><td>78</td><td>1.250</td><td>114</td><td>1.250</td><td>150</td><td>1.250</td><td>186</td><td>1.250</td><td>222</td><td>1.250</td></tr><tr><td>43</td><td>1.250</td><td>79</td><td>1.250</td><td>115</td><td>1.250</td><td>151</td><td>1.250</td><td>187</td><td>1.250</td><td>223</td><td>1.250</td></tr><tr><td>44</td><td>1.250</td><td>80</td><td>1.250</td><td>116</td><td>1.250</td><td>152</td><td>1.250</td><td>188</td><td>1.250</td><td>224</td><td>1.250</td></tr><tr><td>45</td><td>1.250</td><td>81</td><td>1.250</td><td>117</td><td>1.250</td><td>153</td><td>1.250</td><td>189</td><td>1.250</td><td>225</td><td>1.250</td></tr><tr><td>46</td><td>1.250</td><td>82</td><td>1.250</td><td>118</td><td>1.250</td><td>154</td><td>1.250</td><td>190</td><td>1.250</td><td>226</td><td>1.250</td></tr><tr><td>47</td><td>1.250</td><td>83</td><td>1.250</td><td>119</td><td>1.250</td><td>155</td><td>1.250</td><td>191</td><td>1.250</td><td>227</td><td>1.250</td></tr><tr><td>48</td><td>1.250</td><td>84</td><td>1.250</td><td>120</td><td>1.250</td><td>156</td><td>1.250</td><td>192</td><td>1.250</td><td>228</td><td>1.250</td></tr><tr><td>49</td><td>1.250</td><td>85</td><td>1.250</td><td>121</td><td>1.250</td><td>157</td><td>1.250</td><td>193</td><td>1.250</td><td>229</td><td>1.250</td></tr><tr><td>50</td><td>1.250</td><td>86</td><td>1.250</td><td>122</td><td>1.250</td><td>158</td><td>1.250</td><td>194</td><td>1.250</td><td>230</td><td>1.250</td></tr><tr><td>51</td><td>1.250</td><td>87</td><td>1.250</td><td>123</td><td>1.250</td><td>159</td><td>1.250</td><td>195</td><td>1.250</td><td>231</td><td>1.250</td></tr><tr><td>52</td><td>1.250</td><td>88</td><td>1.250</td><td>124</td><td>1.250</td><td>160</td><td>1.250</td><td>196</td><td>1.250</td><td>232</td><td>1.250</td></tr><tr><td>53</td><td>1.250</td><td>89</td><td>1.250</td><td>125</td><td>1.250</td><td>161</td><td>1.250</td><td>197</td><td>1.250</td><td>233</td><td>1.250</td></tr><tr><td>54</td><td>1.250</td><td>90</td><td>1.250</td><td>126</td><td>1.250</td><td>162</td><td>1.250</td><td>198</td><td>1.250</td><td>234</td><td>1.250</td></tr><tr><td>55</td><td>1.250</td><td>91</td><td>1.250</td><td>127</td><td>1.250</td><td>163</td><td>1.250</td><td>199</td><td>1.250</td><td>235</td><td>1.250</td></tr><tr><td>56</td><td>1.250</td><td>92</td><td>1.250</td><td>128</td><td>1.250</td><td>164</td><td>1.250</td><td>200</td><td>1.250</td><td>236</td><td>1.250</td></tr><tr><td>57</td><td>1.250</td><td>93</td><td>1.250</td><td>129</td><td>1.250</td><td>165</td><td>1.250</td><td>201</td><td>1.250</td><td>237</td><td>1.250</td></tr><tr><td>58</td><td>1.250</td><td>94</td><td>1.250</td><td>130</td><td>1.250</td><td>166</td><td>1.250</td><td>202</td><td>1.250</td><td>238</td><td>1.250</td></tr><tr><td>59</td><td>1.250</td><td>95</td><td>1.250</td><td>131</td><td>1.250</td><td>167</td><td>1.250</td><td>203</td><td>1.250</td><td>239</td><td>1.250</td></tr><tr><td>60</td><td>1.250</td><td>96</td><td>1.250</td><td>132</td><td>1.250</td><td>168</td><td>1.250</td><td>204</td><td>1.250</td><td>240</td><td>1.250</td></tr></tbody></table>							Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	25	1.250	61	1.250	97	1.250	133	1.250	169	1.250	205	1.250	26	1.250	62	1.250	98	1.250	134	1.250	170	1.250	206	1.250	27	1.250	63	1.250	99	1.250	135	1.250	171	1.250	207	1.250	28	1.250	64	1.250	100	1.250	136	1.250	172	1.250	208	1.250	29	1.250	65	1.250	101	1.250	137	1.250	173	1.250	209	1.250	30	1.250	66	1.250	102	1.250	138	1.250	174	1.250	210	1.250	31	1.250	67	1.250	103	1.250	139	1.250	175	1.250	211	1.250	32	1.250	68	1.250	104	1.250	140	1.250	176	1.250	212	1.250	33	1.250	69	1.250	105	1.250	141	1.250	177	1.250	213	1.250	34	1.250	70	1.250	106	1.250	142	1.250	178	1.250	214	1.250	35	1.250	71	1.250	107	1.250	143	1.250	179	1.250	215	1.250	36	1.250	72	1.250	108	1.250	144	1.250	180	1.250	216	1.250	37	1.250	73	1.250	109	1.250	145	1.250	181	1.250	217	1.250	38	1.250	74	1.250	110	1.250	146	1.250	182	1.250	218	1.250	39	1.250	75	1.250	111	1.250	147	1.250	183	1.250	219	1.250	40	1.250	76	1.250	112	1.250	148	1.250	184	1.250	220	1.250	41	1.250	77	1.250	113	1.250	149	1.250	185	1.250	221	1.250	42	1.250	78	1.250	114	1.250	150	1.250	186	1.250	222	1.250	43	1.250	79	1.250	115	1.250	151	1.250	187	1.250	223	1.250	44	1.250	80	1.250	116	1.250	152	1.250	188	1.250	224	1.250	45	1.250	81	1.250	117	1.250	153	1.250	189	1.250	225	1.250	46	1.250	82	1.250	118	1.250	154	1.250	190	1.250	226	1.250	47	1.250	83	1.250	119	1.250	155	1.250	191	1.250	227	1.250	48	1.250	84	1.250	120	1.250	156	1.250	192	1.250	228	1.250	49	1.250	85	1.250	121	1.250	157	1.250	193	1.250	229	1.250	50	1.250	86	1.250	122	1.250	158	1.250	194	1.250	230	1.250	51	1.250	87	1.250	123	1.250	159	1.250	195	1.250	231	1.250	52	1.250	88	1.250	124	1.250	160	1.250	196	1.250	232	1.250	53	1.250	89	1.250	125	1.250	161	1.250	197	1.250	233	1.250	54	1.250	90	1.250	126	1.250	162	1.250	198	1.250	234	1.250	55	1.250	91	1.250	127	1.250	163	1.250	199	1.250	235	1.250	56	1.250	92	1.250	128	1.250	164	1.250	200	1.250	236	1.250	57	1.250	93	1.250	129	1.250	165	1.250	201	1.250	237	1.250	58	1.250	94	1.250	130	1.250	166	1.250	202	1.250	238	1.250	59	1.250	95	1.250	131	1.250	167	1.250	203	1.250	239	1.250	60	1.250	96	1.250	132	1.250	168	1.250	204	1.250	240	1.250
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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26	1.250	62	1.250	98	1.250	134	1.250	170	1.250	206	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
27	1.250	63	1.250	99	1.250	135	1.250	171	1.250	207	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
28	1.250	64	1.250	100	1.250	136	1.250	172	1.250	208	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
29	1.250	65	1.250	101	1.250	137	1.250	173	1.250	209	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
30	1.250	66	1.250	102	1.250	138	1.250	174	1.250	210	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
31	1.250	67	1.250	103	1.250	139	1.250	175	1.250	211	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
32	1.250	68	1.250	104	1.250	140	1.250	176	1.250	212	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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35	1.250	71	1.250	107	1.250	143	1.250	179	1.250	215	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
36	1.250	72	1.250	108	1.250	144	1.250	180	1.250	216	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
37	1.250	73	1.250	109	1.250	145	1.250	181	1.250	217	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
38	1.250	74	1.250	110	1.250	146	1.250	182	1.250	218	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
39	1.250	75	1.250	111	1.250	147	1.250	183	1.250	219	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
40	1.250	76	1.250	112	1.250	148	1.250	184	1.250	220	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
41	1.250	77	1.250	113	1.250	149	1.250	185	1.250	221	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
42	1.250	78	1.250	114	1.250	150	1.250	186	1.250	222	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
43	1.250	79	1.250	115	1.250	151	1.250	187	1.250	223	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
44	1.250	80	1.250	116	1.250	152	1.250	188	1.250	224	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
45	1.250	81	1.250	117	1.250	153	1.250	189	1.250	225	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
46	1.250	82	1.250	118	1.250	154	1.250	190	1.250	226	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
47	1.250	83	1.250	119	1.250	155	1.250	191	1.250	227	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
48	1.250	84	1.250	120	1.250	156	1.250	192	1.250	228	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
49	1.250	85	1.250	121	1.250	157	1.250	193	1.250	229	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
50	1.250	86	1.250	122	1.250	158	1.250	194	1.250	230	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
51	1.250	87	1.250	123	1.250	159	1.250	195	1.250	231	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
52	1.250	88	1.250	124	1.250	160	1.250	196	1.250	232	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
53	1.250	89	1.250	125	1.250	161	1.250	197	1.250	233	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
54	1.250	90	1.250	126	1.250	162	1.250	198	1.250	234	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
55	1.250	91	1.250	127	1.250	163	1.250	199	1.250	235	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
56	1.250	92	1.250	128	1.250	164	1.250	200	1.250	236	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
57	1.250	93	1.250	129	1.250	165	1.250	201	1.250	237	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
58	1.250	94	1.250	130	1.250	166	1.250	202	1.250	238	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
59	1.250	95	1.250	131	1.250	167	1.250	203	1.250	239	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
60	1.250	96	1.250	132	1.250	168	1.250	204	1.250	240	1.250																																																																																																																																																																																																																																																																																																																																																																																																																																																							
<p style="text-align: center;"><u>Simulation Criteria for OUTFALL 900.SWS</u></p> <table><tr><td>Volumetric Runoff Coeff</td><td>0.750</td><td>Additional Flow - % of Total Flow</td><td>0.000</td></tr><tr><td>Areal Reduction Factor</td><td>1.000</td><td>MADD Factor * 10m³/ha Storage</td><td>2.000</td></tr><tr><td>Hot Start (mins)</td><td>0</td><td>Inlet Coefficient</td><td>0.800</td></tr><tr><td>Hot Start Level (mm)</td><td>0</td><td>Flow per Person per Day (l/per/day)</td><td>0.000</td></tr><tr><td>Manhole Headloss Coeff (Global)</td><td>0.500</td><td>Run Time (mins)</td><td>60</td></tr><tr><td>Foul Sewage per hectare (l/s)</td><td>0.000</td><td>Output Interval (mins)</td><td>1</td></tr><tr><td>Number of Input Hydrographs</td><td>0</td><td>Number of Storage Structures</td><td>4</td></tr><tr><td>Number of Online Controls</td><td>0</td><td>Number of Time/Area Diagrams</td><td>0</td></tr><tr><td>Number of Offline Controls</td><td>0</td><td>Number of Real Time Controls</td><td>0</td></tr></table>							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 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 Storage Structures	4	Number of Online Controls	0	Number of Time/Area Diagrams	0	Number of Offline Controls	0	Number of Real Time Controls	0																																																																																																																																																																																																																																																																																																																																																																																																																								
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Simulation Criteria for OUTFALL 900.SWS

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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Storage Structures for OUTFALL 900.SWS

Cellular Storage Manhole: 2, DS/PN: 1.001

Invert Level (m) 5.915 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
 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)
0.000	178.0	178.0	1.300	0.0	207.4
0.100	178.0	183.3	1.400	0.0	207.4
0.200	178.0	188.7	1.500	0.0	207.4
0.300	178.0	194.0	1.600	0.0	207.4
0.400	178.0	199.3	1.700	0.0	207.4
0.500	178.0	204.7	1.800	0.0	207.4
0.600	0.0	207.4	1.900	0.0	207.4
0.700	0.0	207.4	2.000	0.0	207.4
0.800	0.0	207.4	2.100	0.0	207.4
0.900	0.0	207.4	2.200	0.0	207.4
1.000	0.0	207.4	2.300	0.0	207.4
1.100	0.0	207.4	2.400	0.0	207.4
1.200	0.0	207.4	2.500	0.0	207.4


Cellular Storage Manhole: 1, DS/PN: 1.003

Invert Level (m) 5.560 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
 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)
0.000	160.0	267.0	1.300	0.0	302.9
0.100	160.0	273.5	1.400	0.0	302.9
0.200	160.0	280.1	1.500	0.0	302.9
0.300	160.0	286.6	1.600	0.0	302.9
0.400	160.0	293.1	1.700	0.0	302.9
0.500	160.0	299.7	1.800	0.0	302.9
0.600	0.0	302.9	1.900	0.0	302.9
0.700	0.0	302.9	2.000	0.0	302.9
0.800	0.0	302.9	2.100	0.0	302.9
0.900	0.0	302.9	2.200	0.0	302.9
1.000	0.0	302.9	2.300	0.0	302.9
1.100	0.0	302.9	2.400	0.0	302.9
1.200	0.0	302.9	2.500	0.0	302.9

Cellular Storage Manhole: 6, DS/PN: 3.000

Invert Level (m) 5.600 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: 6, DS/PN: 3.000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	200.0	200.0	1.300	0.0	231.1
0.100	200.0	205.7	1.400	0.0	231.1
0.200	200.0	211.3	1.500	0.0	231.1
0.300	200.0	217.0	1.600	0.0	231.1
0.400	200.0	222.6	1.700	0.0	231.1
0.500	200.0	228.3	1.800	0.0	231.1
0.600	0.0	231.1	1.900	0.0	231.1
0.700	0.0	231.1	2.000	0.0	231.1
0.800	0.0	231.1	2.100	0.0	231.1
0.900	0.0	231.1	2.200	0.0	231.1
1.000	0.0	231.1	2.300	0.0	231.1
1.100	0.0	231.1	2.400	0.0	231.1
1.200	0.0	231.1	2.500	0.0	231.1

Cellular Storage Manhole: 8, DS/PN: 4.001

Invert Level (m) 5.765 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
 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)
0.000	160.0	160.0	1.300	0.0	187.8
0.100	160.0	165.1	1.400	0.0	187.8
0.200	160.0	170.1	1.500	0.0	187.8
0.300	160.0	175.2	1.600	0.0	187.8
0.400	160.0	180.2	1.700	0.0	187.8
0.500	160.0	185.3	1.800	0.0	187.8
0.600	0.0	187.8	1.900	0.0	187.8
0.700	0.0	187.8	2.000	0.0	187.8
0.800	0.0	187.8	2.100	0.0	187.8
0.900	0.0	187.8	2.200	0.0	187.8
1.000	0.0	187.8	2.300	0.0	187.8
1.100	0.0	187.8	2.400	0.0	187.8
1.200	0.0	187.8	2.500	0.0	187.8

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.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 Storage Structures	4
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	15 Winter	1	+0%	100/15 Summer			
1.001	2	60 Winter	1	+0%	100/30 Summer			
1.002	3	60 Winter	1	+0%	100/15 Summer			
1.003	1	240 Winter	1	+0%	30/30 Winter			
2.000	10	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
2.001	11	15 Winter	1	+0%	30/15 Summer	30/15 Summer		
2.002	12	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
2.003	13	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
3.000	6	60 Winter	1	+0%	30/15 Summer			
4.000	7	15 Winter	1	+0%	100/15 Summer			
4.001	8	30 Winter	1	+0%	100/15 Summer			
4.002	9	15 Winter	1	+0%	30/15 Summer			
1.004	7	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.005	8	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.006	9	30 Winter	1	+0%	1/15 Winter			
1.007	10	30 Winter	1	+0%	1/15 Summer			
5.000	11	15 Winter	1	+0%	100/15 Summer			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS


PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.256	-0.194	0.000	0.26		15.7		OK		
1.001	2	5.990	-0.225	0.000	0.14		8.5		OK		
1.002	3	5.794	-0.221	0.000	0.16		8.5		OK		
1.003	1	5.719	-0.236	0.000	0.10		5.8		OK		
2.000	10	6.740	-0.140	0.000	0.54		44.0		OK		4
2.001	11	6.488	-0.082	0.000	0.86		68.5		OK		11
2.002	12	6.153	-0.077	0.000	0.90		69.5		OK		5
2.003	13	5.888	-0.112	0.000	0.71		70.1		OK		2
3.000	6	5.675	-0.075	0.000	0.48		5.7		OK		
4.000	7	6.115	-0.185	0.000	0.30		17.7		OK		
4.001	8	5.857	-0.208	0.000	0.21		12.1		OK		
4.002	9	5.786	-0.099	0.000	0.25		13.8		OK		
1.004	7	5.777	-0.048	0.000	0.95		71.4		OK		1
1.005	8	5.669	-0.035	0.000	0.71		88.2		OK		4
1.006	9	5.618	0.018	0.000	0.78		94.3	SURCHARGED			
1.007	10	5.572	0.047	0.000	0.44		97.4	SURCHARGED			
5.000	11	5.567	-0.458	0.000	0.04		9.6		OK		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

										Water		
	US/MH			Return	Climate	First (X)		First (Y)		First (Z)	Overflow	Level
PN	Name	Storm	Period	Change	Surcharge	Flood		Overflow		Act.		(m)
6.000	12	15	Summer	1	+0%	30/15	Summer	100/15	Summer			5.924
5.001	13	30	Winter	1	+0%	1/15	Summer					5.533
1.008	14	30	Winter	1	+0%	1/15	Summer					5.528
7.000	15	15	Winter	1	+0%	30/15	Summer					5.561
1.009	16	30	Winter	1	+0%	1/15	Summer					5.471

		Surcharged Flooded				Pipe		
US/MH	Depth	Volume	Flow /	Overflow	Pipe	Level		
PN	Name	(m)	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded
6.000	12	-0.101	0.000	0.51		21.4	OK	4
5.001	13	0.258	0.000	0.09		26.3	SURCHARGED	
1.008	14	0.338	0.000	0.78		199.0	SURCHARGED	
7.000	15	-0.039	0.000	0.54		158.5	OK	
1.009	16	0.271	0.000	0.34		325.5	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.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 Storage Structures	4
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 15	Winter	30	+0%	100/15	Summer		
1.001	2 30	Winter	30	+0%	100/30	Summer		
1.002	3 30	Winter	30	+0%	100/15	Summer		
1.003	1 30	Winter	30	+0%	30/30	Winter		
2.000	10 15	Winter	30	+0%	30/15	Summer	100/15	Summer
2.001	11 15	Winter	30	+0%	30/15	Summer	30/15	Summer
2.002	12 15	Winter	30	+0%	30/15	Summer	100/15	Summer
2.003	13 15	Winter	30	+0%	30/15	Summer	100/15	Summer
3.000	6 60	Winter	30	+0%	30/15	Summer		
4.000	7 15	Winter	30	+0%	100/15	Summer		
4.001	8 30	Winter	30	+0%	100/15	Summer		
4.002	9 15	Winter	30	+0%	30/15	Summer		
1.004	7 15	Winter	30	+0%	30/15	Summer	100/15	Summer
1.005	8 15	Winter	30	+0%	30/15	Summer	100/15	Summer
1.006	9 15	Winter	30	+0%	1/15	Winter		
1.007	10 15	Winter	30	+0%	1/15	Summer		
5.000	11 15	Winter	30	+0%	100/15	Summer		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.330	-0.120	0.000	0.63		37.2			OK	
1.001	2	6.064	-0.151	0.000	0.49		28.8			OK	
1.002	3	6.014	-0.001	0.000	0.45		24.3			OK	
1.003	1	5.996	0.041	0.000	0.80		45.9			SURCHARGED	
2.000	10	7.749	0.869	0.000	1.14		92.9			FLOOD RISK	4
2.001	11	7.309	0.739	8.840	1.38		109.5			FLOOD	11
2.002	12	6.848	0.618	0.000	1.43		110.8			FLOOD RISK	5
2.003	13	6.456	0.456	0.000	1.12		111.1			SURCHARGED	2
3.000	6	5.885	0.135	0.000	1.11		13.3			SURCHARGED	
4.000	7	6.198	-0.102	0.000	0.72		42.6			OK	
4.001	8	6.064	-0.001	0.000	0.65		38.0			OK	
4.002	9	6.175	0.290	0.000	0.72		40.2			SURCHARGED	
1.004	7	6.268	0.443	0.000	1.38		103.2			SURCHARGED	1
1.005	8	6.255	0.551	0.000	0.98		122.4			SURCHARGED	4
1.006	9	6.164	0.564	0.000	1.25		151.3			SURCHARGED	
1.007	10	6.038	0.513	0.000	0.73		162.3			SURCHARGED	
5.000	11	5.929	-0.096	0.000	0.08		20.1			OK	


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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS


										Water		
	US/MH			Return	Climate	First (X)		First (Y)		First (Z)	Overflow	Level
PN	Name	Storm	Period	Change	Surcharge	Flood		Overflow		Act.		(m)
6.000	12	15	Summer	30	+0%	30/15	Summer	100/15	Summer			6.645
5.001	13	15	Winter	30	+0%	1/15	Summer					5.927
1.008	14	15	Winter	30	+0%	1/15	Summer					5.912
7.000	15	15	Winter	30	+0%	30/15	Summer					6.115
1.009	16	15	Winter	30	+0%	1/15	Summer					5.534

Surcharged Flooded				Pipe		Level	
US/MH	Depth	Volume	Flow /	Flow			
PN	Name	(m)	(m³)	Cap.	(l/s)	(l/s)	Exceeded
6.000	12	0.620	0.000	0.94		39.5	4
5.001	13	0.652	0.000	0.25		72.4	
1.008	14	0.722	0.000	1.97		501.2	
7.000	15	0.515	0.000	1.40		414.3	
1.009	16	0.334	0.000	0.95		912.7	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for OUTFALL 900.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)		(l/s)	Flow (l/s)		
1.000	1	6.491	0.041	0.000	1.04		61.7	SURCHARGED	
1.001	2	6.398	0.183	0.000	0.77		45.0	SURCHARGED	
1.002	3	6.523	0.508	0.000	0.70		37.3	SURCHARGED	
1.003	1	6.580	0.625	0.000	0.91		52.3	FLOOD RISK	
2.000	10	7.991	1.111	11.504	1.46		118.7	FLOOD	4
2.001	11	7.360	0.790	60.045	1.27		101.4	FLOOD	11
2.002	12	6.936	0.706	5.752	1.49		115.5	FLOOD	5
2.003	13	6.760	0.760	0.111	1.17		116.4	FLOOD	2
3.000	6	6.287	0.537	0.000	1.38		16.4	SURCHARGED	
4.000	7	6.926	0.626	0.000	0.92		54.3	FLOOD RISK	
4.001	8	6.875	0.810	0.000	0.97		56.7	SURCHARGED	
4.002	9	6.698	0.813	0.000	1.02		57.1	SURCHARGED	
1.004	7	6.670	0.845	0.091	1.76		132.1	FLOOD	1
1.005	8	6.704	1.000	24.512	1.06		131.8	FLOOD	4
1.006	9	6.776	1.176	0.000	1.33		160.4	FLOOD RISK	
1.007	10	6.733	1.208	0.000	0.80		178.3	SURCHARGED	
5.000	11	6.642	0.617	0.000	0.16		39.4	SURCHARGED	


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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 900.SWS

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level (m)
6.000	12	15 Winter	100	+30%	30/15 Summer	100/15 Summer			7.305
5.001	13	15 Winter	100	+30%	1/15 Summer				6.638
1.008	14	15 Winter	100	+30%	1/15 Summer				6.616
7.000	15	15 Winter	100	+30%	30/15 Summer				7.383
1.009	16	15 Winter	100	+30%	1/15 Summer				5.841

	US/MH	Depth	Volume	Flow /	Overflow	Pipe		Level
PN	Name	(m)	(m³)	Cap.	(l/s)	Flow (l/s)	Status	Exceeded
6.000	12	1.280	5.063	1.12		46.9	FLOOD	4
5.001	13	1.363	0.000	0.38		111.1	SURCHARGED	
1.008	14	1.426	0.000	2.89		734.9	SURCHARGED	
7.000	15	1.783	0.000	2.28		675.2	FLOOD RISK	
1.009	16	0.641	0.000	1.47		1404.2	SURCHARGED	

Appendix 7d – Drainage Model Files – Application 1B ‘Arena’ Area


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	51.319	0.200	256.6	0.213	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	54.917	0.260	211.2	0.169	0.00	0.0	0.013	o	450	Pipe/Conduit
2.000	42.272	1.800	23.5	0.098	5.00	0.0	0.013	o	225	Pipe/Conduit
2.001	21.880	0.547	40.0	0.015	0.00	0.0	0.013	o	225	Pipe/Conduit
1.002	90.086	0.210	429.0	0.446	0.00	0.0	0.013	o	525	Pipe/Conduit
1.003	75.701	0.160	473.1	0.262	0.00	0.0	0.013	o	525	Pipe/Conduit
1.004	55.589	0.125	444.7	0.151	0.00	0.0	0.013	o	525	Pipe/Conduit
3.000	56.476	0.540	104.6	0.158	5.00	0.0	0.013	o	300	Pipe/Conduit
4.000	42.000	0.210	200.0	0.158	5.00	0.0	0.013	o	300	Pipe/Conduit
4.001	10.000	0.100	100.0	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
4.002	61.000	0.540	113.0	0.252	5.00	0.0	0.013	o	300	Pipe/Conduit
1.005	59.467	0.105	566.4	0.225	0.00	0.0	0.013	o	525	Pipe/Conduit
5.000	45.627	0.570	80.0	0.377	5.00	0.0	0.013	o	300	Pipe/Conduit
1.006	50.475	0.200	252.4	0.063	0.00	0.0	0.013	o	600	Pipe/Conduit
1.007	22.365	0.050	447.3	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.900	0.213	0.0	0.85	60.4
1.001	5.550	0.382	0.0	1.23	196.2
2.000	8.800	0.098	0.0	2.33	92.7
2.001	7.000	0.113	0.0	1.79	71.0
1.002	5.290	0.941	0.0	0.96	207.6
1.003	5.080	1.203	0.0	0.91	197.7
1.004	4.920	1.354	0.0	0.94	203.9
3.000	5.590	0.158	0.0	1.34	94.6
4.000	5.900	0.158	0.0	0.97	68.4
4.001	5.690	0.158	0.0	1.37	96.7
4.002	5.590	0.410	0.0	1.29	91.0
1.005	4.795	2.147	0.0	0.83	180.7
5.000	5.560	0.377	0.0	1.53	108.1
1.006	4.690	2.587	0.0	1.37	386.5
1.007	4.490	2.587	0.0	1.03	290.3


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.008	90.568	0.229	395.5	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit
6.000	17.500	0.220	79.5	0.633	5.00	0.0	0.013	o	375	Pipe/Conduit
6.001	47.600	0.100	476.0	0.303	0.00	0.0	0.013	o	450	Pipe/Conduit
7.000	74.000	0.514	144.0	0.517	5.00	0.0	0.013	o	375	Pipe/Conduit
1.009	11.002	0.031	354.9	0.000	0.00	0.0	0.013	o	675	Pipe/Conduit
1.010	109.581	0.300	365.3	0.200	0.00	0.0	0.013	o	750	Pipe/Conduit
8.000	47.126	0.270	174.5	0.423	5.00	0.0	0.013	o	300	Pipe/Conduit
9.000	18.670	0.107	174.5	0.415	5.00	0.0	0.013	o	375	Pipe/Conduit
8.001	42.561	0.225	189.2	0.135	0.00	0.0	0.013	o	525	Pipe/Conduit
8.002	23.568	0.055	428.5	0.083	0.00	0.0	0.013	o	600	Pipe/Conduit
10.000	97.657	3.100	31.5	0.785	5.00	0.0	0.013	o	375	Pipe/Conduit
8.003	49.095	0.110	446.3	0.099	0.00	0.0	0.013	o	600	Pipe/Conduit
8.004	43.039	0.085	506.3	0.921	0.00	0.0	0.013	o	600	Pipe/Conduit
8.005	15.640	0.040	391.0	1.047	0.00	0.0	0.013	o	600	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.008	4.440	2.587	0.0	1.09	308.7
6.000	6.325	0.633	0.0	1.78	196.6
6.001	6.030	0.936	0.0	0.82	130.7
7.000	6.325	0.517	0.0	1.32	146.1
1.009	4.211	4.040	0.0	1.25	446.2
1.010	4.180	4.240	0.0	1.32	582.5
8.000	5.700	0.423	0.0	1.04	73.2
9.000	5.507	0.415	0.0	1.20	132.7
8.001	5.000	0.973	0.0	1.44	312.7
8.002	4.700	1.056	0.0	1.05	296.6
10.000	8.000	0.785	0.0	2.83	312.4
8.003	4.645	1.940	0.0	1.03	290.6
8.004	4.535	2.861	0.0	0.97	272.9
8.005	4.450	3.908	0.0	1.10	310.5


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.011	151.065	0.302	500.2	0.409	0.00	0.0	0.013	o	750	Pipe/Conduit
11.000	86.676	1.445	60.0	1.520	5.00	0.0	0.013	o	600	Pipe/Conduit
11.001	67.726	2.255	30.0	1.000	0.00	0.0	0.013	o	600	Pipe/Conduit
11.002	53.592	0.200	268.0	0.443	0.00	0.0	0.013	o	750	Pipe/Conduit
1.012	6.892	0.100	68.9	0.000	0.00	0.0	0.013	o	1200	Pipe/Conduit

Network Results Table


PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.011	3.880	8.557	0.0	1.13	497.8
11.000	8.000	1.520	0.0	2.80	792.7
11.001	6.555	2.520	0.0	3.96	1120.4
11.002	4.150	2.963	0.0	1.54	680.1
1.012	3.100	11.520	0.0	4.15	4696.2

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Manhole Schedules for OUTFALL 1200.SWS											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	6.770	0.870	Open Manhole	1200	1.000	5.900	300				
2	7.210	1.660	Open Manhole	1350	1.001	5.550	450	1.000	5.700	300	
20	10.000	1.200	Open Manhole	1200	2.000	8.800	225				
21	8.500	1.500	Open Manhole	1200	2.001	7.000	225	2.000	7.000	225	
3	7.440	2.150	Open Manhole	1500	1.002	5.290	525	1.001	5.290	450	
								2.001	6.453	225	863
4	7.160	2.080	Open Manhole	1500	1.003	5.080	525	1.002	5.080	525	
5	7.110	2.190	Open Manhole	1500	1.004	4.920	525	1.003	4.920	525	
30	8.010	2.420	Open Manhole	1200	3.000	5.590	300				
11	7.200	1.300	Open Manhole	1200	4.000	5.900	300				
12	7.200	1.510	Open Manhole	1200	4.001	5.690	300	4.000	5.690	300	
40	7.200	1.610	Open Manhole	1200	4.002	5.590	300	4.001	5.590	300	
6	7.470	2.675	Open Manhole	1500	1.005	4.795	525	1.004	4.795	525	
								3.000	5.050	300	30
								4.002	5.050	300	30
50	7.660	2.100	Open Manhole	1200	5.000	5.560	300				
7	8.300	3.610	Open Manhole	1500	1.006	4.690	600	1.005	4.690	525	
								5.000	4.990	300	
13	7.630	3.140	Open Manhole	2100	1.007	4.490	600	1.006	4.490	600	
8	7.885	3.445	Open Manhole	1800	1.008	4.440	600	1.007	4.440	600	
60	7.900	1.575	Open Manhole	1200	6.000	6.325	375				
61	7.900	1.870	Open Manhole	1200	6.001	6.030	450	6.000	6.105	375	
70	7.900	1.575	Open Manhole	1350	7.000	6.325	375				
9	7.900	3.689	Open Manhole	1800	1.009	4.211	675	1.008	4.211	600	
								6.001	5.930	450	1494
								7.000	5.811	375	1300
10	7.260	3.080	Open Manhole	1800	1.010	4.180	750	1.009	4.180	675	
80	7.470	1.770	Open Manhole	1200	8.000	5.700	300				
90	7.310	1.803	Open Manhole	1350	9.000	5.507	375				
81	7.200	2.200	Open Manhole	1350	8.001	5.000	525	8.000	5.430	300	205
								9.000	5.400	375	250
82	7.840	3.140	Open Manhole	1500	8.002	4.700	600	8.001	4.775	525	
100	10.000	2.000	Open Manhole	1200	10.000	8.000	375				
83	8.070	3.425	Open Manhole	1500	8.003	4.645	600	8.002	4.645	600	
								10.000	4.900	375	30
84	7.960	3.425	Open Manhole	1500	8.004	4.535	600	8.003	4.535	600	
85	7.960	3.510	Open Manhole	1500	8.005	4.450	600	8.004	4.450	600	
11	7.340	3.460	Open Manhole	1800	1.011	3.880	750	1.010	3.880	750	
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Manhole Schedules for OUTFALL 1200.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
110	10.000	2.000	Open Manhole	1500	11.000	8.000	600	8.005	4.410	600	380
111	8.500	1.945	Open Manhole	1500	11.001	6.555	600	11.000	6.555	600	
112	7.500	3.350	Open Manhole	1800	11.002	4.150	750	11.001	4.300	600	
12	7.500	4.400	Open Manhole	2200	1.012	3.100	1200	1.011	3.578	750	28
								11.002	3.950	750	400
13	7.500	4.500	Open Manhole	0		OUTFALL		1.012	3.000	1200	

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PIPELINE SCHEDULES for OUTFALL 1200.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	6.770	5.900	0.570	Open Manhole	1200
1.001	o	450	2	7.210	5.550	1.210	Open Manhole	1350
2.000	o	225	20	10.000	8.800	0.975	Open Manhole	1200
2.001	o	225	21	8.500	7.000	1.275	Open Manhole	1200
1.002	o	525	3	7.440	5.290	1.625	Open Manhole	1500
1.003	o	525	4	7.160	5.080	1.555	Open Manhole	1500
1.004	o	525	5	7.110	4.920	1.665	Open Manhole	1500
3.000	o	300	30	8.010	5.590	2.120	Open Manhole	1200
4.000	o	300	11	7.200	5.900	1.000	Open Manhole	1200
4.001	o	300	12	7.200	5.690	1.210	Open Manhole	1200
4.002	o	300	40	7.200	5.590	1.310	Open Manhole	1200
1.005	o	525	6	7.470	4.795	2.150	Open Manhole	1500
5.000	o	300	50	7.660	5.560	1.800	Open Manhole	1200
1.006	o	600	7	8.300	4.690	3.010	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	51.319	256.6	2	7.210	5.700	1.210	Open Manhole	1350
1.001	54.917	211.2	3	7.440	5.290	1.700	Open Manhole	1500
2.000	42.272	23.5	21	8.500	7.000	1.275	Open Manhole	1200
2.001	21.880	40.0	3	7.440	6.453	0.762	Open Manhole	1500
1.002	90.086	429.0	4	7.160	5.080	1.555	Open Manhole	1500
1.003	75.701	473.1	5	7.110	4.920	1.665	Open Manhole	1500
1.004	55.589	444.7	6	7.470	4.795	2.150	Open Manhole	1500
3.000	56.476	104.6	6	7.470	5.050	2.120	Open Manhole	1500
4.000	42.000	200.0	12	7.200	5.690	1.210	Open Manhole	1200
4.001	10.000	100.0	40	7.200	5.590	1.310	Open Manhole	1200
4.002	61.000	113.0	6	7.470	5.050	2.120	Open Manhole	1500
1.005	59.467	566.4	7	8.300	4.690	3.085	Open Manhole	1500
5.000	45.627	80.0	7	8.300	4.990	3.010	Open Manhole	1500
1.006	50.475	252.4	13	7.630	4.490	2.540	Open Manhole	2100

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PIPELINE SCHEDULES for OUTFALL 1200.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	600	13	7.630	4.490	2.540	Open Manhole	2100
1.008	o	600	8	7.885	4.440	2.845	Open Manhole	1800
6.000	o	375	60	7.900	6.325	1.200	Open Manhole	1200
6.001	o	450	61	7.900	6.030	1.420	Open Manhole	1200
7.000	o	375	70	7.900	6.325	1.200	Open Manhole	1350
1.009	o	675	9	7.900	4.211	3.014	Open Manhole	1800
1.010	o	750	10	7.260	4.180	2.330	Open Manhole	1800
8.000	o	300	80	7.470	5.700	1.470	Open Manhole	1200
9.000	o	375	90	7.310	5.507	1.428	Open Manhole	1350
8.001	o	525	81	7.200	5.000	1.675	Open Manhole	1350
8.002	o	600	82	7.840	4.700	2.540	Open Manhole	1500
10.000	o	375	100	10.000	8.000	1.625	Open Manhole	1200
8.003	o	600	83	8.070	4.645	2.825	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	22.365	447.3	8	7.885	4.440	2.845	Open Manhole	1800
1.008	90.568	395.5	9	7.900	4.211	3.089	Open Manhole	1800
6.000	17.500	79.5	61	7.900	6.105	1.420	Open Manhole	1200
6.001	47.600	476.0	9	7.900	5.930	1.520	Open Manhole	1800
7.000	74.000	144.0	9	7.900	5.811	1.714	Open Manhole	1800
1.009	11.002	354.9	10	7.260	4.180	2.405	Open Manhole	1800
1.010	109.581	365.3	11	7.340	3.880	2.710	Open Manhole	1800
8.000	47.126	174.5	81	7.200	5.430	1.470	Open Manhole	1350
9.000	18.670	174.5	81	7.200	5.400	1.425	Open Manhole	1350
8.001	42.561	189.2	82	7.840	4.775	2.540	Open Manhole	1500
8.002	23.568	428.5	83	8.070	4.645	2.825	Open Manhole	1500
10.000	97.657	31.5	83	8.070	4.900	2.795	Open Manhole	1500
8.003	49.095	446.3	84	7.960	4.535	2.825	Open Manhole	1500

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PIPELINE SCHEDULES for OUTFALL 1200.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)
8.004	o	600	84	7.960	4.535	2.825	Open Manhole	1500
8.005	o	600	85	7.960	4.450	2.910	Open Manhole	1500
1.011	o	750	11	7.340	3.880	2.710	Open Manhole	1800
11.000	o	600	110	10.000	8.000	1.400	Open Manhole	1500
11.001	o	600	111	8.500	6.555	1.345	Open Manhole	1500
11.002	o	750	112	7.500	4.150	2.600	Open Manhole	1800
1.012	o	1200	12	7.500	3.100	3.200	Open Manhole	2200

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)
8.004	43.039	506.3	85	7.960	4.450	2.910	Open Manhole	1500
8.005	15.640	391.0	11	7.340	4.410	2.330	Open Manhole	1800
1.011	151.065	500.2	12	7.500	3.578	3.172	Open Manhole	2200
11.000	86.676	60.0	111	8.500	6.555	1.345	Open Manhole	1500
11.001	67.726	30.0	112	7.500	4.300	2.600	Open Manhole	1800
11.002	53.592	268.0	12	7.500	3.950	2.800	Open Manhole	2200
1.012	6.892	68.9	13	7.500	3.000	3.300	Open Manhole	0


Surcharged Outfall Details for OUTFALL 1200.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.012	13	7.500	3.000	3.000	0	0
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Datum (m) 3.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	2.250	7	2.250	13	2.250	19	2.250	25	2.250	31	2.250
2	2.250	8	2.250	14	2.250	20	2.250	26	2.250	32	2.250
3	2.250	9	2.250	15	2.250	21	2.250	27	2.250	33	2.250
4	2.250	10	2.250	16	2.250	22	2.250	28	2.250	34	2.250
5	2.250	11	2.250	17	2.250	23	2.250	29	2.250	35	2.250
6	2.250	12	2.250	18	2.250	24	2.250	30	2.250	36	2.250

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Surcharged Outfall Details for OUTFALL 1200.SWS

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
37	2.250	71	2.250	105	2.250	139	2.250	173	2.250	207	2.250
38	2.250	72	2.250	106	2.250	140	2.250	174	2.250	208	2.250
39	2.250	73	2.250	107	2.250	141	2.250	175	2.250	209	2.250
40	2.250	74	2.250	108	2.250	142	2.250	176	2.250	210	2.250
41	2.250	75	2.250	109	2.250	143	2.250	177	2.250	211	2.250
42	2.250	76	2.250	110	2.250	144	2.250	178	2.250	212	2.250
43	2.250	77	2.250	111	2.250	145	2.250	179	2.250	213	2.250
44	2.250	78	2.250	112	2.250	146	2.250	180	2.250	214	2.250
45	2.250	79	2.250	113	2.250	147	2.250	181	2.250	215	2.250
46	2.250	80	2.250	114	2.250	148	2.250	182	2.250	216	2.250
47	2.250	81	2.250	115	2.250	149	2.250	183	2.250	217	2.250
48	2.250	82	2.250	116	2.250	150	2.250	184	2.250	218	2.250
49	2.250	83	2.250	117	2.250	151	2.250	185	2.250	219	2.250
50	2.250	84	2.250	118	2.250	152	2.250	186	2.250	220	2.250
51	2.250	85	2.250	119	2.250	153	2.250	187	2.250	221	2.250
52	2.250	86	2.250	120	2.250	154	2.250	188	2.250	222	2.250
53	2.250	87	2.250	121	2.250	155	2.250	189	2.250	223	2.250
54	2.250	88	2.250	122	2.250	156	2.250	190	2.250	224	2.250
55	2.250	89	2.250	123	2.250	157	2.250	191	2.250	225	2.250
56	2.250	90	2.250	124	2.250	158	2.250	192	2.250	226	2.250
57	2.250	91	2.250	125	2.250	159	2.250	193	2.250	227	2.250
58	2.250	92	2.250	126	2.250	160	2.250	194	2.250	228	2.250
59	2.250	93	2.250	127	2.250	161	2.250	195	2.250	229	2.250
60	2.250	94	2.250	128	2.250	162	2.250	196	2.250	230	2.250
61	2.250	95	2.250	129	2.250	163	2.250	197	2.250	231	2.250
62	2.250	96	2.250	130	2.250	164	2.250	198	2.250	232	2.250
63	2.250	97	2.250	131	2.250	165	2.250	199	2.250	233	2.250
64	2.250	98	2.250	132	2.250	166	2.250	200	2.250	234	2.250
65	2.250	99	2.250	133	2.250	167	2.250	201	2.250	235	2.250
66	2.250	100	2.250	134	2.250	168	2.250	202	2.250	236	2.250
67	2.250	101	2.250	135	2.250	169	2.250	203	2.250	237	2.250
68	2.250	102	2.250	136	2.250	170	2.250	204	2.250	238	2.250
69	2.250	103	2.250	137	2.250	171	2.250	205	2.250	239	2.250
70	2.250	104	2.250	138	2.250	172	2.250	206	2.250	240	2.250

Simulation Criteria for OUTFALL 1200.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 Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0


Synthetic Rainfall Details

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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)	20.000	Storm Duration (mins) 30
Ratio R	0.400	

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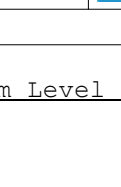
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Storage Structures for OUTFALL 1200.SWS

Cellular Storage Manhole: 40, DS/PN: 4.002

Invert Level (m) 5.590 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)
0.000	440.0	420.0	1.300	0.0	506.1
0.100	440.0	428.2	1.400	0.0	506.1
0.200	440.0	436.4	1.500	0.0	506.1
0.300	440.0	444.6	1.600	0.0	506.1
0.400	440.0	452.8	1.700	0.0	506.1
0.500	440.0	461.0	1.800	0.0	506.1
0.600	440.0	469.2	1.900	0.0	506.1
0.700	440.0	477.4	2.000	0.0	506.1
0.800	440.0	485.6	2.100	0.0	506.1
0.900	440.0	493.8	2.200	0.0	506.1
1.000	440.0	502.0	2.300	0.0	506.1
1.100	0.0	506.1	2.400	0.0	506.1
1.200	0.0	506.1	2.500	0.0	506.1

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.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 Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1 15	Winter	1	+0%	30/15 Summer	30/15 Summer		
1.001	2 30	Winter	1	+0%	30/15 Summer	30/15 Winter		
2.000	20 15	Winter	1	+0%				
2.001	21 15	Winter	1	+0%	30/15 Summer			
1.002	3 30	Winter	1	+0%	1/30 Winter	100/15 Summer		
1.003	4 30	Winter	1	+0%	1/15 Summer	30/15 Summer		
1.004	5 30	Winter	1	+0%	1/15 Summer	30/15 Summer		
3.000	30 30	Winter	1	+0%	30/15 Summer			
4.000	11 15	Winter	1	+0%	100/15 Summer			
4.001	12 15	Winter	1	+0%	30/30 Winter			
4.002	40 60	Winter	1	+0%	30/15 Winter			
1.005	6 30	Winter	1	+0%	1/15 Summer	100/15 Summer		
5.000	50 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
1.006	7 15	Winter	1	+0%	1/15 Summer			
1.007	13 15	Summer	1	+0%	1/15 Summer			
1.008	8 15	Winter	1	+0%	1/15 Summer			
6.000	60 15	Winter	1	+0%	30/15 Summer	100/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.053	-0.147	0.000	0.51		29.2		OK		19
1.001	2	5.861	-0.139	0.000	0.21		39.2		OK		9
2.000	20	8.859	-0.166	0.000	0.15		13.4		OK		
2.001	21	7.074	-0.151	0.000	0.23		15.2		OK		
1.002	3	5.829	0.014	0.000	0.42		82.1	SURCHARGED			2
1.003	4	5.803	0.198	0.000	0.39		72.1	SURCHARGED			14
1.004	5	5.771	0.326	0.000	0.36		67.9	SURCHARGED			14
3.000	30	5.754	-0.136	0.000	0.19		17.1		OK		
4.000	11	6.021	-0.179	0.000	0.33		21.4		OK		
4.001	12	5.795	-0.195	0.000	0.27		21.4		OK		
4.002	40	5.672	-0.218	0.000	0.16		13.8		OK		
1.005	6	5.742	0.422	0.000	0.49		81.5	SURCHARGED			2
5.000	50	5.828	-0.032	0.000	0.51		52.2		OK		7
1.006	7	5.817	0.527	0.000	0.30		104.5	SURCHARGED			
1.007	13	5.933	0.843	0.000	0.29		68.6	SURCHARGED			
1.008	8	5.776	0.736	0.000	0.25		73.6	SURCHARGED			
6.000	60	6.520	-0.180	0.000	0.52		87.3		OK		6

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
7.000	70 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
1.009	9 15	Summer	1	+0%	1/15 Summer			
1.010	10 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
8.000	80 15	Winter	1	+0%	1/15 Winter	30/15 Summer		
9.000	90 15	Winter	1	+0%	1/15 Summer	30/15 Summer		
8.001	81 15	Summer	1	+0%	1/15 Summer	30/15 Summer		
8.002	82 15	Summer	1	+0%	1/15 Summer	100/15 Summer		
10.000	100 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
8.003	83 15	Summer	1	+0%	1/15 Summer			
8.004	84 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
8.005	85 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
1.011	11 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
11.000	110 15	Winter	1	+0%	100/15 Summer			
11.001	111 15	Winter	1	+0%	100/15 Summer	100/15 Summer		
11.002	112 15	Summer	1	+0%	1/15 Summer			
1.012	12 15	Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
6.001	61	6.404	-0.076	0.000	0.99	120.0	OK	1
7.000	70	6.517	-0.183	0.000	0.51	72.0	OK	6
1.009	9	6.025	1.139	0.000	0.59	161.3	SURCHARGED	
1.010	10	5.752	0.822	0.000	0.22	120.7	SURCHARGED	6
8.000	80	6.081	0.081	0.000	0.84	58.9	SURCHARGED	15
9.000	90	6.060	0.178	0.000	0.50	56.8	SURCHARGED	15
8.001	81	5.985	0.460	0.000	0.43	121.8	SURCHARGED	16
8.002	82	5.962	0.662	0.000	0.37	88.4	SURCHARGED	2
10.000	100	8.156	-0.219	0.000	0.35	107.1	OK	5
8.003	83	5.989	0.744	0.000	0.64	166.5	SURCHARGED	
8.004	84	5.801	0.666	0.000	0.93	224.0	SURCHARGED	4
8.005	85	5.706	0.656	0.000	1.57	328.6	SURCHARGED	1
1.011	11	5.759	1.129	0.000	0.80	378.3	SURCHARGED	
11.000	110	8.219	-0.381	0.000	0.28	207.8	OK	
11.001	111	6.781	-0.374	0.000	0.31	315.7	OK	2
11.002	112	5.626	0.726	0.000	0.54	320.3	SURCHARGED	
1.012	12	5.528	1.228	0.000	0.30	591.5	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.854	0.654	83.888	2.02		116.4		FLOOD		19
1.001	2	7.212	1.212	2.109	0.62		114.3		FLOOD		9
2.000	20	8.896	-0.129	0.000	0.37		33.1		OK		
2.001	21	7.412	0.187	0.000	0.56		36.9		SURCHARGED		
1.002	3	7.322	1.507	0.000	0.80		158.2		FLOOD RISK		2
1.003	4	7.177	1.572	17.547	0.72		133.7		FLOOD		14
1.004	5	7.137	1.692	26.606	0.76		143.1		FLOOD		14
3.000	30	7.336	1.446	0.000	0.49		44.2		SURCHARGED		
4.000	11	6.112	-0.088	0.000	0.81		52.6		OK		
4.001	12	6.092	0.102	0.000	0.34		27.1		SURCHARGED		
4.002	40	6.087	0.197	0.000	0.84		73.4		SURCHARGED		
1.005	6	7.224	1.904	0.000	0.94		157.6		FLOOD RISK		2
5.000	50	7.618	1.758	0.000	0.94		96.6		FLOOD RISK		7
1.006	7	7.255	1.965	0.000	0.45		157.8		SURCHARGED		
1.007	13	7.219	2.129	0.000	0.67		158.0		SURCHARGED		
1.008	8	7.192	2.152	0.000	0.54		156.1		SURCHARGED		
6.000	60	7.582	0.882	0.000	1.10		185.0		SURCHARGED		6

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
7.000	70	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.009	9	15 Winter	30	+0%	1/15 Summer			
1.010	10	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
8.000	80	15 Winter	30	+0%	1/15 Winter	30/15 Summer		
9.000	90	30 Winter	30	+0%	1/15 Summer	30/15 Summer		
8.001	81	30 Winter	30	+0%	1/15 Summer	30/15 Summer		
8.002	82	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
10.000	100	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
8.003	83	15 Winter	30	+0%	1/15 Summer			
8.004	84	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
8.005	85	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
1.011	11	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
11.000	110	15 Winter	30	+0%	100/15 Summer			
11.001	111	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
11.002	112	15 Summer	30	+0%	1/15 Summer			
1.012	12	15 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Overflow (l/s)	Flow (l/s)	Overflow (l/s)		
6.001	61	7.434	0.954	0.000	2.17		262.3		262.3		SURCHARGED	1
7.000	70	7.464	0.764	0.000	1.00		139.9		139.9		SURCHARGED	6
1.009	9	7.151	2.265	0.000	1.49		405.1		405.1		SURCHARGED	
1.010	10	7.100	2.170	0.000	0.76		410.8		410.8		FLOOD RISK	6
8.000	80	7.481	1.481	11.404	1.10		76.5		76.5		FLOOD	15
9.000	90	7.316	1.434	6.095	0.90		103.1		103.1		FLOOD	15
8.001	81	7.287	1.762	87.182	0.70		195.6		195.6		FLOOD	16
8.002	82	7.488	2.188	0.000	0.84		201.7		201.7		SURCHARGED	2
10.000	100	9.045	0.670	0.000	0.71		215.4		215.4		SURCHARGED	5
8.003	83	7.577	2.332	0.000	1.04		271.0		271.0		SURCHARGED	
8.004	84	7.567	2.432	0.000	1.86		448.8		448.8		SURCHARGED	4
8.005	85	7.390	2.340	0.000	3.33		694.5		694.5		SURCHARGED	1
1.011	11	6.932	2.302	0.000	2.00		948.1		948.1		SURCHARGED	
11.000	110	8.374	-0.226	0.000	0.69		509.7		509.7		OK	
11.001	111	7.078	-0.077	0.000	0.76		780.4		780.4		OK	2
11.002	112	5.966	1.066	0.000	1.47		874.4		874.4		SURCHARGED	
1.012	12	5.504	1.204	0.000	0.86		1689.0		1689.0		SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)		Flow (l/s)		
1.000	1	7.021	0.821	251.047	2.21	127.6	FLOOD	19
1.001	2	7.246	1.246	36.341	0.65	119.6	FLOOD	9
2.000	20	8.931	-0.094	0.000	0.63	55.8	OK	
2.001	21	8.008	0.783	0.000	0.99	65.9	SURCHARGED	
1.002	3	7.443	1.628	2.919	1.02	201.8	FLOOD	2
1.003	4	7.268	1.663	107.780	0.69	129.1	FLOOD	14
1.004	5	7.250	1.805	139.956	0.58	109.5	FLOOD	14
3.000	30	7.958	2.068	0.000	0.94	85.0	FLOOD RISK	
4.000	11	6.564	0.364	0.000	0.41	26.9	SURCHARGED	
4.001	12	6.548	0.558	0.000	0.33	26.2	SURCHARGED	
4.002	40	6.540	0.650	0.000	1.02	89.5	SURCHARGED	
1.005	6	7.471	2.151	0.685	1.02	170.9	FLOOD	2
5.000	50	7.693	1.833	33.447	1.12	114.7	FLOOD	7
1.006	7	7.537	2.247	0.000	0.48	168.0	SURCHARGED	
1.007	13	7.516	2.426	0.000	0.72	167.7	FLOOD RISK	
1.008	8	7.489	2.449	0.000	0.58	166.8	SURCHARGED	
6.000	60	7.954	1.254	54.146	1.10	184.7	FLOOD	6


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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
7.000	70	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
1.009	9	30 Summer	100	+30%	1/15 Summer			
1.010	10	30 Winter	100	+30%	1/15 Summer	100/15 Summer		
8.000	80	30 Winter	100	+30%	1/15 Winter	30/15 Summer		
9.000	90	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
8.001	81	30 Winter	100	+30%	1/15 Summer	30/15 Summer		
8.002	82	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
10.000	100	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
8.003	83	30 Summer	100	+30%	1/15 Summer			
8.004	84	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
8.005	85	15 Summer	100	+30%	1/15 Summer	100/15 Summer		
1.011	11	15 Summer	100	+30%	1/15 Summer	100/15 Summer		
11.000	110	15 Winter	100	+30%	100/15 Summer			
11.001	111	15 Winter	100	+30%	100/15 Summer	100/15 Summer		
11.002	112	15 Winter	100	+30%	1/15 Summer			
1.012	12	15 Winter	100	+30%	1/15 Summer			

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Flow / (l/s)	Overflow (l/s)	Flow (l/s)	Level		
6.001	61	7.900	1.420	0.160	2.42			292.4		FLOOD	1
7.000	70	7.927	1.227	27.170	1.09			153.0		FLOOD	6
1.009	9	7.451	2.565	0.000	1.75			474.5		SURCHARGED	
1.010	10	7.362	2.432	102.910	1.04			565.5		FLOOD	6
8.000	80	7.533	1.533	63.313	1.11			77.4		FLOOD	15
9.000	90	7.429	1.547	118.525	0.92			105.3		FLOOD	15
8.001	81	7.458	1.933	258.662	0.94			264.2		FLOOD	16
8.002	82	7.841	2.541	0.866	1.04			250.6		FLOOD	2
10.000	100	10.033	1.658	32.555	0.85			256.0		FLOOD	5
8.003	83	7.992	2.747	0.000	0.98			255.4		FLOOD RISK	
8.004	84	8.001	2.866	40.512	1.86			447.8		FLOOD	4
8.005	85	7.961	2.911	1.303	3.78			790.4		FLOOD	1
1.011	11	7.321	2.691	0.203	2.24			1060.3		FLOOD	
11.000	110	9.945	1.345	0.000	0.97			723.0		FLOOD RISK	
11.001	111	8.517	1.362	17.236	1.00			1031.8		FLOOD	2
11.002	112	6.378	1.478	0.000	2.00			1193.0		SURCHARGED	
1.012	12	5.748	1.448	0.000	1.11			2186.4		SURCHARGED	

Appendix 7e – Drainage Model Files – Application 1B ‘Half Tide Wharf’ Area


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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	57.667	0.235	245.4	0.115	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	49.237	0.200	246.2	0.109	0.00	0.0	0.013	o	300	Pipe/Conduit
1.002	14.797	0.060	246.6	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.003	34.432	0.138	250.0	0.100	5.00	0.0	0.013	o	300	Pipe/Conduit
2.000	38.985	0.310	125.8	0.200	5.00	0.0	0.013	o	300	Pipe/Conduit
2.001	45.364	0.340	133.4	0.035	0.00	0.0	0.013	o	300	Pipe/Conduit
2.002	31.067	0.230	135.1	0.025	0.00	0.0	0.013	o	300	Pipe/Conduit
2.003	11.855	0.175	67.7	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
3.000	22.765	0.152	149.8	0.148	5.00	0.0	0.013	o	150	Pipe/Conduit
4.000	57.667	0.235	245.4	0.132	5.00	0.0	0.013	o	300	Pipe/Conduit
4.001	44.273	0.180	246.0	0.144	0.00	0.0	0.013	o	300	Pipe/Conduit
4.002	23.769	0.095	250.0	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.004	21.096	0.045	468.8	0.024	0.00	0.0	0.013	o	375	Pipe/Conduit
5.000	20.000	0.100	200.0	0.364	5.00	0.0	0.013	o	375	Pipe/Conduit
5.001	12.936	0.475	27.2	0.000	0.00	0.0	0.013	o	150	Pipe/Conduit
1.005	38.650	0.080	483.1	0.081	0.00	0.0	0.013	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	6.150	0.115	0.0	0.87	61.7
1.001	5.915	0.224	0.0	0.87	61.6
1.002	5.715	0.224	0.0	0.87	61.6
1.003	5.655	0.324	0.0	0.87	61.2
2.000	6.580	0.200	0.0	1.22	86.2
2.001	6.270	0.235	0.0	1.18	83.7
2.002	5.930	0.260	0.0	1.18	83.2
2.003	5.700	0.260	0.0	1.66	117.5
3.000	5.600	0.148	0.0	0.70	12.4
4.000	6.000	0.132	0.0	0.87	61.7
4.001	5.765	0.276	0.0	0.87	61.7
4.002	5.585	0.276	0.0	0.87	61.2
1.004	5.450	1.032	0.0	0.73	81.0
5.000	5.980	0.364	0.0	1.12	124.0
5.001	5.880	0.364	0.0	1.65	29.2
1.005	5.405	1.477	0.0	0.72	79.8


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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.006	46.501	0.104	447.1	0.288	0.00	0.0	0.013	o	450	Pipe/Conduit
1.007	33.647	0.075	448.6	0.121	0.00	0.0	0.013	o	450	Pipe/Conduit
1.008	29.891	0.230	130.0	0.042	0.00	0.0	0.013	o	450	Pipe/Conduit
6.000	4.672	0.100	46.7	0.069	5.00	0.0	0.013	o	600	Pipe/Conduit
7.000	89.092	0.800	111.4	0.131	2.00	0.0	0.013	o	225	Pipe/Conduit
6.001	21.172	0.075	282.3	0.059	0.00	0.0	0.013	o	600	Pipe/Conduit
1.009	40.384	0.090	448.7	1.044	0.00	0.0	0.013	o	600	Pipe/Conduit
8.000	95.909	0.250	383.6	1.366	5.00	0.0	0.013	o	600	Pipe/Conduit
1.010	12.545	0.100	125.5	0.000	0.00	0.0	0.013	o	900	Pipe/Conduit


Network Results Table

PN	US/IL (m)	I.Area (ha)	E Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.006	5.254	1.765	0.0	0.85	134.8
1.007	5.150	1.886	0.0	0.85	134.6
1.008	5.075	1.928	0.0	1.57	250.1
6.000	5.500	0.069	0.0	3.18	898.3
7.000	5.800	0.131	0.0	1.07	42.5
6.001	4.675	0.259	0.0	1.29	365.4
1.009	4.590	3.231	0.0	1.03	289.9
8.000	5.000	1.366	0.0	1.11	313.5
1.010	4.300	4.597	0.0	2.54	1616.3

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Manhole Schedules for OUTFALL 900.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	7.200	1.050	Open Manhole	1200	1.000	6.150	300				
2	7.200	1.285	Open Manhole	1200	1.001	5.915	300	1.000	5.915	300	
3	7.200	1.485	Open Manhole	1200	1.002	5.715	300	1.001	5.715	300	
1	6.750	1.095	Open Manhole	1200	1.003	5.655	300	1.002	5.655	300	
10	7.980	1.400	Open Manhole	1200	2.000	6.580	300				
11	7.300	1.030	Open Manhole	1200	2.001	6.270	300	2.000	6.270	300	
12	6.930	1.000	Open Manhole	1200	2.002	5.930	300	2.001	5.930	300	
13	6.760	1.060	Open Manhole	1200	2.003	5.700	300	2.002	5.700	300	
6	7.300	1.700	Open Manhole	1200	3.000	5.600	150				
7	7.200	1.200	Open Manhole	1200	4.000	6.000	300				
8	7.200	1.435	Open Manhole	1200	4.001	5.765	300	4.000	5.765	300	
9	7.200	1.615	Open Manhole	1200	4.002	5.585	300	4.001	5.585	300	
7	6.670	1.222	Open Manhole	1350	1.004	5.450	375	1.003	5.517	300	
								2.003	5.525	300	
								3.000	5.448	150	
								4.002	5.490	300	
14	7.280	1.300	Open Manhole	1200	5.000	5.980	375				
15	7.200	1.320	Open Manhole	1200	5.001	5.880	150	5.000	5.880	375	
14	6.600	1.195	Open Manhole	1200	1.005	5.405	375	1.004	5.405	375	
								5.001	5.405	150	
8	6.680	1.426	Open Manhole	1350	1.006	5.254	450	1.005	5.325	375	
9	6.800	1.650	Open Manhole	1350	1.007	5.150	450	1.006	5.150	450	
10	7.100	2.025	Open Manhole	1350	1.008	5.075	450	1.007	5.075	450	
11	7.500	2.000	Open Manhole	1500	6.000	5.500	600				
12	7.300	1.500	Open Manhole	1200	7.000	5.800	225				
13	7.460	2.785	Open Manhole	1500	6.001	4.675	600	6.000	5.400	600	725
								7.000	5.000	225	
14	7.370	2.780	Open Manhole	1500	1.009	4.590	600	1.008	4.845	450	105
								6.001	4.600	600	10
15	7.350	2.350	Open Manhole	1500	8.000	5.000	600				
16	7.400	3.100	Open Manhole	1800	1.010	4.300	900	1.009	4.500	600	
								8.000	4.750	600	150
8	7.300	3.100	Open Manhole	0		OUTFALL		1.010	4.200	900	

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PIPELINE SCHEDULES for OUTFALL 900.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	7.200	6.150	0.750	Open Manhole	1200
1.001	o	300	2	7.200	5.915	0.985	Open Manhole	1200
1.002	o	300	3	7.200	5.715	1.185	Open Manhole	1200
1.003	o	300	1	6.750	5.655	0.795	Open Manhole	1200
2.000	o	300	10	7.980	6.580	1.100	Open Manhole	1200
2.001	o	300	11	7.300	6.270	0.730	Open Manhole	1200
2.002	o	300	12	6.930	5.930	0.700	Open Manhole	1200
2.003	o	300	13	6.760	5.700	0.760	Open Manhole	1200
3.000	o	150	6	7.300	5.600	1.550	Open Manhole	1200
4.000	o	300	7	7.200	6.000	0.900	Open Manhole	1200
4.001	o	300	8	7.200	5.765	1.135	Open Manhole	1200
4.002	o	300	9	7.200	5.585	1.315	Open Manhole	1200
1.004	o	375	7	6.670	5.450	0.845	Open Manhole	1350
5.000	o	375	14	7.280	5.980	0.925	Open Manhole	1200
5.001	o	150	15	7.200	5.880	1.170	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)
1.000	57.667	245.4	2	7.200	5.915	0.985	Open Manhole	1200
1.001	49.237	246.2	3	7.200	5.715	1.185	Open Manhole	1200
1.002	14.797	246.6	1	6.750	5.655	0.795	Open Manhole	1200
1.003	34.432	250.0	7	6.670	5.517	0.853	Open Manhole	1350
2.000	38.985	125.8	11	7.300	6.270	0.730	Open Manhole	1200
2.001	45.364	133.4	12	6.930	5.930	0.700	Open Manhole	1200
2.002	31.067	135.1	13	6.760	5.700	0.760	Open Manhole	1200
2.003	11.855	67.7	7	6.670	5.525	0.845	Open Manhole	1350
3.000	22.765	149.8	7	6.670	5.448	1.072	Open Manhole	1350
4.000	57.667	245.4	8	7.200	5.765	1.135	Open Manhole	1200
4.001	44.273	246.0	9	7.200	5.585	1.315	Open Manhole	1200
4.002	23.769	250.0	7	6.670	5.490	0.880	Open Manhole	1350
1.004	21.096	468.8	14	6.600	5.405	0.820	Open Manhole	1200
5.000	20.000	200.0	15	7.200	5.880	0.945	Open Manhole	1200
5.001	12.936	27.2	14	6.600	5.405	1.045	Open Manhole	1200

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PIPELINE SCHEDULES for OUTFALL 900.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)
1.005	o	375	14	6.600	5.405	0.820	Open Manhole	1200
1.006	o	450	8	6.680	5.254	0.976	Open Manhole	1350
1.007	o	450	9	6.800	5.150	1.200	Open Manhole	1350
1.008	o	450	10	7.100	5.075	1.575	Open Manhole	1350
6.000	o	600	11	7.500	5.500	1.400	Open Manhole	1500
7.000	o	225	12	7.300	5.800	1.275	Open Manhole	1200
6.001	o	600	13	7.460	4.675	2.185	Open Manhole	1500
1.009	o	600	14	7.370	4.590	2.180	Open Manhole	1500
8.000	o	600	15	7.350	5.000	1.750	Open Manhole	1500
1.010	o	900	16	7.400	4.300	2.200	Open Manhole	1800

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)
1.005	38.650	483.1	8	6.680	5.325	0.980	Open Manhole	1350
1.006	46.501	447.1	9	6.800	5.150	1.200	Open Manhole	1350
1.007	33.647	448.6	10	7.100	5.075	1.575	Open Manhole	1350
1.008	29.891	130.0	14	7.370	4.845	2.075	Open Manhole	1500
6.000	4.672	46.7	13	7.460	5.400	1.460	Open Manhole	1500
7.000	89.092	111.4	13	7.460	5.000	2.235	Open Manhole	1500
6.001	21.172	282.3	14	7.370	4.600	2.170	Open Manhole	1500
1.009	40.384	448.7	16	7.400	4.500	2.300	Open Manhole	1800
8.000	95.909	383.6	16	7.400	4.750	2.050	Open Manhole	1800
1.010	12.545	125.5	8	7.300	4.200	2.200	Open Manhole	0

Surcharged Outfall Details for OUTFALL 900.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010		8	7.300	4.200	0	0


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Surcharged Outfall Details for OUTFALL 900.SWS

Datum (m) 4.200 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.250	41	1.250	81	1.250	121	1.250	161	1.250	201	1.250
2	1.250	42	1.250	82	1.250	122	1.250	162	1.250	202	1.250
3	1.250	43	1.250	83	1.250	123	1.250	163	1.250	203	1.250
4	1.250	44	1.250	84	1.250	124	1.250	164	1.250	204	1.250
5	1.250	45	1.250	85	1.250	125	1.250	165	1.250	205	1.250
6	1.250	46	1.250	86	1.250	126	1.250	166	1.250	206	1.250
7	1.250	47	1.250	87	1.250	127	1.250	167	1.250	207	1.250
8	1.250	48	1.250	88	1.250	128	1.250	168	1.250	208	1.250
9	1.250	49	1.250	89	1.250	129	1.250	169	1.250	209	1.250
10	1.250	50	1.250	90	1.250	130	1.250	170	1.250	210	1.250
11	1.250	51	1.250	91	1.250	131	1.250	171	1.250	211	1.250
12	1.250	52	1.250	92	1.250	132	1.250	172	1.250	212	1.250
13	1.250	53	1.250	93	1.250	133	1.250	173	1.250	213	1.250
14	1.250	54	1.250	94	1.250	134	1.250	174	1.250	214	1.250
15	1.250	55	1.250	95	1.250	135	1.250	175	1.250	215	1.250
16	1.250	56	1.250	96	1.250	136	1.250	176	1.250	216	1.250
17	1.250	57	1.250	97	1.250	137	1.250	177	1.250	217	1.250
18	1.250	58	1.250	98	1.250	138	1.250	178	1.250	218	1.250
19	1.250	59	1.250	99	1.250	139	1.250	179	1.250	219	1.250
20	1.250	60	1.250	100	1.250	140	1.250	180	1.250	220	1.250
21	1.250	61	1.250	101	1.250	141	1.250	181	1.250	221	1.250
22	1.250	62	1.250	102	1.250	142	1.250	182	1.250	222	1.250
23	1.250	63	1.250	103	1.250	143	1.250	183	1.250	223	1.250
24	1.250	64	1.250	104	1.250	144	1.250	184	1.250	224	1.250
25	1.250	65	1.250	105	1.250	145	1.250	185	1.250	225	1.250
26	1.250	66	1.250	106	1.250	146	1.250	186	1.250	226	1.250
27	1.250	67	1.250	107	1.250	147	1.250	187	1.250	227	1.250
28	1.250	68	1.250	108	1.250	148	1.250	188	1.250	228	1.250
29	1.250	69	1.250	109	1.250	149	1.250	189	1.250	229	1.250
30	1.250	70	1.250	110	1.250	150	1.250	190	1.250	230	1.250
31	1.250	71	1.250	111	1.250	151	1.250	191	1.250	231	1.250
32	1.250	72	1.250	112	1.250	152	1.250	192	1.250	232	1.250
33	1.250	73	1.250	113	1.250	153	1.250	193	1.250	233	1.250
34	1.250	74	1.250	114	1.250	154	1.250	194	1.250	234	1.250
35	1.250	75	1.250	115	1.250	155	1.250	195	1.250	235	1.250
36	1.250	76	1.250	116	1.250	156	1.250	196	1.250	236	1.250
37	1.250	77	1.250	117	1.250	157	1.250	197	1.250	237	1.250
38	1.250	78	1.250	118	1.250	158	1.250	198	1.250	238	1.250
39	1.250	79	1.250	119	1.250	159	1.250	199	1.250	239	1.250
40	1.250	80	1.250	120	1.250	160	1.250	200	1.250	240	1.250


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Simulation Criteria for OUTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Storage Structures for OUTFALL 900.SWS

Cellular Storage Manhole: 2, DS/PN: 1.001

Invert Level (m) 5.915 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
 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)
0.000	178.0	178.0	1.300	0.0	207.4
0.100	178.0	183.3	1.400	0.0	207.4
0.200	178.0	188.7	1.500	0.0	207.4
0.300	178.0	194.0	1.600	0.0	207.4
0.400	178.0	199.3	1.700	0.0	207.4
0.500	178.0	204.7	1.800	0.0	207.4
0.600	0.0	207.4	1.900	0.0	207.4
0.700	0.0	207.4	2.000	0.0	207.4
0.800	0.0	207.4	2.100	0.0	207.4
0.900	0.0	207.4	2.200	0.0	207.4
1.000	0.0	207.4	2.300	0.0	207.4
1.100	0.0	207.4	2.400	0.0	207.4
1.200	0.0	207.4	2.500	0.0	207.4


Cellular Storage Manhole: 1, DS/PN: 1.003

Invert Level (m) 5.560 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
 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)
0.000	160.0	160.0	1.300	0.0	187.8
0.100	160.0	165.1	1.400	0.0	187.8
0.200	160.0	170.1	1.500	0.0	187.8
0.300	160.0	175.2	1.600	0.0	187.8
0.400	160.0	180.2	1.700	0.0	187.8
0.500	160.0	185.3	1.800	0.0	187.8
0.600	0.0	187.8	1.900	0.0	187.8
0.700	0.0	187.8	2.000	0.0	187.8
0.800	0.0	187.8	2.100	0.0	187.8
0.900	0.0	187.8	2.200	0.0	187.8
1.000	0.0	187.8	2.300	0.0	187.8
1.100	0.0	187.8	2.400	0.0	187.8
1.200	0.0	187.8	2.500	0.0	187.8

Cellular Storage Manhole: 6, DS/PN: 3.000

Invert Level (m) 5.600 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: 6, DS/PN: 3.000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	200.0	200.0	1.300	0.0	231.1
0.100	200.0	205.7	1.400	0.0	231.1
0.200	200.0	211.3	1.500	0.0	231.1
0.300	200.0	217.0	1.600	0.0	231.1
0.400	200.0	222.6	1.700	0.0	231.1
0.500	200.0	228.3	1.800	0.0	231.1
0.600	0.0	231.1	1.900	0.0	231.1
0.700	0.0	231.1	2.000	0.0	231.1
0.800	0.0	231.1	2.100	0.0	231.1
0.900	0.0	231.1	2.200	0.0	231.1
1.000	0.0	231.1	2.300	0.0	231.1
1.100	0.0	231.1	2.400	0.0	231.1
1.200	0.0	231.1	2.500	0.0	231.1

Cellular Storage Manhole: 8, DS/PN: 4.001


Invert Level (m) 5.765 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	160.0	150.0	1.300	0.0	176.9
0.100	160.0	154.9	1.400	0.0	176.9
0.200	160.0	159.8	1.500	0.0	176.9
0.300	160.0	164.7	1.600	0.0	176.9
0.400	160.0	169.6	1.700	0.0	176.9
0.500	160.0	174.5	1.800	0.0	176.9
0.600	0.0	176.9	1.900	0.0	176.9
0.700	0.0	176.9	2.000	0.0	176.9
0.800	0.0	176.9	2.100	0.0	176.9
0.900	0.0	176.9	2.200	0.0	176.9
1.000	0.0	176.9	2.300	0.0	176.9
1.100	0.0	176.9	2.400	0.0	176.9
1.200	0.0	176.9	2.500	0.0	176.9

Cellular Storage Manhole: 14, DS/PN: 5.000

Invert Level (m) 5.980 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	465.0	465.0	0.600	0.0	503.8
0.100	465.0	473.6	0.700	0.0	503.8
0.200	465.0	482.3	0.800	0.0	503.8
0.300	465.0	490.9	0.900	0.0	503.8
0.400	465.0	499.5	1.000	0.0	503.8
0.500	0.0	503.8	1.100	0.0	503.8

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Cellular Storage Manhole: 14, DS/PN: 5.000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
1.200	0.0	503.8	1.900	0.0	503.8
1.300	0.0	503.8	2.000	0.0	503.8
1.400	0.0	503.8	2.100	0.0	503.8
1.500	0.0	503.8	2.200	0.0	503.8
1.600	0.0	503.8	2.300	0.0	503.8
1.700	0.0	503.8	2.400	0.0	503.8
1.800	0.0	503.8	2.500	0.0	503.8

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	15 Winter	1	+0%	100/15 Summer			
1.001	2	60 Winter	1	+0%	100/30 Winter			
1.002	3	60 Winter	1	+0%	100/15 Summer			
1.003	1	240 Winter	1	+0%	100/15 Summer			
2.000	10	15 Winter	1	+0%	100/15 Summer			
2.001	11	15 Winter	1	+0%	30/15 Winter	100/15 Summer		
2.002	12	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
2.003	13	15 Winter	1	+0%	30/15 Summer			
3.000	6	60 Winter	1	+0%	30/15 Winter			
4.000	7	15 Winter	1	+0%	100/15 Summer			
4.001	8	30 Winter	1	+0%	100/15 Summer			
4.002	9	30 Winter	1	+0%	30/15 Summer			
1.004	7	15 Winter	1	+0%	30/15 Summer			
5.000	14	120 Winter	1	+0%				
5.001	15	120 Winter	1	+0%	30/15 Summer			
1.005	14	30 Winter	1	+0%	30/15 Summer			
1.006	8	30 Winter	1	+0%	30/15 Summer	100/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

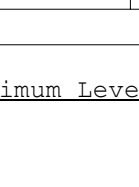
PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		Exceeded
1.000	1	6.256	-0.194	0.000	0.26		15.7	OK	
1.001	2	5.990	-0.225	0.000	0.14		8.4	OK	
1.002	3	5.794	-0.221	0.000	0.16		8.4	OK	
1.003	1	5.719	-0.236	0.000	0.10		5.8	OK	
2.000	10	6.702	-0.178	0.000	0.34		27.3	OK	
2.001	11	6.400	-0.170	0.000	0.38		30.6	OK	4
2.002	12	6.068	-0.162	0.000	0.43		33.2	OK	2
2.003	13	5.820	-0.180	0.000	0.33		32.9	OK	
3.000	6	5.668	-0.082	0.000	0.40		4.8	OK	
4.000	7	6.115	-0.185	0.000	0.30		17.7	OK	
4.001	8	5.857	-0.208	0.000	0.21		12.0	OK	
4.002	9	5.709	-0.176	0.000	0.23		12.7	OK	
1.004	7	5.693	-0.132	0.000	0.50		34.0	OK	
5.000	14	6.044	-0.311	0.000	0.07		7.4	OK	
5.001	15	5.933	-0.097	0.000	0.27		7.4	OK	
1.005	14	5.662	-0.118	0.000	0.58		42.8	OK	
1.006	8	5.620	-0.084	0.000	0.49		61.2	OK	3

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.007	9	30 Winter	1	+0%	30/15 Summer			
1.008	10	30 Winter	1	+0%	1/15 Summer			
6.000	11	15 Winter	1	+0%	100/15 Summer			
7.000	12	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
6.001	13	30 Winter	1	+0%	1/15 Summer			
1.009	14	30 Winter	1	+0%	1/15 Summer			
8.000	15	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.010	16	15 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		Flow (l/s)			
1.007	9	5.585	-0.015	0.000	0.58		69.5				OK	
1.008	10	5.550	0.025	0.000	0.33		72.6				SURCHARGED	
6.000	11	5.566	-0.534	0.000	0.03		9.6				OK	
7.000	12	5.924	-0.101	0.000	0.51		21.3				OK	4
6.001	13	5.524	0.249	0.000	0.09		26.4				SURCHARGED	
1.009	14	5.519	0.329	0.000	0.70		179.2				SURCHARGED	
8.000	15	5.561	-0.039	0.000	0.54		158.6				OK	1
1.010	16	5.470	0.270	0.000	0.33		311.7				SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)		Summer and Winter	
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080		
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.
1.000	1 15	Winter	30	+0%	100/15	Summer		
1.001	2 30	Winter	30	+0%	100/30	Winter		
1.002	3 60	Winter	30	+0%	100/15	Summer		
1.003	1 60	Winter	30	+0%	100/15	Summer		
2.000	10 15	Winter	30	+0%	100/15	Summer		
2.001	11 15	Winter	30	+0%	30/15	Winter	100/15	Summer
2.002	12 15	Winter	30	+0%	30/15	Summer	100/15	Summer
2.003	13 15	Winter	30	+0%	30/15	Summer		
3.000	6 60	Winter	30	+0%	30/15	Winter		
4.000	7 15	Winter	30	+0%	100/15	Summer		
4.001	8 30	Winter	30	+0%	100/15	Summer		
4.002	9 15	Winter	30	+0%	30/15	Summer		
1.004	7 15	Winter	30	+0%	30/15	Summer		
5.000	14 60	Winter	30	+0%				
5.001	15 60	Winter	30	+0%	30/15	Summer		
1.005	14 15	Winter	30	+0%	30/15	Summer		
1.006	8 15	Winter	30	+0%	30/15	Summer	100/15	Summer

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Date 21/11/2017 File OUTFALL 900 - Phase 1B.mdx	Designed by S.McLean Checked by	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

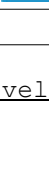
PN	US/MH Name	Water		Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)			
1.000	1	6.330	-0.120	0.000	0.63		37.2	OK		
1.001	2	6.064	-0.151	0.000	0.49		28.8	OK		
1.002	3	5.927	-0.088	0.000	0.47		25.2	OK		
1.003	1	5.905	-0.050	0.000	0.52		29.6	OK		
2.000	10	6.793	-0.087	0.000	0.82		67.0	OK		
2.001	11	6.592	0.022	0.000	0.89		70.5	SURCHARGED		4
2.002	12	6.351	0.121	0.000	0.98		76.3	SURCHARGED		2
2.003	13	6.168	0.168	0.000	0.82		81.4	SURCHARGED		
3.000	6	5.850	0.100	0.000	0.96		11.5	SURCHARGED		
4.000	7	6.198	-0.102	0.000	0.72		42.6	OK		
4.001	8	6.023	-0.042	0.000	0.70		41.0	OK		
4.002	9	6.069	0.184	0.000	0.78		43.4	SURCHARGED		
1.004	7	6.100	0.275	0.000	0.99		66.9	SURCHARGED		
5.000	14	6.117	-0.238	0.000	0.19		20.4	OK		
5.001	15	6.090	0.060	0.000	0.76		20.7	SURCHARGED		
1.005	14	6.125	0.345	0.000	1.17		86.1	SURCHARGED		
1.006	8	6.120	0.416	0.000	0.79		97.9	SURCHARGED		3

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.007	9	15 Winter	30	+0%	30/15 Summer			
1.008	10	15 Winter	30	+0%	1/15 Summer			
6.000	11	15 Winter	30	+0%	100/15 Summer			
7.000	12	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
6.001	13	15 Winter	30	+0%	1/15 Summer			
1.009	14	15 Winter	30	+0%	1/15 Summer			
8.000	15	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.010	16	15 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		Exceeded
1.007	9	6.061	0.461	0.000	1.05		126.8	SURCHARGED	
1.008	10	5.972	0.447	0.000	0.62		138.5	SURCHARGED	
6.000	11	5.897	-0.203	0.000	0.06		20.5	OK	
7.000	12	6.644	0.619	0.000	0.95		39.5	SURCHARGED	4
6.001	13	5.895	0.620	0.000	0.25		73.9	SURCHARGED	
1.009	14	5.880	0.690	0.000	1.90		482.8	SURCHARGED	
8.000	15	6.113	0.513	0.000	1.40		414.2	SURCHARGED	1
1.010	16	5.531	0.331	0.000	0.94		895.1	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for UTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	15 Winter	100	+30%	100/15 Summer			
1.001	2	60 Winter	100	+30%	100/30 Winter			
1.002	3	30 Winter	100	+30%	100/15 Summer			
1.003	1	30 Winter	100	+30%	100/15 Summer			
2.000	10	15 Winter	100	+30%	100/15 Summer			
2.001	11	15 Winter	100	+30%	30/15 Winter	100/15 Summer		
2.002	12	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
2.003	13	15 Winter	100	+30%	30/15 Summer			
3.000	6	120 Winter	100	+30%	30/15 Winter			
4.000	7	30 Winter	100	+30%	100/15 Summer			
4.001	8	30 Winter	100	+30%	100/15 Summer			
4.002	9	30 Winter	100	+30%	30/15 Summer			
1.004	7	15 Summer	100	+30%	30/15 Summer			
5.000	14	60 Winter	100	+30%				
5.001	15	15 Winter	100	+30%	30/15 Summer			
1.005	14	15 Summer	100	+30%	30/15 Summer			
1.006	8	15 Winter	100	+30%	30/15 Summer	100/15 Summer		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 900.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)		Flow (l/s)		
1.000	1	6.491	0.041	0.000	1.04	61.7	SURCHARGED	
1.001	2	6.258	0.043	0.000	0.67	39.3	SURCHARGED	
1.002	3	6.319	0.304	0.000	0.65	34.5	SURCHARGED	
1.003	1	6.319	0.364	0.000	0.79	45.3	SURCHARGED	
2.000	10	7.827	0.947	0.000	1.23	100.5	FLOOD RISK	
2.001	11	7.304	0.734	4.372	1.21	96.7	FLOOD	4
2.002	12	6.930	0.700	0.068	1.32	102.1	FLOOD	2
2.003	13	6.593	0.593	0.000	1.05	103.9	FLOOD RISK	
3.000	6	6.075	0.325	0.000	1.18	14.1	SURCHARGED	
4.000	7	6.506	0.206	0.000	0.93	55.1	SURCHARGED	
4.001	8	6.465	0.400	0.000	0.82	47.9	SURCHARGED	
4.002	9	6.361	0.476	0.000	0.86	48.2	SURCHARGED	
1.004	7	6.453	0.628	0.000	1.45	97.6	FLOOD RISK	
5.000	14	6.268	-0.087	0.000	0.22	24.2	OK	
5.001	15	6.320	0.290	0.000	0.81	22.1	SURCHARGED	
1.005	14	6.578	0.798	0.000	1.56	115.3	FLOOD RISK	
1.006	8	6.696	0.992	15.947	0.98	122.0	FLOOD	3


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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 900.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.007	9	15 Winter	100	+30%	30/15 Summer			
1.008	10	15 Winter	100	+30%	1/15 Summer			
6.000	11	15 Winter	100	+30%	100/15 Summer			
7.000	12	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
6.001	13	15 Winter	100	+30%	1/15 Summer			
1.009	14	15 Winter	100	+30%	1/15 Summer			
8.000	15	15 Winter	100	+30%	30/15 Summer	100/15 Winter		
1.010	16	15 Winter	100	+30%	1/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Overflow (l/s)	Flow (l/s)	Overflow (l/s)		
1.007	9	6.757	1.157	0.000	1.25		150.5		FLOOD	RISK		
1.008	10	6.707	1.182	0.000	0.74		163.2		SURCHARGED			
6.000	11	6.627	0.527	0.000	0.11		38.8		SURCHARGED			
7.000	12	7.305	1.280	4.956	1.12		47.0		FLOOD			4
6.001	13	6.624	1.349	0.000	0.38		110.2		SURCHARGED			
1.009	14	6.600	1.410	0.000	2.85		725.4		SURCHARGED			
8.000	15	7.350	1.750	0.450	2.28		673.6		FLOOD			1
1.010	16	5.838	0.638	0.000	1.46		1399.5		SURCHARGED			

Appendix 7f – Drainage Model Files – Stage 2 ‘Arena’ Area

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Existing Network Details for OUTFALL 1200.SWS

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	51.319	0.200	256.6	0.213	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	54.917	0.260	211.2	0.187	0.00	0.0	0.013	o	450	Pipe/Conduit
2.000	42.272	1.800	23.5	0.098	5.00	0.0	0.013	o	225	Pipe/Conduit
2.001	21.880	0.547	40.0	0.015	0.00	0.0	0.013	o	225	Pipe/Conduit
1.002	90.086	0.210	429.0	0.360	0.00	0.0	0.013	o	525	Pipe/Conduit
1.003	75.701	0.160	473.1	0.319	0.00	0.0	0.013	o	525	Pipe/Conduit
1.004	55.589	0.125	444.7	0.177	0.00	0.0	0.013	o	525	Pipe/Conduit
3.000	56.476	0.540	104.6	0.244	5.00	0.0	0.013	o	300	Pipe/Conduit
4.000	42.000	0.210	200.0	0.158	5.00	0.0	0.013	o	300	Pipe/Conduit
4.001	10.000	0.100	100.0	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
4.002	61.000	0.540	113.0	0.252	5.00	0.0	0.013	o	300	Pipe/Conduit
1.005	59.467	0.105	566.4	0.192	0.00	0.0	0.013	o	525	Pipe/Conduit
5.000	45.627	0.570	80.0	0.134	5.00	0.0	0.013	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.900	0.213	0.0	0.85	60.4
1.001	5.550	0.400	0.0	1.23	196.2
2.000	8.800	0.098	0.0	2.33	92.7
2.001	7.000	0.113	0.0	1.79	71.0
1.002	5.290	0.873	0.0	0.96	207.6
1.003	5.080	1.192	0.0	0.91	197.7
1.004	4.920	1.369	0.0	0.94	203.9
3.000	5.590	0.244	0.0	1.34	94.6
4.000	5.900	0.158	0.0	0.97	68.4
4.001	5.690	0.158	0.0	1.37	96.7
4.002	5.590	0.410	0.0	1.29	91.0
1.005	4.795	2.215	0.0	0.83	180.7
5.000	5.560	0.134	0.0	1.53	108.1


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.006	50.475	0.200	252.4	0.065	0.00	0.0	0.013	o	600	Pipe/Conduit
1.007	22.365	0.050	447.3	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit
1.008	90.568	0.229	395.5	0.000	0.00	0.0	0.013	o	600	Pipe/Conduit
6.000	17.500	0.220	79.5	0.555	5.00	0.0	0.013	o	375	Pipe/Conduit
6.001	47.600	0.100	476.0	0.303	0.00	0.0	0.013	o	450	Pipe/Conduit
7.000	74.000	0.514	144.0	0.517	5.00	0.0	0.013	o	375	Pipe/Conduit
1.009	11.002	0.031	354.9	0.000	0.00	0.0	0.013	o	675	Pipe/Conduit
1.010	109.581	0.300	365.3	0.200	0.00	0.0	0.013	o	750	Pipe/Conduit
8.000	47.126	0.270	174.5	0.192	5.00	0.0	0.013	o	300	Pipe/Conduit
9.000	18.670	0.107	174.5	0.415	5.00	0.0	0.013	o	375	Pipe/Conduit
10.000	49.508	0.330	150.0	0.089	5.00	0.0	0.013	o	300	Pipe/Conduit
10.001	49.508	0.330	150.0	0.089	0.00	0.0	0.013	o	300	Pipe/Conduit
11.000	39.863	0.360	110.7	0.078	5.00	0.0	0.013	o	300	Pipe/Conduit
10.002	11.304	0.515	21.9	0.091	0.00	0.0	0.013	o	450	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.006	4.690	2.414	0.0	1.37	386.5
1.007	4.490	2.414	0.0	1.03	290.3
1.008	4.440	2.414	0.0	1.09	308.7
6.000	6.325	0.555	0.0	1.78	196.6
6.001	6.030	0.858	0.0	0.82	130.7
7.000	6.325	0.517	0.0	1.32	146.1
1.009	4.211	3.789	0.0	1.25	446.2
1.010	4.180	3.989	0.0	1.32	582.5
8.000	5.700	0.192	0.0	1.04	73.2
9.000	5.507	0.415	0.0	1.20	132.7
10.000	6.300	0.089	0.0	1.12	78.9
10.001	5.970	0.178	0.0	1.12	78.9
11.000	6.000	0.078	0.0	1.30	91.9
10.002	5.640	0.347	0.0	3.83	608.5


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
8.001	42.561	0.225	189.2	0.333	0.00	0.0	0.013	o	525	Pipe/Conduit
12.000	46.151	0.310	148.9	0.138	5.00	0.0	0.013	o	300	Pipe/Conduit
12.001	46.150	0.310	148.9	0.074	0.00	0.0	0.013	o	300	Pipe/Conduit
12.002	30.048	0.200	150.0	0.074	0.00	0.0	0.013	o	300	Pipe/Conduit
12.003	10.000#	0.480	20.8	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
8.002	23.568	0.055	428.5	0.086	0.00	0.0	0.013	o	600	Pipe/Conduit
13.000	97.657	3.100	31.5	0.785	5.00	0.0	0.013	o	375	Pipe/Conduit
8.003	49.095	0.110	446.3	0.099	0.00	0.0	0.013	o	600	Pipe/Conduit
8.004	43.039	0.085	506.3	0.921	0.00	0.0	0.013	o	600	Pipe/Conduit
8.005	15.640	0.040	391.0	1.047	0.00	0.0	0.013	o	600	Pipe/Conduit
1.011	151.065	0.302	500.2	0.409	0.00	0.0	0.013	o	750	Pipe/Conduit
14.000	86.676	1.445	60.0	1.520	5.00	0.0	0.013	o	600	Pipe/Conduit
14.001	67.726	2.255	30.0	1.000	0.00	0.0	0.013	o	600	Pipe/Conduit
14.002	53.592	0.200	268.0	0.443	0.00	0.0	0.013	o	750	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
8.001	5.000	1.287	0.0	1.44	312.7
12.000	6.300	0.138	0.0	1.12	79.3
12.001	5.990	0.212	0.0	1.12	79.3
12.002	5.680	0.286	0.0	1.12	79.0
12.003	5.480	0.286	0.0	3.00	211.9
8.002	4.700	1.659	0.0	1.05	296.6
13.000	8.000	0.785	0.0	2.83	312.4
8.003	4.645	2.543	0.0	1.03	290.6
8.004	4.535	3.464	0.0	0.97	272.9
8.005	4.450	4.511	0.0	1.10	310.5
1.011	3.880	8.909	0.0	1.13	497.8
14.000	8.000	1.520	0.0	2.80	792.7
14.001	6.555	2.520	0.0	3.96	1120.4
14.002	4.150	2.963	0.0	1.54	680.1


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Existing Network Details for OUTFALL 1200.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.012	6.892	0.100	68.9	0.000	0.00	0.0	0.013	o	1200	Pipe/Conduit


Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.012	3.100	11.872	0.0	4.15	4696.2

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Manhole Schedules for OUTFALL 1200.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.770	0.870	Open Manhole	1200	1.000	5.900	300				
2	7.210	1.660	Open Manhole	1350	1.001	5.550	450	1.000	5.700	300	
20	10.000	1.200	Open Manhole	1200	2.000	8.800	225				
21	8.500	1.500	Open Manhole	1200	2.001	7.000	225	2.000	7.000	225	
3	7.440	2.150	Open Manhole	1500	1.002	5.290	525	1.001	5.290	450	
								2.001	6.453	225	863
4	7.160	2.080	Open Manhole	1500	1.003	5.080	525	1.002	5.080	525	
5	7.110	2.190	Open Manhole	1500	1.004	4.920	525	1.003	4.920	525	
30	8.010	2.420	Open Manhole	1200	3.000	5.590	300				
11	7.200	1.300	Open Manhole	1200	4.000	5.900	300				
12	7.200	1.510	Open Manhole	1200	4.001	5.690	300	4.000	5.690	300	
40	7.200	1.610	Open Manhole	1200	4.002	5.590	300	4.001	5.590	300	
6	7.470	2.675	Open Manhole	1500	1.005	4.795	525	1.004	4.795	525	
								3.000	5.050	300	30
								4.002	5.050	300	30
50	7.660	2.100	Open Manhole	1200	5.000	5.560	300				
7	8.300	3.610	Open Manhole	1500	1.006	4.690	600	1.005	4.690	525	
								5.000	4.990	300	
13	7.630	3.140	Open Manhole	2100	1.007	4.490	600	1.006	4.490	600	
8	7.100	2.660	Open Manhole	1800	1.008	4.440	600	1.007	4.440	600	
60	7.900	1.575	Open Manhole	1200	6.000	6.325	375				
61	7.900	1.870	Open Manhole	1200	6.001	6.030	450	6.000	6.105	375	
70	7.900	1.575	Open Manhole	1350	7.000	6.325	375				
9	7.900	3.689	Open Manhole	1800	1.009	4.211	675	1.008	4.211	600	
								6.001	5.930	450	1494
								7.000	5.811	375	1300
10	7.260	3.080	Open Manhole	1800	1.010	4.180	750	1.009	4.180	675	
80	7.470	1.770	Open Manhole	1200	8.000	5.700	300				
90	7.310	1.803	Open Manhole	1350	9.000	5.507	375				
24	7.600	1.300	Open Manhole	1200	10.000	6.300	300				
25	7.600	1.630	Open Manhole	1200	10.001	5.970	300	10.000	5.970	300	
26	7.300	1.300	Open Manhole	1200	11.000	6.000	300				
27	7.300	1.660	Open Manhole	1200	10.002	5.640	450	10.001	5.640	300	
								11.000	5.640	300	
81	7.200	2.200	Open Manhole	1350	8.001	5.000	525	8.000	5.430	300	205
								9.000	5.400	375	250
								10.002	5.125	450	50
29	7.600	1.300	Open Manhole	1200	12.000	6.300	300				

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Manhole Schedules for OUTFALL 1200.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
30	7.600	1.610	Open Manhole	1200	12.001	5.990	300	12.000	5.990	300	
31	7.600	1.920	Open Manhole	1200	12.002	5.680	300	12.001	5.680	300	
32	8.000	2.520	Open Manhole	1200	12.003	5.480	300	12.002	5.480	300	
82	7.840	3.140	Open Manhole	1500	8.002	4.700	600	8.001	4.775	525	
								12.003	5.000	300	
100	10.000	2.000	Open Manhole	1200	13.000	8.000	375				
83	8.070	3.425	Open Manhole	1500	8.003	4.645	600	8.002	4.645	600	
								13.000	4.900	375	30
84	7.960	3.425	Open Manhole	1500	8.004	4.535	600	8.003	4.535	600	
85	7.960	3.510	Open Manhole	1500	8.005	4.450	600	8.004	4.450	600	
11	7.340	3.460	Open Manhole	1800	1.011	3.880	750	1.010	3.880	750	
								8.005	4.410	600	380
110	10.000	2.000	Open Manhole	1500	14.000	8.000	600				
111	8.500	1.945	Open Manhole	1500	14.001	6.555	600	14.000	6.555	600	
112	7.500	3.350	Open Manhole	1800	14.002	4.150	750	14.001	4.300	600	
12	7.500	4.400	Open Manhole	2200	1.012	3.100	1200	1.011	3.578	750	28
								14.002	3.950	750	400
13	7.500	4.500	Open Manhole	0		OUTFALL		1.012	3.000	1200	

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PIPELINE SCHEDULES for OUTFALL 1200.SWS


Upstream Manhole

- Indicates pipe length does not match coordinates

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	6.770	5.900	0.570	Open Manhole	1200
1.001	o	450	2	7.210	5.550	1.210	Open Manhole	1350
2.000	o	225	20	10.000	8.800	0.975	Open Manhole	1200
2.001	o	225	21	8.500	7.000	1.275	Open Manhole	1200
1.002	o	525	3	7.440	5.290	1.625	Open Manhole	1500
1.003	o	525	4	7.160	5.080	1.555	Open Manhole	1500
1.004	o	525	5	7.110	4.920	1.665	Open Manhole	1500
3.000	o	300	30	8.010	5.590	2.120	Open Manhole	1200
4.000	o	300	11	7.200	5.900	1.000	Open Manhole	1200
4.001	o	300	12	7.200	5.690	1.210	Open Manhole	1200
4.002	o	300	40	7.200	5.590	1.310	Open Manhole	1200
1.005	o	525	6	7.470	4.795	2.150	Open Manhole	1500
5.000	o	300	50	7.660	5.560	1.800	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)
1.000	51.319	256.6	2	7.210	5.700	1.210	Open Manhole	1350
1.001	54.917	211.2	3	7.440	5.290	1.700	Open Manhole	1500
2.000	42.272	23.5	21	8.500	7.000	1.275	Open Manhole	1200
2.001	21.880	40.0	3	7.440	6.453	0.762	Open Manhole	1500
1.002	90.086	429.0	4	7.160	5.080	1.555	Open Manhole	1500
1.003	75.701	473.1	5	7.110	4.920	1.665	Open Manhole	1500
1.004	55.589	444.7	6	7.470	4.795	2.150	Open Manhole	1500
3.000	56.476	104.6	6	7.470	5.050	2.120	Open Manhole	1500
4.000	42.000	200.0	12	7.200	5.690	1.210	Open Manhole	1200
4.001	10.000	100.0	40	7.200	5.590	1.310	Open Manhole	1200
4.002	61.000	113.0	6	7.470	5.050	2.120	Open Manhole	1500
1.005	59.467	566.4	7	8.300	4.690	3.085	Open Manhole	1500
5.000	45.627	80.0	7	8.300	4.990	3.010	Open Manhole	1500

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PIPELINE SCHEDULES for OUTFALL 1200.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	600	7	8.300	4.690	3.010	Open Manhole	1500
1.007	o	600	13	7.630	4.490	2.540	Open Manhole	2100
1.008	o	600	8	7.100	4.440	2.060	Open Manhole	1800
6.000	o	375	60	7.900	6.325	1.200	Open Manhole	1200
6.001	o	450	61	7.900	6.030	1.420	Open Manhole	1200
7.000	o	375	70	7.900	6.325	1.200	Open Manhole	1350
1.009	o	675	9	7.900	4.211	3.014	Open Manhole	1800
1.010	o	750	10	7.260	4.180	2.330	Open Manhole	1800
8.000	o	300	80	7.470	5.700	1.470	Open Manhole	1200
9.000	o	375	90	7.310	5.507	1.428	Open Manhole	1350
10.000	o	300	24	7.600	6.300	1.000	Open Manhole	1200
10.001	o	300	25	7.600	5.970	1.330	Open Manhole	1200
11.000	o	300	26	7.300	6.000	1.000	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)
1.006	50.475	252.4	13	7.630	4.490	2.540	Open Manhole	2100
1.007	22.365	447.3	8	7.100	4.440	2.060	Open Manhole	1800
1.008	90.568	395.5	9	7.900	4.211	3.089	Open Manhole	1800
6.000	17.500	79.5	61	7.900	6.105	1.420	Open Manhole	1200
6.001	47.600	476.0	9	7.900	5.930	1.520	Open Manhole	1800
7.000	74.000	144.0	9	7.900	5.811	1.714	Open Manhole	1800
1.009	11.002	354.9	10	7.260	4.180	2.405	Open Manhole	1800
1.010	109.581	365.3	11	7.340	3.880	2.710	Open Manhole	1800
8.000	47.126	174.5	81	7.200	5.430	1.470	Open Manhole	1350
9.000	18.670	174.5	81	7.200	5.400	1.425	Open Manhole	1350
10.000	49.508	150.0	25	7.600	5.970	1.330	Open Manhole	1200
10.001	49.508	150.0	27	7.300	5.640	1.360	Open Manhole	1200
11.000	39.863	110.7	27	7.300	5.640	1.360	Open Manhole	1200

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PIPELINE SCHEDULES for OUTFALL 1200.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)
10.002	o	450	27	7.300	5.640	1.210	Open Manhole	1200
8.001	o	525	81	7.200	5.000	1.675	Open Manhole	1350
12.000	o	300	29	7.600	6.300	1.000	Open Manhole	1200
12.001	o	300	30	7.600	5.990	1.310	Open Manhole	1200
12.002	o	300	31	7.600	5.680	1.620	Open Manhole	1200
12.003	o	300	32	8.000	5.480	2.220	Open Manhole	1200
8.002	o	600	82	7.840	4.700	2.540	Open Manhole	1500
13.000	o	375	100	10.000	8.000	1.625	Open Manhole	1200
8.003	o	600	83	8.070	4.645	2.825	Open Manhole	1500
8.004	o	600	84	7.960	4.535	2.825	Open Manhole	1500
8.005	o	600	85	7.960	4.450	2.910	Open Manhole	1500
1.011	o	750	11	7.340	3.880	2.710	Open Manhole	1800
14.000	o	600	110	10.000	8.000	1.400	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)
10.002	11.304	21.9	81	7.200	5.125	1.625	Open Manhole	1350
8.001	42.561	189.2	82	7.840	4.775	2.540	Open Manhole	1500
12.000	46.151	148.9	30	7.600	5.990	1.310	Open Manhole	1200
12.001	46.150	148.9	31	7.600	5.680	1.620	Open Manhole	1200
12.002	30.048	150.0	32	8.000	5.480	2.220	Open Manhole	1200
12.003	10.000#	20.8	82	7.840	5.000	2.540	Open Manhole	1500
8.002	23.568	428.5	83	8.070	4.645	2.825	Open Manhole	1500
13.000	97.657	31.5	83	8.070	4.900	2.795	Open Manhole	1500
8.003	49.095	446.3	84	7.960	4.535	2.825	Open Manhole	1500
8.004	43.039	506.3	85	7.960	4.450	2.910	Open Manhole	1500
8.005	15.640	391.0	11	7.340	4.410	2.330	Open Manhole	1800
1.011	151.065	500.2	12	7.500	3.578	3.172	Open Manhole	2200
14.000	86.676	60.0	111	8.500	6.555	1.345	Open Manhole	1500

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PIPELINE SCHEDULES for OUTFALL 1200.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)
14.001	o	600	111	8.500	6.555	1.345	Open Manhole	1500
14.002	o	750	112	7.500	4.150	2.600	Open Manhole	1800
1.012	o	1200	12	7.500	3.100	3.200	Open Manhole	2200

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)
14.001	67.726	30.0	112	7.500	4.300	2.600	Open Manhole	1800
14.002	53.592	268.0	12	7.500	3.950	2.800	Open Manhole	2200
1.012	6.892	68.9	13	7.500	3.000	3.300	Open Manhole	0


Surcharged Outfall Details for OUTFALL 1200.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.012	13	7.500	3.000	3.000	0	0
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Datum (m) 3.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	2.250	19	2.250	37	2.250	55	2.250	73	2.250	91	2.250
2	2.250	20	2.250	38	2.250	56	2.250	74	2.250	92	2.250
3	2.250	21	2.250	39	2.250	57	2.250	75	2.250	93	2.250
4	2.250	22	2.250	40	2.250	58	2.250	76	2.250	94	2.250
5	2.250	23	2.250	41	2.250	59	2.250	77	2.250	95	2.250
6	2.250	24	2.250	42	2.250	60	2.250	78	2.250	96	2.250
7	2.250	25	2.250	43	2.250	61	2.250	79	2.250	97	2.250
8	2.250	26	2.250	44	2.250	62	2.250	80	2.250	98	2.250
9	2.250	27	2.250	45	2.250	63	2.250	81	2.250	99	2.250
10	2.250	28	2.250	46	2.250	64	2.250	82	2.250	100	2.250
11	2.250	29	2.250	47	2.250	65	2.250	83	2.250	101	2.250
12	2.250	30	2.250	48	2.250	66	2.250	84	2.250	102	2.250
13	2.250	31	2.250	49	2.250	67	2.250	85	2.250	103	2.250
14	2.250	32	2.250	50	2.250	68	2.250	86	2.250	104	2.250
15	2.250	33	2.250	51	2.250	69	2.250	87	2.250	105	2.250
16	2.250	34	2.250	52	2.250	70	2.250	88	2.250	106	2.250
17	2.250	35	2.250	53	2.250	71	2.250	89	2.250	107	2.250
18	2.250	36	2.250	54	2.250	72	2.250	90	2.250	108	2.250

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Surcharged Outfall Details for OUTFALL 1200.SWS

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
109	2.250	131	2.250	153	2.250	175	2.250	197	2.250	219	2.250
110	2.250	132	2.250	154	2.250	176	2.250	198	2.250	220	2.250
111	2.250	133	2.250	155	2.250	177	2.250	199	2.250	221	2.250
112	2.250	134	2.250	156	2.250	178	2.250	200	2.250	222	2.250
113	2.250	135	2.250	157	2.250	179	2.250	201	2.250	223	2.250
114	2.250	136	2.250	158	2.250	180	2.250	202	2.250	224	2.250
115	2.250	137	2.250	159	2.250	181	2.250	203	2.250	225	2.250
116	2.250	138	2.250	160	2.250	182	2.250	204	2.250	226	2.250
117	2.250	139	2.250	161	2.250	183	2.250	205	2.250	227	2.250
118	2.250	140	2.250	162	2.250	184	2.250	206	2.250	228	2.250
119	2.250	141	2.250	163	2.250	185	2.250	207	2.250	229	2.250
120	2.250	142	2.250	164	2.250	186	2.250	208	2.250	230	2.250
121	2.250	143	2.250	165	2.250	187	2.250	209	2.250	231	2.250
122	2.250	144	2.250	166	2.250	188	2.250	210	2.250	232	2.250
123	2.250	145	2.250	167	2.250	189	2.250	211	2.250	233	2.250
124	2.250	146	2.250	168	2.250	190	2.250	212	2.250	234	2.250
125	2.250	147	2.250	169	2.250	191	2.250	213	2.250	235	2.250
126	2.250	148	2.250	170	2.250	192	2.250	214	2.250	236	2.250
127	2.250	149	2.250	171	2.250	193	2.250	215	2.250	237	2.250
128	2.250	150	2.250	172	2.250	194	2.250	216	2.250	238	2.250
129	2.250	151	2.250	173	2.250	195	2.250	217	2.250	239	2.250
130	2.250	152	2.250	174	2.250	196	2.250	218	2.250	240	2.250


Simulation Criteria for OUTFALL 1200.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 Storage Structures	8
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Storage Structures for OUTFALL 1200.SWS

Cellular Storage Manhole: 2, DS/PN: 1.001

Invert Level (m) 5.500 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)
0.000	120.0	120.0	1.300	0.0	166.0
0.100	120.0	124.4	1.400	0.0	166.0
0.200	120.0	128.8	1.500	0.0	166.0
0.300	120.0	133.1	1.600	0.0	166.0
0.400	120.0	137.5	1.700	0.0	166.0
0.500	120.0	141.9	1.800	0.0	166.0
0.600	120.0	146.3	1.900	0.0	166.0
0.700	120.0	150.7	2.000	0.0	166.0
0.800	120.0	155.1	2.100	0.0	166.0
0.900	120.0	159.4	2.200	0.0	166.0
1.000	120.0	163.8	2.300	0.0	166.0
1.100	0.0	166.0	2.400	0.0	166.0
1.200	0.0	166.0	2.500	0.0	166.0


Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 5.100 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)
0.000	395.0	345.0	1.300	0.0	423.0
0.100	395.0	352.4	1.400	0.0	423.0
0.200	395.0	359.9	1.500	0.0	423.0
0.300	395.0	367.3	1.600	0.0	423.0
0.400	395.0	374.7	1.700	0.0	423.0
0.500	395.0	382.1	1.800	0.0	423.0
0.600	395.0	389.6	1.900	0.0	423.0
0.700	395.0	397.0	2.000	0.0	423.0
0.800	395.0	404.4	2.100	0.0	423.0
0.900	395.0	411.9	2.200	0.0	423.0
1.000	395.0	419.3	2.300	0.0	423.0
1.100	0.0	423.0	2.400	0.0	423.0
1.200	0.0	423.0	2.500	0.0	423.0

Cellular Storage Manhole: 5, DS/PN: 1.004

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: 5, DS/PN: 1.004

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	140.0	140.0	1.300	0.0	189.7
0.100	140.0	144.7	1.400	0.0	189.7
0.200	140.0	149.5	1.500	0.0	189.7
0.300	140.0	154.2	1.600	0.0	189.7
0.400	140.0	158.9	1.700	0.0	189.7
0.500	140.0	163.7	1.800	0.0	189.7
0.600	140.0	168.4	1.900	0.0	189.7
0.700	140.0	173.1	2.000	0.0	189.7
0.800	140.0	177.9	2.100	0.0	189.7
0.900	140.0	182.6	2.200	0.0	189.7
1.000	140.0	187.3	2.300	0.0	189.7
1.100	0.0	189.7	2.400	0.0	189.7
1.200	0.0	189.7	2.500	0.0	189.7

Cellular Storage Manhole: 40, DS/PN: 4.002


Invert Level (m) 5.590 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)
0.000	440.0	440.0	1.300	0.0	528.1
0.100	440.0	448.4	1.400	0.0	528.1
0.200	440.0	456.8	1.500	0.0	528.1
0.300	440.0	465.2	1.600	0.0	528.1
0.400	440.0	473.6	1.700	0.0	528.1
0.500	440.0	482.0	1.800	0.0	528.1
0.600	440.0	490.3	1.900	0.0	528.1
0.700	440.0	498.7	2.000	0.0	528.1
0.800	440.0	507.1	2.100	0.0	528.1
0.900	440.0	515.5	2.200	0.0	528.1
1.000	440.0	523.9	2.300	0.0	528.1
1.100	0.0	528.1	2.400	0.0	528.1
1.200	0.0	528.1	2.500	0.0	528.1

Cellular Storage Manhole: 25, DS/PN: 10.001

Invert Level (m) 6.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	330.0	330.0	0.600	330.0	373.6
0.100	330.0	337.3	0.700	330.0	380.9
0.200	330.0	344.5	0.800	330.0	388.1
0.300	330.0	351.8	0.900	330.0	395.4
0.400	330.0	359.1	1.000	330.0	402.7
0.500	330.0	366.3	1.100	0.0	406.3

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Cellular Storage Manhole: 25, DS/PN: 10.001

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
1.200	0.0	406.3	1.900	0.0	406.3
1.300	0.0	406.3	2.000	0.0	406.3
1.400	0.0	406.3	2.100	0.0	406.3
1.500	0.0	406.3	2.200	0.0	406.3
1.600	0.0	406.3	2.300	0.0	406.3
1.700	0.0	406.3	2.400	0.0	406.3
1.800	0.0	406.3	2.500	0.0	406.3

Cellular Storage Manhole: 27, DS/PN: 10.002


Invert Level (m) 5.640 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
Infiltration Coefficient Side (m/hr) 0.00000

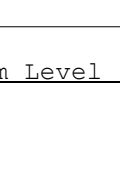
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	150.0	150.0	1.300	0.0	201.4
0.100	150.0	154.9	1.400	0.0	201.4
0.200	150.0	159.8	1.500	0.0	201.4
0.300	150.0	164.7	1.600	0.0	201.4
0.400	150.0	169.6	1.700	0.0	201.4
0.500	150.0	174.5	1.800	0.0	201.4
0.600	150.0	179.4	1.900	0.0	201.4
0.700	150.0	184.3	2.000	0.0	201.4
0.800	150.0	189.2	2.100	0.0	201.4
0.900	150.0	194.1	2.200	0.0	201.4
1.000	150.0	199.0	2.300	0.0	201.4
1.100	0.0	201.4	2.400	0.0	201.4
1.200	0.0	201.4	2.500	0.0	201.4

Cellular Storage Manhole: 30, DS/PN: 12.001

Invert Level (m) 6.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	250.0	250.0	1.200	0.0	316.4
0.100	250.0	256.3	1.300	0.0	316.4
0.200	250.0	262.6	1.400	0.0	316.4
0.300	250.0	269.0	1.500	0.0	316.4
0.400	250.0	275.3	1.600	0.0	316.4
0.500	250.0	281.6	1.700	0.0	316.4
0.600	250.0	287.9	1.800	0.0	316.4
0.700	250.0	294.3	1.900	0.0	316.4
0.800	250.0	300.6	2.000	0.0	316.4
0.900	250.0	306.9	2.100	0.0	316.4
1.000	250.0	313.2	2.200	0.0	316.4
1.100	0.0	316.4	2.300	0.0	316.4

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XP Solutions	Network 2017.1.2																																																																																																	
<p><u>Cellular Storage Manhole: 30, DS/PN: 12.001</u></p> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>2.400</td><td>0.0</td><td>316.4</td><td>2.500</td><td>0.0</td><td>316.4</td></tr></table> <p><u>Cellular Storage Manhole: 32, DS/PN: 12.003</u></p> <p>Invert Level (m) 5.480 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97 Infiltration Coefficient Side (m/hr) 0.00000</p> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>100.0</td><td>100.0</td><td>1.300</td><td>0.0</td><td>142.0</td></tr><tr><td>0.100</td><td>100.0</td><td>104.0</td><td>1.400</td><td>0.0</td><td>142.0</td></tr><tr><td>0.200</td><td>100.0</td><td>108.0</td><td>1.500</td><td>0.0</td><td>142.0</td></tr><tr><td>0.300</td><td>100.0</td><td>112.0</td><td>1.600</td><td>0.0</td><td>142.0</td></tr><tr><td>0.400</td><td>100.0</td><td>116.0</td><td>1.700</td><td>0.0</td><td>142.0</td></tr><tr><td>0.500</td><td>100.0</td><td>120.0</td><td>1.800</td><td>0.0</td><td>142.0</td></tr><tr><td>0.600</td><td>100.0</td><td>124.0</td><td>1.900</td><td>0.0</td><td>142.0</td></tr><tr><td>0.700</td><td>100.0</td><td>128.0</td><td>2.000</td><td>0.0</td><td>142.0</td></tr><tr><td>0.800</td><td>100.0</td><td>132.0</td><td>2.100</td><td>0.0</td><td>142.0</td></tr><tr><td>0.900</td><td>100.0</td><td>136.0</td><td>2.200</td><td>0.0</td><td>142.0</td></tr><tr><td>1.000</td><td>100.0</td><td>140.0</td><td>2.300</td><td>0.0</td><td>142.0</td></tr><tr><td>1.100</td><td>0.0</td><td>142.0</td><td>2.400</td><td>0.0</td><td>142.0</td></tr><tr><td>1.200</td><td>0.0</td><td>142.0</td><td>2.500</td><td>0.0</td><td>142.0</td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	2.400	0.0	316.4	2.500	0.0	316.4	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	100.0	100.0	1.300	0.0	142.0	0.100	100.0	104.0	1.400	0.0	142.0	0.200	100.0	108.0	1.500	0.0	142.0	0.300	100.0	112.0	1.600	0.0	142.0	0.400	100.0	116.0	1.700	0.0	142.0	0.500	100.0	120.0	1.800	0.0	142.0	0.600	100.0	124.0	1.900	0.0	142.0	0.700	100.0	128.0	2.000	0.0	142.0	0.800	100.0	132.0	2.100	0.0	142.0	0.900	100.0	136.0	2.200	0.0	142.0	1.000	100.0	140.0	2.300	0.0	142.0	1.100	0.0	142.0	2.400	0.0	142.0	1.200	0.0	142.0	2.500	0.0	142.0
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																																													
2.400	0.0	316.4	2.500	0.0	316.4																																																																																													
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																																													
0.000	100.0	100.0	1.300	0.0	142.0																																																																																													
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1.000	100.0	140.0	2.300	0.0	142.0																																																																																													
1.100	0.0	142.0	2.400	0.0	142.0																																																																																													
1.200	0.0	142.0	2.500	0.0	142.0																																																																																													
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.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 Storage Structures	8
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.001	2	30 Winter	1	+0%	100/15 Summer			
2.000	20	15 Winter	1	+0%				
2.001	21	15 Winter	1	+0%				
1.002	3	30 Winter	1	+0%	30/120 Winter			
1.003	4	240 Winter	1	+0%	30/30 Summer			
1.004	5	240 Winter	1	+0%	30/15 Summer			
3.000	30	15 Winter	1	+0%	30/15 Summer			
4.000	11	15 Winter	1	+0%	100/15 Summer			
4.001	12	15 Winter	1	+0%	100/30 Summer			
4.002	40	60 Winter	1	+0%	100/15 Summer			
1.005	6	30 Winter	1	+0%	1/15 Summer			
5.000	50	15 Winter	1	+0%	30/15 Summer			
1.006	7	15 Winter	1	+0%	1/15 Summer			
1.007	13	15 Winter	1	+0%	1/15 Summer			
1.008	8	15 Summer	1	+0%	1/15 Summer	100/15 Summer		
6.000	60	15 Winter	1	+0%	30/15 Summer	100/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.053	-0.147	0.000	0.51		29.2	OK			2
1.001	2	5.662	-0.338	0.000	0.14		25.7	OK			
2.000	20	8.859	-0.166	0.000	0.15		13.4	OK			
2.001	21	7.074	-0.151	0.000	0.23		15.2	OK			
1.002	3	5.489	-0.326	0.000	0.30		58.2	OK			
1.003	4	5.414	-0.191	0.000	0.32		58.9	OK			
1.004	5	5.393	-0.052	0.000	0.52		97.8	OK			
3.000	30	5.718	-0.172	0.000	0.38		34.1	OK			
4.000	11	6.021	-0.179	0.000	0.33		21.4	OK			
4.001	12	5.795	-0.195	0.000	0.27		21.4	OK			
4.002	40	5.660	-0.230	0.000	0.12		10.8	OK			
1.005	6	5.452	0.132	0.000	0.25		42.2	SURCHARGED			
5.000	50	5.646	-0.214	0.000	0.18		18.5	OK			
1.006	7	5.572	0.282	0.000	0.19		65.3	SURCHARGED			
1.007	13	5.628	0.538	0.000	0.20		47.5	SURCHARGED			
1.008	8	5.748	0.708	0.000	0.08		22.8	SURCHARGED			4
6.000	60	6.505	-0.195	0.000	0.46		76.6	OK			4

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
7.000	70 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
1.009	9 15	Summer	1	+0%	1/15 Summer			
1.010	10 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
8.000	80 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
9.000	90 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
10.000	24 15	Winter	1	+0%	100/30 Winter			
10.001	25 30	Winter	1	+0%	100/15 Summer			
11.000	26 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
10.002	27 30	Winter	1	+0%	30/15 Summer	100/15 Summer		
8.001	81 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
12.000	29 15	Winter	1	+0%	100/15 Winter			
12.001	30 60	Winter	1	+0%	100/15 Summer			
12.002	31 30	Winter	1	+0%	30/15 Summer			
12.003	32 15	Winter	1	+0%	30/15 Summer			
8.002	82 15	Summer	1	+0%	1/15 Summer			
13.000	100 15	Winter	1	+0%	30/15 Summer	100/15 Summer		
8.003	83 15	Summer	1	+0%	1/15 Summer			
8.004	84 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
8.005	85 15	Winter	1	+0%	1/15 Summer	100/15 Summer		
1.011	11 15	Winter	1	+0%	1/15 Summer			
14.000	110 15	Winter	1	+0%	100/15 Summer			
14.001	111 15	Winter	1	+0%	100/15 Summer	100/15 Summer		
14.002	112 15	Summer	1	+0%	1/15 Summer			
1.012	12 15	Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Flow (l/s)	Flow (l/s)	Flow (l/s)		
6.001	61	6.373	-0.107	0.000	0.93		112.0				OK	
7.000	70	6.517	-0.183	0.000	0.51		72.0				OK	4
1.009	9	5.923	1.037	0.000	0.52		142.2				SURCHARGED	
1.010	10	5.738	0.808	0.000	0.20		109.2				SURCHARGED	4
8.000	80	5.968	-0.032	0.000	0.39		26.9				OK	4
9.000	90	6.018	0.136	0.000	0.50		56.8				SURCHARGED	6
10.000	24	6.382	-0.218	0.000	0.16		12.0				OK	
10.001	25	6.027	-0.243	0.000	0.08		6.1				OK	
11.000	26	6.071	-0.229	0.000	0.12		10.7				OK	3
10.002	27	5.750	-0.340	0.000	0.11		42.7				OK	1
8.001	81	5.920	0.395	0.000	0.42		118.2				SURCHARGED	6
12.000	29	6.403	-0.197	0.000	0.25		18.9				OK	
12.001	30	6.051	-0.239	0.000	0.09		7.1				OK	
12.002	31	5.758	-0.222	0.000	0.15		11.1				OK	
12.003	32	5.586	-0.194	0.000	0.20		34.1				OK	
8.002	82	5.887	0.587	0.000	0.36		87.7				SURCHARGED	
13.000	100	8.156	-0.219	0.000	0.35		107.1				OK	4

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		Exceeded
8.003	83	5.959	0.714	0.000	0.64		167.3	SURCHARGED	
8.004	84	5.769	0.634	0.000	0.83		199.3	SURCHARGED	2
8.005	85	5.690	0.640	0.000	1.53		319.2	SURCHARGED	1
1.011	11	5.706	1.076	0.000	0.65		309.5	SURCHARGED	
14.000	110	8.219	-0.381	0.000	0.28		207.8	OK	
14.001	111	6.781	-0.374	0.000	0.31		315.7	OK	2
14.002	112	5.606	0.706	0.000	0.54		320.6	SURCHARGED	
1.012	12	5.518	1.218	0.000	0.29		566.3	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 1200.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /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 Storage Structures	8
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.001	2	120 Winter	30	+0%	100/15 Summer			
2.000	20	15 Winter	30	+0%				
2.001	21	15 Winter	30	+0%				
1.002	3	120 Winter	30	+0%	30/120 Winter			
1.003	4	120 Winter	30	+0%	30/30 Summer			
1.004	5	120 Winter	30	+0%	30/15 Summer			
3.000	30	15 Winter	30	+0%	30/15 Summer			
4.000	11	15 Winter	30	+0%	100/15 Summer			
4.001	12	15 Winter	30	+0%	100/30 Summer			
4.002	40	60 Winter	30	+0%	100/15 Summer			
1.005	6	15 Summer	30	+0%	1/15 Summer			
5.000	50	15 Winter	30	+0%	30/15 Summer			
1.006	7	15 Winter	30	+0%	1/15 Summer			
1.007	13	15 Winter	30	+0%	1/15 Summer			
1.008	8	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
6.000	60	15 Winter	30	+0%	30/15 Summer	100/15 Summer		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		
1.000	1	6.279	0.079	0.000	1.17		67.8	SURCHARGED	2
1.001	2	5.856	-0.144	0.000	0.22		39.4	OK	
2.000	20	8.896	-0.129	0.000	0.37		33.1	OK	
2.001	21	7.125	-0.100	0.000	0.58		38.1	OK	
1.002	3	5.834	0.019	0.000	0.42		83.4	SURCHARGED	
1.003	4	5.815	0.210	0.000	0.27		51.0	SURCHARGED	
1.004	5	5.793	0.348	0.000	0.33		62.5	SURCHARGED	
3.000	30	6.529	0.639	0.000	0.83		75.0	SURCHARGED	
4.000	11	6.112	-0.088	0.000	0.81		52.6	OK	
4.001	12	5.868	-0.122	0.000	0.66		52.2	OK	
4.002	40	5.799	-0.091	0.000	0.50		44.2	OK	
1.005	6	6.162	0.842	0.000	0.44		74.2	SURCHARGED	
5.000	50	6.574	0.714	0.000	0.39		40.0	SURCHARGED	
1.006	7	6.433	1.143	0.000	0.22		75.6	SURCHARGED	
1.007	13	6.514	1.424	0.000	0.28		65.7	SURCHARGED	
1.008	8	6.548	1.508	0.000	0.22		63.4	SURCHARGED	4
6.000	60	7.229	0.529	0.000	1.02		171.4	SURCHARGED	4

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
7.000	70	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.009	9	15 Winter	30	+0%	1/15 Summer			
1.010	10	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
8.000	80	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
9.000	90	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
10.000	24	15 Winter	30	+0%	100/30 Winter			
10.001	25	30 Winter	30	+0%	100/15 Summer			
11.000	26	30 Winter	30	+0%	30/15 Summer	100/15 Summer		
10.002	27	30 Winter	30	+0%	30/15 Summer	100/15 Summer		
8.001	81	15 Summer	30	+0%	1/15 Summer	100/15 Summer		
12.000	29	15 Winter	30	+0%	100/15 Winter			
12.001	30	30 Winter	30	+0%	100/15 Summer			
12.002	31	30 Winter	30	+0%	30/15 Summer			
12.003	32	30 Winter	30	+0%	30/15 Summer			
8.002	82	15 Summer	30	+0%	1/15 Summer			
13.000	100	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
8.003	83	15 Summer	30	+0%	1/15 Summer			
8.004	84	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
8.005	85	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
1.011	11	15 Winter	30	+0%	1/15 Summer			
14.000	110	15 Winter	30	+0%	100/15 Summer			
14.001	111	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
14.002	112	15 Summer	30	+0%	1/15 Summer			
1.012	12	15 Winter	30	+0%	1/15 Summer			

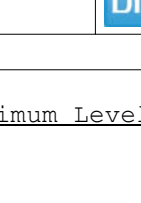
PN	US/MH Name	Water			Flooded		Pipe		Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	
6.001	61	7.033	0.553	0.000	2.12		256.5	SURCHARGED	
7.000	70	7.139	0.439	0.000	1.04		145.1	SURCHARGED	4
1.009	9	6.608	1.722	0.000	1.13		308.2	SURCHARGED	
1.010	10	6.576	1.646	0.000	0.58		315.0	SURCHARGED	4
8.000	80	6.826	0.826	0.000	0.86		59.7	SURCHARGED	4
9.000	90	6.812	0.930	0.000	1.23		140.3	SURCHARGED	6
10.000	24	6.433	-0.167	0.000	0.39		29.5	OK	
10.001	25	6.200	-0.070	0.000	0.63		47.6	OK	
11.000	26	6.481	0.181	0.000	0.23		19.9	SURCHARGED	3
10.002	27	6.466	0.376	0.000	0.31		125.1	SURCHARGED	1
8.001	81	6.792	1.267	0.000	0.53		149.8	SURCHARGED	6
12.000	29	6.473	-0.127	0.000	0.61		46.0	OK	
12.001	30	6.184	-0.106	0.000	0.49		36.8	OK	
12.002	31	6.313	0.333	0.000	0.57		41.8	SURCHARGED	
12.003	32	6.349	0.569	0.000	0.47		81.2	SURCHARGED	
8.002	82	6.969	1.669	0.000	0.97		235.2	SURCHARGED	
13.000	100	8.769	0.394	0.000	0.78		235.7	SURCHARGED	4

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		Exceeded
8.003	83	7.026	1.781	0.000	0.91		236.5	SURCHARGED	
8.004	84	6.907	1.772	0.000	1.52		365.6	SURCHARGED	2
8.005	85	6.816	1.766	0.000	2.98		622.0	SURCHARGED	1
1.011	11	6.470	1.840	0.000	1.67		792.3	SURCHARGED	
14.000	110	8.374	-0.226	0.000	0.69		509.7	OK	
14.001	111	7.077	-0.078	0.000	0.76		780.8	OK	2
14.002	112	6.031	1.131	0.000	1.47		879.0	SURCHARGED	
1.012	12	5.503	1.203	0.000	0.82		1605.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.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 Storage Structures	8
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	60 Winter	100	+30%	30/15 Summer	100/15 Winter		
1.001	2	60 Winter	100	+30%	100/15 Summer			
2.000	20	15 Winter	100	+30%				
2.001	21	15 Winter	100	+30%				
1.002	3	60 Winter	100	+30%	30/120 Winter			
1.003	4	60 Winter	100	+30%	30/30 Summer			
1.004	5	60 Winter	100	+30%	30/15 Summer			
3.000	30	15 Winter	100	+30%	30/15 Summer			
4.000	11	15 Winter	100	+30%	100/15 Summer			
4.001	12	120 Winter	100	+30%	100/30 Summer			
4.002	40	120 Winter	100	+30%	100/15 Summer			
1.005	6	15 Winter	100	+30%	1/15 Summer			
5.000	50	15 Winter	100	+30%	30/15 Summer			
1.006	7	15 Winter	100	+30%	1/15 Summer			
1.007	13	15 Winter	100	+30%	1/15 Summer			
1.008	8	15 Winter	100	+30%	1/15 Summer	100/15 Summer		
6.000	60	15 Winter	100	+30%	30/15 Summer	100/15 Summer		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS


PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)		Flow (l/s)		
1.000	1	6.772	0.572	2.465	1.09	62.8	FLOOD	2
1.001	2	6.772	0.772	0.000	0.38	69.6	SURCHARGED	
2.000	20	8.931	-0.094	0.000	0.63	55.8	OK	
2.001	21	7.182	-0.043	0.000	0.97	64.3	OK	
1.002	3	6.699	0.884	0.000	0.89	175.5	SURCHARGED	
1.003	4	6.663	1.058	0.000	0.56	104.4	SURCHARGED	
1.004	5	6.639	1.194	0.000	0.61	115.3	SURCHARGED	
3.000	30	7.763	1.873	0.000	1.45	131.5	FLOOD RISK	
4.000	11	6.388	0.188	0.000	1.35	87.4	SURCHARGED	
4.001	12	6.228	0.238	0.000	0.34	26.8	SURCHARGED	
4.002	40	6.222	0.332	0.000	0.81	71.2	SURCHARGED	
1.005	6	6.824	1.504	0.000	0.63	105.0	SURCHARGED	
5.000	50	7.358	1.498	0.000	0.73	75.5	SURCHARGED	
1.006	7	7.089	1.799	0.000	0.30	105.8	SURCHARGED	
1.007	13	7.097	2.007	0.000	0.45	105.8	SURCHARGED	
1.008	8	7.124	2.084	24.289	0.36	105.6	FLOOD	4
6.000	60	7.938	1.238	37.982	1.05	177.3	FLOOD	4

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.001	61 15	Winter	100	+30%	30/15 Summer	100/15 Summer		
7.000	70 15	Winter	100	+30%	30/15 Summer	100/15 Summer		
1.009	9 15	Winter	100	+30%	1/15 Summer			
1.010	10 15	Winter	100	+30%	1/15 Summer	100/15 Summer		
8.000	80 15	Winter	100	+30%	30/15 Summer	100/15 Summer		
9.000	90 30	Winter	100	+30%	1/15 Summer	100/15 Summer		
10.000	24 60	Winter	100	+30%	100/30 Winter			
10.001	25 60	Winter	100	+30%	100/15 Summer			
11.000	26 30	Winter	100	+30%	30/15 Summer	100/15 Summer		
10.002	27 30	Winter	100	+30%	30/15 Summer	100/15 Summer		
8.001	81 30	Winter	100	+30%	1/15 Summer	100/15 Summer		
12.000	29 15	Winter	100	+30%	100/15 Winter			
12.001	30 60	Winter	100	+30%	100/15 Summer			
12.002	31 30	Winter	100	+30%	30/15 Summer			
12.003	32 30	Winter	100	+30%	30/15 Summer			
8.002	82 30	Winter	100	+30%	1/15 Summer			
13.000	100 15	Winter	100	+30%	30/15 Summer	100/15 Summer		
8.003	83 15	Summer	100	+30%	1/15 Summer			
8.004	84 15	Winter	100	+30%	1/15 Summer	100/15 Summer		
8.005	85 15	Summer	100	+30%	1/15 Summer	100/15 Summer		
1.011	11 15	Summer	100	+30%	1/15 Summer			
14.000	110 15	Winter	100	+30%	100/15 Summer			
14.001	111 15	Winter	100	+30%	100/15 Summer	100/15 Summer		
14.002	112 15	Winter	100	+30%	1/15 Summer			
1.012	12 15	Winter	100	+30%	1/15 Summer			


PN	US/MH Name	Water			Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)			
6.001	61	7.881	1.401	0.070	2.41		291.0		FLOOD	
7.000	70	7.924	1.224	24.107	1.31		183.4		FLOOD	4
1.009	9	7.314	2.428	0.000	1.05		284.9		SURCHARGED	
1.010	10	7.291	2.361	31.070	0.68		370.4		FLOOD	4
8.000	80	7.477	1.477	7.314	0.97		67.7		FLOOD	4
9.000	90	7.347	1.465	37.098	1.20		136.9		FLOOD	6
10.000	24	6.696	0.096	0.000	0.35		26.7		SURCHARGED	
10.001	25	6.688	0.418	0.000	1.12		84.2		SURCHARGED	
11.000	26	7.301	1.001	0.723	0.30		26.5		FLOOD	3
10.002	27	7.300	1.210	0.377	0.27		108.2		FLOOD	1
8.001	81	7.328	1.803	128.659	0.83		233.3		FLOOD	6
12.000	29	6.613	0.013	0.000	1.01		76.2		SURCHARGED	
12.001	30	6.570	0.280	0.000	0.88		66.1		SURCHARGED	
12.002	31	7.250	1.270	0.000	0.87		63.9		SURCHARGED	
12.003	32	7.483	1.703	0.000	0.55		95.9		SURCHARGED	
8.002	82	7.577	2.277	0.000	1.26		303.8		FLOOD RISK	
13.000	100	10.030	1.655	29.661	0.94		284.5		FLOOD	4

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 1200.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		
8.003	83	7.833	2.588	0.000	1.15		299.1	FLOOD RISK	
8.004	84	7.974	2.839	14.455	1.73		416.5	FLOOD	2
8.005	85	7.960	2.910	0.092	3.75		783.0	FLOOD	1
1.011	11	7.316	2.686	0.000	2.06		975.7	FLOOD RISK	
14.000	110	9.945	1.345	0.000	0.97		723.1	FLOOD RISK	
14.001	111	8.517	1.362	17.149	1.00		1032.8	FLOOD	2
14.002	112	6.377	1.477	0.000	2.00		1193.2	SURCHARGED	
1.012	12	5.750	1.450	0.000	1.11		2172.4	SURCHARGED	

Appendix 7g – Drainage Model Files – Stage 2 ‘Half Tide Wharf’ Area

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Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...	Monarchs Quay Proposed Halftide Wharf SW Stage 2	
Date 20/11/2017 File OUTFALL 900 - Phase 2.mdx	Designed by S.McLean Checked by	
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Existing Network Details for OUTFALL 900.SWS

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.000	57.667	0.235	245.4	0.115	5.00	0.0	0.013	o	300	Pipe/Conduit
1.001	49.237	0.200	246.2	0.109	0.00	0.0	0.013	o	300	Pipe/Conduit
1.002	14.797	0.060	246.6	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.003	34.432	0.138	250.0	0.100	5.00	0.0	0.013	o	300	Pipe/Conduit
2.000	38.985	0.310	125.8	0.200	5.00	0.0	0.013	o	300	Pipe/Conduit
2.001	45.364	0.340	133.4	0.035	0.00	0.0	0.013	o	300	Pipe/Conduit
2.002	31.067	0.230	135.1	0.025	0.00	0.0	0.013	o	300	Pipe/Conduit
2.003	11.855	0.175	67.7	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
3.000	22.765	0.152	149.8	0.148	5.00	0.0	0.013	o	150	Pipe/Conduit
4.000	57.667	0.235	245.4	0.132	5.00	0.0	0.013	o	300	Pipe/Conduit
4.001	44.273	0.180	246.0	0.144	0.00	0.0	0.013	o	300	Pipe/Conduit
4.002	23.769	0.095	250.0	0.000	0.00	0.0	0.013	o	300	Pipe/Conduit
1.004	20.000#	0.045	444.4	0.024	0.00	0.0	0.013	o	375	Pipe/Conduit
5.000	20.000#	0.170	117.6	0.364	5.00	0.0	0.013	o	375	Pipe/Conduit
5.001	11.845#	0.125	94.8	0.000	0.00	0.0	0.013	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	6.150	0.115	0.0	0.87	61.7
1.001	5.915	0.224	0.0	0.87	61.6
1.002	5.715	0.224	0.0	0.87	61.6
1.003	5.655	0.324	0.0	0.87	61.2
2.000	6.580	0.200	0.0	1.22	86.2
2.001	6.270	0.235	0.0	1.18	83.7
2.002	5.930	0.260	0.0	1.18	83.2
2.003	5.700	0.260	0.0	1.66	117.5
3.000	5.600	0.148	0.0	0.70	12.4
4.000	6.000	0.132	0.0	0.87	61.7
4.001	5.765	0.276	0.0	0.87	61.7
4.002	5.585	0.276	0.0	0.87	61.2
1.004	5.450	1.032	0.0	0.75	83.2
5.000	5.700	0.364	0.0	1.46	161.6
5.001	5.530	0.364	0.0	0.89	15.6

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Existing Network Details for OUTFALL 900.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	n	HYD SECT	DIA (mm)	Section Type
1.005	37.632#	0.105	358.4	0.081	0.00	0.0	0.013	o	375	Pipe/Conduit
1.006	46.501	0.100	465.0	0.174	0.00	0.0	0.013	o	450	Pipe/Conduit
1.007	33.647	0.075	448.6	0.035	0.00	0.0	0.013	o	450	Pipe/Conduit
1.008	29.891	0.335	89.2	0.039	0.00	0.0	0.013	o	450	Pipe/Conduit
6.000	4.672	0.025	186.9	0.345	5.00	0.0	0.013	o	600	Pipe/Conduit
7.000	89.092	0.750	118.8	0.131	2.00	0.0	0.013	o	225	Pipe/Conduit
6.001	21.172	0.085	249.1	0.059	0.00	0.0	0.013	o	600	Pipe/Conduit
1.009	40.384	0.290	139.3	1.044	0.00	0.0	0.013	o	600	Pipe/Conduit
8.000	95.909	0.300	319.7	1.366	5.00	0.0	0.013	o	600	Pipe/Conduit
1.010	12.545	0.100	125.5	0.000	0.00	0.0	0.013	o	900	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.005	5.405	1.477	0.0	0.84	92.6
1.006	5.250	1.651	0.0	0.83	132.2
1.007	5.150	1.686	0.0	0.85	134.6
1.008	5.075	1.725	0.0	1.90	301.8
6.000	4.700	0.345	0.0	1.59	449.2
7.000	5.800	0.131	0.0	1.04	41.2
6.001	4.675	0.535	0.0	1.38	389.0
1.009	4.590	3.304	0.0	1.84	520.3
8.000	4.600	1.366	0.0	1.21	343.4
1.010	4.300	4.670	0.0	2.54	1616.3

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XP Solutions				Network 2017.1.2							
<u>Manhole Schedules for OUTFALL 900.SWS</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	
1	7.200	1.050	Open Manhole	1200	1.000	6.150	300				
2	7.200	1.285	Open Manhole	1200	1.001	5.915	300	1.000	5.915	300	
3	7.200	1.485	Open Manhole	1200	1.002	5.715	300	1.001	5.715	300	
1	6.750	1.095	Open Manhole	1200	1.003	5.655	300	1.002	5.655	300	
10	7.980	1.400	Open Manhole	1200	2.000	6.580	300				
11	7.300	1.030	Open Manhole	1200	2.001	6.270	300	2.000	6.270	300	
12	6.930	1.000	Open Manhole	1200	2.002	5.930	300	2.001	5.930	300	
13	6.760	1.060	Open Manhole	1200	2.003	5.700	300	2.002	5.700	300	
6	7.300	1.700	Open Manhole	1200	3.000	5.600	150				
7	7.200	1.200	Open Manhole	1200	4.000	6.000	300				
8	7.200	1.435	Open Manhole	1200	4.001	5.765	300	4.000	5.765	300	
9	7.200	1.615	Open Manhole	1200	4.002	5.585	300	4.001	5.585	300	
7	6.670	1.222	Open Manhole	1350	1.004	5.450	375	1.003	5.517	300	
								2.003	5.525	300	
								3.000	5.448	150	
								4.002	5.490	300	
14	7.000	1.300	Open Manhole	1200	5.000	5.700	375				
15	6.825	1.295	Open Manhole	1200	5.001	5.530	150	5.000	5.530	375	
14	6.600	1.195	Open Manhole	1200	1.005	5.405	375	1.004	5.405	375	
								5.001	5.405	150	
8	6.680	1.430	Open Manhole	1350	1.006	5.250	450	1.005	5.300	375	
9	6.800	1.650	Open Manhole	1350	1.007	5.150	450	1.006	5.150	450	
10	7.100	2.025	Open Manhole	1350	1.008	5.075	450	1.007	5.075	450	
11	7.300	2.600	Open Manhole	1500	6.000	4.700	600				
12	7.300	1.500	Open Manhole	1200	7.000	5.800	225				
13	7.300	2.625	Open Manhole	1500	6.001	4.675	600	6.000	4.675	600	
								7.000	5.050	225	
14	7.370	2.780	Open Manhole	1500	1.009	4.590	600	1.008	4.740	450	
								6.001	4.590	600	
15	7.400	2.800	Open Manhole	1500	8.000	4.600	600				
16	7.350	3.050	Open Manhole	2100	1.010	4.300	900	1.009	4.300	600	
								8.000	4.300	600	
8	7.300	3.100	Open Manhole	0		OUTFALL		1.010	4.200	900	
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PIPELINE SCHEDULES for OUTFALL 900.SWS


Upstream Manhole

- Indicates pipe length does not match coordinates

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	7.200	6.150	0.750	Open Manhole	1200
1.001	o	300	2	7.200	5.915	0.985	Open Manhole	1200
1.002	o	300	3	7.200	5.715	1.185	Open Manhole	1200
1.003	o	300	1	6.750	5.655	0.795	Open Manhole	1200
2.000	o	300	10	7.980	6.580	1.100	Open Manhole	1200
2.001	o	300	11	7.300	6.270	0.730	Open Manhole	1200
2.002	o	300	12	6.930	5.930	0.700	Open Manhole	1200
2.003	o	300	13	6.760	5.700	0.760	Open Manhole	1200
3.000	o	150	6	7.300	5.600	1.550	Open Manhole	1200
4.000	o	300	7	7.200	6.000	0.900	Open Manhole	1200
4.001	o	300	8	7.200	5.765	1.135	Open Manhole	1200
4.002	o	300	9	7.200	5.585	1.315	Open Manhole	1200
1.004	o	375	7	6.670	5.450	0.845	Open Manhole	1350
5.000	o	375	14	7.000	5.700	0.925	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)
1.000	57.667	245.4	2	7.200	5.915	0.985	Open Manhole	1200
1.001	49.237	246.2	3	7.200	5.715	1.185	Open Manhole	1200
1.002	14.797	246.6	1	6.750	5.655	0.795	Open Manhole	1200
1.003	34.432	250.0	7	6.670	5.517	0.853	Open Manhole	1350
2.000	38.985	125.8	11	7.300	6.270	0.730	Open Manhole	1200
2.001	45.364	133.4	12	6.930	5.930	0.700	Open Manhole	1200
2.002	31.067	135.1	13	6.760	5.700	0.760	Open Manhole	1200
2.003	11.855	67.7	7	6.670	5.525	0.845	Open Manhole	1350
3.000	22.765	149.8	7	6.670	5.448	1.072	Open Manhole	1350
4.000	57.667	245.4	8	7.200	5.765	1.135	Open Manhole	1200
4.001	44.273	246.0	9	7.200	5.585	1.315	Open Manhole	1200
4.002	23.769	250.0	7	6.670	5.490	0.880	Open Manhole	1350
1.004	20.000#	444.4	14	6.600	5.405	0.820	Open Manhole	1200
5.000	20.000#	117.6	15	6.825	5.530	0.920	Open Manhole	1200

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PIPELINE SCHEDULES for OUTFALL 900.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)
5.001	o	150	15	6.825	5.530	1.145	Open Manhole	1200
1.005	o	375	14	6.600	5.405	0.820	Open Manhole	1200
1.006	o	450	8	6.680	5.250	0.980	Open Manhole	1350
1.007	o	450	9	6.800	5.150	1.200	Open Manhole	1350
1.008	o	450	10	7.100	5.075	1.575	Open Manhole	1350
6.000	o	600	11	7.300	4.700	2.000	Open Manhole	1500
7.000	o	225	12	7.300	5.800	1.275	Open Manhole	1200
6.001	o	600	13	7.300	4.675	2.025	Open Manhole	1500
1.009	o	600	14	7.370	4.590	2.180	Open Manhole	1500
8.000	o	600	15	7.400	4.600	2.200	Open Manhole	1500
1.010	o	900	16	7.350	4.300	2.150	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)
5.001	11.845#	94.8	14	6.600	5.405	1.045	Open Manhole	1200
1.005	37.632#	358.4	8	6.680	5.300	1.005	Open Manhole	1350
1.006	46.501	465.0	9	6.800	5.150	1.200	Open Manhole	1350
1.007	33.647	448.6	10	7.100	5.075	1.575	Open Manhole	1350
1.008	29.891	89.2	14	7.370	4.740	2.180	Open Manhole	1500
6.000	4.672	186.9	13	7.300	4.675	2.025	Open Manhole	1500
7.000	89.092	118.8	13	7.300	5.050	2.025	Open Manhole	1500
6.001	21.172	249.1	14	7.370	4.590	2.180	Open Manhole	1500
1.009	40.384	139.3	16	7.350	4.300	2.450	Open Manhole	2100
8.000	95.909	319.7	16	7.350	4.300	2.450	Open Manhole	2100
1.010	12.545	125.5	8	7.300	4.200	2.200	Open Manhole	0

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Surcharged Outfall Details for OUTFALL 900.SWS

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
------------------------	------------------------------	-----------------	------------------------	-------------	-----------

1.010	8	7.300	4.200	4.200	0 0
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Datum (m) 4.200 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.250	41	1.250	81	1.250	121	1.250	161	1.250	201	1.250
2	1.250	42	1.250	82	1.250	122	1.250	162	1.250	202	1.250
3	1.250	43	1.250	83	1.250	123	1.250	163	1.250	203	1.250
4	1.250	44	1.250	84	1.250	124	1.250	164	1.250	204	1.250
5	1.250	45	1.250	85	1.250	125	1.250	165	1.250	205	1.250
6	1.250	46	1.250	86	1.250	126	1.250	166	1.250	206	1.250
7	1.250	47	1.250	87	1.250	127	1.250	167	1.250	207	1.250
8	1.250	48	1.250	88	1.250	128	1.250	168	1.250	208	1.250
9	1.250	49	1.250	89	1.250	129	1.250	169	1.250	209	1.250
10	1.250	50	1.250	90	1.250	130	1.250	170	1.250	210	1.250
11	1.250	51	1.250	91	1.250	131	1.250	171	1.250	211	1.250
12	1.250	52	1.250	92	1.250	132	1.250	172	1.250	212	1.250
13	1.250	53	1.250	93	1.250	133	1.250	173	1.250	213	1.250
14	1.250	54	1.250	94	1.250	134	1.250	174	1.250	214	1.250
15	1.250	55	1.250	95	1.250	135	1.250	175	1.250	215	1.250
16	1.250	56	1.250	96	1.250	136	1.250	176	1.250	216	1.250
17	1.250	57	1.250	97	1.250	137	1.250	177	1.250	217	1.250
18	1.250	58	1.250	98	1.250	138	1.250	178	1.250	218	1.250
19	1.250	59	1.250	99	1.250	139	1.250	179	1.250	219	1.250
20	1.250	60	1.250	100	1.250	140	1.250	180	1.250	220	1.250
21	1.250	61	1.250	101	1.250	141	1.250	181	1.250	221	1.250
22	1.250	62	1.250	102	1.250	142	1.250	182	1.250	222	1.250
23	1.250	63	1.250	103	1.250	143	1.250	183	1.250	223	1.250
24	1.250	64	1.250	104	1.250	144	1.250	184	1.250	224	1.250
25	1.250	65	1.250	105	1.250	145	1.250	185	1.250	225	1.250
26	1.250	66	1.250	106	1.250	146	1.250	186	1.250	226	1.250
27	1.250	67	1.250	107	1.250	147	1.250	187	1.250	227	1.250
28	1.250	68	1.250	108	1.250	148	1.250	188	1.250	228	1.250
29	1.250	69	1.250	109	1.250	149	1.250	189	1.250	229	1.250
30	1.250	70	1.250	110	1.250	150	1.250	190	1.250	230	1.250
31	1.250	71	1.250	111	1.250	151	1.250	191	1.250	231	1.250
32	1.250	72	1.250	112	1.250	152	1.250	192	1.250	232	1.250
33	1.250	73	1.250	113	1.250	153	1.250	193	1.250	233	1.250
34	1.250	74	1.250	114	1.250	154	1.250	194	1.250	234	1.250
35	1.250	75	1.250	115	1.250	155	1.250	195	1.250	235	1.250
36	1.250	76	1.250	116	1.250	156	1.250	196	1.250	236	1.250
37	1.250	77	1.250	117	1.250	157	1.250	197	1.250	237	1.250
38	1.250	78	1.250	118	1.250	158	1.250	198	1.250	238	1.250
39	1.250	79	1.250	119	1.250	159	1.250	199	1.250	239	1.250
40	1.250	80	1.250	120	1.250	160	1.250	200	1.250	240	1.250

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Storage Structures for OUTFALL 900.SWS

Cellular Storage Manhole: 2, DS/PN: 1.001

Invert Level (m) 5.915 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	178.0	178.0	1.300	0.0	207.4
0.100	178.0	183.3	1.400	0.0	207.4
0.200	178.0	188.7	1.500	0.0	207.4
0.300	178.0	194.0	1.600	0.0	207.4
0.400	178.0	199.3	1.700	0.0	207.4
0.500	178.0	204.7	1.800	0.0	207.4
0.600	0.0	207.4	1.900	0.0	207.4
0.700	0.0	207.4	2.000	0.0	207.4
0.800	0.0	207.4	2.100	0.0	207.4
0.900	0.0	207.4	2.200	0.0	207.4
1.000	0.0	207.4	2.300	0.0	207.4
1.100	0.0	207.4	2.400	0.0	207.4
1.200	0.0	207.4	2.500	0.0	207.4


Cellular Storage Manhole: 1, DS/PN: 1.003


Invert Level (m) 5.560 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.97
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)
0.000	160.0	160.0	1.300	0.0	187.8
0.100	160.0	165.1	1.400	0.0	187.8
0.200	160.0	170.1	1.500	0.0	187.8
0.300	160.0	175.2	1.600	0.0	187.8
0.400	160.0	180.2	1.700	0.0	187.8
0.500	160.0	185.3	1.800	0.0	187.8
0.600	0.0	187.8	1.900	0.0	187.8
0.700	0.0	187.8	2.000	0.0	187.8
0.800	0.0	187.8	2.100	0.0	187.8
0.900	0.0	187.8	2.200	0.0	187.8
1.000	0.0	187.8	2.300	0.0	187.8
1.100	0.0	187.8	2.400	0.0	187.8
1.200	0.0	187.8	2.500	0.0	187.8

Cellular Storage Manhole: 6, DS/PN: 3.000

Invert Level (m) 5.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

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Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...		Monarchs Quay Proposed Halftide Wharf SW Stage 2																																																																																																																																																																																																																																																									
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Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>465.0</td><td>465.0</td><td>0.600</td><td>0.0</td><td>503.8</td></tr><tr><td>0.100</td><td>465.0</td><td>473.6</td><td>0.700</td><td>0.0</td><td>503.8</td></tr><tr><td>0.200</td><td>465.0</td><td>482.3</td><td>0.800</td><td>0.0</td><td>503.8</td></tr><tr><td>0.300</td><td>465.0</td><td>490.9</td><td>0.900</td><td>0.0</td><td>503.8</td></tr><tr><td>0.400</td><td>465.0</td><td>499.5</td><td>1.000</td><td>0.0</td><td>503.8</td></tr><tr><td>0.500</td><td>0.0</td><td>503.8</td><td>1.100</td><td>0.0</td><td>503.8</td></tr></table>						Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	200.0	200.0	1.300	0.0	231.1	0.100	200.0	205.7	1.400	0.0	231.1	0.200	200.0	211.3	1.500	0.0	231.1	0.300	200.0	217.0	1.600	0.0	231.1	0.400	200.0	222.6	1.700	0.0	231.1	0.500	200.0	228.3	1.800	0.0	231.1	0.600	0.0	231.1	1.900	0.0	231.1	0.700	0.0	231.1	2.000	0.0	231.1	0.800	0.0	231.1	2.100	0.0	231.1	0.900	0.0	231.1	2.200	0.0	231.1	1.000	0.0	231.1	2.300	0.0	231.1	1.100	0.0	231.1	2.400	0.0	231.1	1.200	0.0	231.1	2.500	0.0	231.1	Invert Level (m)		5.765	Safety Factor		2.0	Infiltration Coefficient Base (m/hr)		0.00000	Porosity		0.97	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)	0.000	150.0	150.0	1.300	0.0	176.9	0.100	150.0	154.9	1.400	0.0	176.9	0.200	150.0	159.8	1.500	0.0	176.9	0.300	150.0	164.7	1.600	0.0	176.9	0.400	150.0	169.6	1.700	0.0	176.9	0.500	150.0	174.5	1.800	0.0	176.9	0.600	0.0	176.9	1.900	0.0	176.9	0.700	0.0	176.9	2.000	0.0	176.9	0.800	0.0	176.9	2.100	0.0	176.9	0.900	0.0	176.9	2.200	0.0	176.9	1.000	0.0	176.9	2.300	0.0	176.9	1.100	0.0	176.9	2.400	0.0	176.9	1.200	0.0	176.9	2.500	0.0	176.9	Invert Level (m)		5.700	Safety Factor		2.0	Infiltration Coefficient Base (m/hr)		0.00000	Porosity		0.97	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)	0.000	465.0	465.0	0.600	0.0	503.8	0.100	465.0	473.6	0.700	0.0	503.8	0.200	465.0	482.3	0.800	0.0	503.8	0.300	465.0	490.9	0.900	0.0	503.8	0.400	465.0	499.5	1.000	0.0	503.8	0.500	0.0	503.8	1.100	0.0	503.8
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Cellular Storage Manhole: 14, DS/PN: 5.000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
1.200	0.0	503.8	1.900	0.0	503.8
1.300	0.0	503.8	2.000	0.0	503.8
1.400	0.0	503.8	2.100	0.0	503.8
1.500	0.0	503.8	2.200	0.0	503.8
1.600	0.0	503.8	2.300	0.0	503.8
1.700	0.0	503.8	2.400	0.0	503.8
1.800	0.0	503.8	2.500	0.0	503.8

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)			0.750
M5-60 (mm)	20.000 Cv (Winter)		0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1	15 Winter	1	+0%	100/15 Summer			
1.001	2	60 Winter	1	+0%	100/30 Winter			
1.002	3	60 Winter	1	+0%	100/15 Summer			
1.003	1	240 Winter	1	+0%	100/15 Summer			
2.000	10	15 Winter	1	+0%	100/15 Summer			
2.001	11	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
2.002	12	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
2.003	13	15 Winter	1	+0%	30/15 Summer			
3.000	6	60 Winter	1	+0%	30/15 Winter			
4.000	7	15 Winter	1	+0%	100/15 Summer			
4.001	8	30 Winter	1	+0%	100/15 Summer			
4.002	9	30 Winter	1	+0%	30/15 Summer			
1.004	7	30 Winter	1	+0%	30/15 Summer			
5.000	14	120 Winter	1	+0%				
5.001	15	30 Winter	1	+0%	30/15 Summer			
1.005	14	30 Winter	1	+0%	30/15 Summer			
1.006	8	30 Winter	1	+0%	30/15 Summer	100/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.SWS

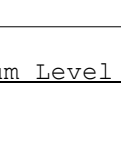
PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		Exceeded
1.000	1	6.256	-0.194	0.000	0.26		15.7	OK	
1.001	2	5.990	-0.225	0.000	0.14		8.4	OK	
1.002	3	5.794	-0.221	0.000	0.16		8.4	OK	
1.003	1	5.719	-0.236	0.000	0.10		5.8	OK	
2.000	10	6.702	-0.178	0.000	0.34		27.3	OK	
2.001	11	6.400	-0.170	0.000	0.38		30.6	OK	3
2.002	12	6.068	-0.162	0.000	0.43		33.2	OK	2
2.003	13	5.820	-0.180	0.000	0.33		32.9	OK	
3.000	6	5.666	-0.084	0.000	0.38		4.5	OK	
4.000	7	6.115	-0.185	0.000	0.30		17.6	OK	
4.001	8	5.860	-0.205	0.000	0.22		12.9	OK	
4.002	9	5.703	-0.182	0.000	0.24		13.3	OK	
1.004	7	5.678	-0.147	0.000	0.49		33.8	OK	
5.000	14	5.759	-0.316	0.000	0.06		8.5	OK	
5.001	15	5.671	-0.009	0.000	0.55		7.9	OK	
1.005	14	5.644	-0.136	0.000	0.52		44.9	OK	
1.006	8	5.602	-0.098	0.000	0.45		55.3	OK	3

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Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36...	Monarchs Quay Proposed Halftide Wharf SW Stage 2	
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

									Water
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period		Change	Surcharge	Flood	Overflow	Act.
1.007	9	30 Winter		1	+0%	30/15 Summer	100/15 Winter		5.570
1.008	10	30 Winter		1	+0%	1/15 Summer			5.543
6.000	11	30 Winter		1	+0%	1/15 Summer			5.534
7.000	12	15 Summer		1	+0%	30/15 Summer	100/15 Summer		5.927
6.001	13	30 Winter		1	+0%	1/15 Summer			5.531
1.009	14	30 Winter		1	+0%	1/15 Summer			5.521
8.000	15	15 Winter		1	+0%	1/15 Summer	100/15 Winter		5.563
1.010	16	15 Winter		1	+0%	1/15 Summer			5.471

		Surcharged		Flooded		Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded	
1.007	9	-0.030	0.000	0.48		58.2	OK	1	
1.008	10	0.018	0.000	0.23		60.7	SURCHARGED		
6.000	11	0.234	0.000	0.15		36.6	SURCHARGED		
7.000	12	-0.098	0.000	0.56		22.7	OK	4	
6.001	13	0.256	0.000	0.18		55.7	SURCHARGED		
1.009	14	0.331	0.000	0.41		186.7	SURCHARGED		
8.000	15	0.363	0.000	0.47		153.3	SURCHARGED	1	
1.010	16	0.271	0.000	0.34		321.7	SURCHARGED		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1 15	Winter	30	+0%	100/15	Summer		
1.001	2 30	Winter	30	+0%	100/30	Winter		
1.002	3 60	Winter	30	+0%	100/15	Summer		
1.003	1 60	Winter	30	+0%	100/15	Summer		
2.000	10 15	Winter	30	+0%	100/15	Summer		
2.001	11 15	Winter	30	+0%	100/15	Summer	100/15	Summer
2.002	12 15	Winter	30	+0%	30/15	Summer	100/15	Summer
2.003	13 15	Winter	30	+0%	30/15	Summer		
3.000	6 60	Winter	30	+0%	30/15	Winter		
4.000	7 15	Winter	30	+0%	100/15	Summer		
4.001	8 30	Winter	30	+0%	100/15	Summer		
4.002	9 15	Winter	30	+0%	30/15	Summer		
1.004	7 15	Winter	30	+0%	30/15	Summer		
5.000	14 60	Winter	30	+0%				
5.001	15 15	Winter	30	+0%	30/15	Summer		
1.005	14 15	Winter	30	+0%	30/15	Summer		
1.006	8 15	Winter	30	+0%	30/15	Summer	100/15	Summer

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for UTFALL 900.SWS

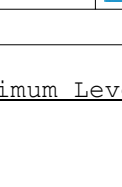
PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
1.000	1	6.330	-0.120	0.000	0.63		37.2		OK		
1.001	2	6.064	-0.151	0.000	0.49		28.8		OK		
1.002	3	5.901	-0.114	0.000	0.48		25.6		OK		
1.003	1	5.878	-0.077	0.000	0.55		31.5		OK		
2.000	10	6.793	-0.087	0.000	0.82		67.0		OK		
2.001	11	6.563	-0.007	0.000	0.91		72.7		OK		3
2.002	12	6.321	0.091	0.000	0.98		76.2	SURCHARGED			2
2.003	13	6.131	0.131	0.000	0.82		81.2	SURCHARGED			
3.000	6	5.829	0.079	0.000	0.90		10.8	SURCHARGED			
4.000	7	6.198	-0.102	0.000	0.72		42.6		OK		
4.001	8	6.016	-0.049	0.000	0.74		43.5		OK		
4.002	9	6.044	0.159	0.000	0.85		47.3	SURCHARGED			
1.004	7	6.058	0.233	0.000	1.13		77.4	SURCHARGED			
5.000	14	5.868	-0.207	0.000	0.13		17.7		OK		
5.001	15	5.907	0.227	0.000	1.06		15.4	SURCHARGED			
1.005	14	6.054	0.274	0.000	0.97		82.8	SURCHARGED			
1.006	8	6.043	0.343	0.000	0.74		90.1	SURCHARGED			3

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for OUTFALL 900.SWS

US/MH		Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
PN	Name								
1.007	9	15 Winter	30	+0%	30/15 Summer	100/15 Winter			6.007
1.008	10	15 Winter	30	+0%	1/15 Summer				5.971
6.000	11	15 Winter	30	+0%	1/15 Summer				5.976
7.000	12	15 Summer	30	+0%	30/15 Summer	100/15 Summer			6.666
6.001	13	15 Winter	30	+0%	1/15 Summer				5.967
1.009	14	15 Winter	30	+0%	1/15 Summer				5.933
8.000	15	15 Winter	30	+0%	1/15 Summer	100/15 Winter			6.133
1.010	16	15 Winter	30	+0%	1/15 Summer				5.541

		Surcharged		Flooded		Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded	
1.007	9	0.407	0.000	0.78		93.8	SURCHARGED	1	
1.008	10	0.446	0.000	0.36		96.5	SURCHARGED		
6.000	11	0.676	0.000	0.46		109.0	SURCHARGED		
7.000	12	0.641	0.000	0.97		39.4	SURCHARGED	4	
6.001	13	0.692	0.000	0.52		162.8	SURCHARGED		
1.009	14	0.743	0.000	1.14		518.7	SURCHARGED		
8.000	15	0.933	0.000	1.29		418.8	SURCHARGED	1	
1.010	16	0.341	0.000	0.98		939.4	SURCHARGED		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for UTFALL 900.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 Storage Structures	5
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details


Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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.
1.000	1 15	Winter	100	+30%	100/15	Summer		
1.001	2 30	Winter	100	+30%	100/30	Winter		
1.002	3 30	Winter	100	+30%	100/15	Summer		
1.003	1 30	Winter	100	+30%	100/15	Summer		
2.000	10 15	Winter	100	+30%	100/15	Summer		
2.001	11 15	Winter	100	+30%	100/15	Summer	100/15	Summer
2.002	12 15	Winter	100	+30%	30/15	Summer	100/15	Summer
2.003	13 15	Winter	100	+30%	30/15	Summer		
3.000	6 60	Winter	100	+30%	30/15	Winter		
4.000	7 30	Winter	100	+30%	100/15	Summer		
4.001	8 30	Winter	100	+30%	100/15	Summer		
4.002	9 15	Summer	100	+30%	30/15	Summer		
1.004	7 15	Summer	100	+30%	30/15	Summer		
5.000	14 60	Winter	100	+30%				
5.001	15 15	Summer	100	+30%	30/15	Summer		
1.005	14 15	Summer	100	+30%	30/15	Summer		
1.006	8 15	Winter	100	+30%	30/15	Summer	100/15	Summer

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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for OUTFALL 900.SWS

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)			Flow (l/s)		
1.000	1	6.491	0.041	0.000	1.04		61.7	SURCHARGED	
1.001	2	6.219	0.004	0.000	0.75		44.0	SURCHARGED	
1.002	3	6.258	0.243	0.000	0.62		33.2	SURCHARGED	
1.003	1	6.266	0.311	0.000	0.83		47.7	SURCHARGED	
2.000	10	7.820	0.940	0.000	1.22		99.6	FLOOD RISK	
2.001	11	7.304	0.734	4.140	1.26		100.3	FLOOD	3
2.002	12	6.930	0.700	0.049	1.32		102.5	FLOOD	2
2.003	13	6.589	0.589	0.000	1.06		104.9	FLOOD RISK	
3.000	6	6.039	0.289	0.000	1.18		14.1	SURCHARGED	
4.000	7	6.455	0.155	0.000	0.93		55.0	SURCHARGED	
4.001	8	6.418	0.353	0.000	0.84		49.3	SURCHARGED	
4.002	9	6.334	0.449	0.000	0.86		48.3	SURCHARGED	
1.004	7	6.468	0.643	0.000	1.58		108.7	FLOOD RISK	
5.000	14	6.045	-0.030	0.000	0.15		21.8	OK	
5.001	15	6.087	0.407	0.000	1.28		18.5	SURCHARGED	
1.005	14	6.581	0.801	0.000	1.29		110.8	FLOOD RISK	
1.006	8	6.691	0.991	11.767	0.95		116.2	FLOOD	3

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for OUTFALL 900.SWS

US/MH		Return Climate		First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Level
							Act.	(m)
1.007	9	15 Winter	100	+30%	30/15 Summer	100/15 Winter		6.800
1.008	10	15 Winter	100	+30%	1/15 Summer			6.791
6.000	11	15 Winter	100	+30%	1/15 Summer			6.854
7.000	12	15 Winter	100	+30%	30/15 Summer	100/15 Summer		7.306
6.001	13	15 Winter	100	+30%	1/15 Summer			6.838
1.009	14	15 Winter	100	+30%	1/15 Summer			6.778
8.000	15	15 Winter	100	+30%	1/15 Summer	100/15 Winter		7.401
1.010	16	15 Winter	100	+30%	1/15 Summer			5.884

US/MH		Surcharged Flooded		Pipe		Level	
PN	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
							Exceeded
1.007	9	1.200	0.218	0.96		116.1	FLOOD
1.008	10	1.266	0.000	0.44		116.4	SURCHARGED
6.000	11	1.554	0.000	0.78		186.4	SURCHARGED
7.000	12	1.281	6.013	1.21		48.9	FLOOD
6.001	13	1.563	0.000	0.81		252.2	SURCHARGED
1.009	14	1.588	0.000	1.75		801.1	SURCHARGED
8.000	15	2.201	1.171	2.12		687.8	FLOOD
1.010	16	0.684	0.000	1.54		1475.1	SURCHARGED