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Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 4 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW 04

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	21.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.423	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits


Network Design Table for SW 04

« - Indicates pipe capacity < flow









PN	Length	Fall	Slope	I.Area	T.E.	Base	k	HYD	DIA	Section	Type	Auto
	(m)	(m)	(1:X)	(ha)	(mins)	Flow (l/s)	(mm)	SECT	(mm)			Design

Network Results Table

PN	Rain	T.C.	US/IL	Σ I.Area	Σ Base	Foul	Add Flow	Vel	Cap	Flow
	(mm/hr)	(mins)	(m)	(ha)	Flow (l/s)	(l/s)	(l/s)	(m/s)	(l/s)	(l/s)


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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.000	9.150	0.149	61.4	0.249	4.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	55.651	1.263	44.1	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.002	84.227	0.860	97.9	0.117	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	9.682	0.372	26.0	0.083	4.00	0.0	0.600	o	225	Pipe/Conduit	
2.003	10.377	0.130	79.8	0.117	0.00	0.0	0.600	o	525	Pipe/Conduit	
2.004	28.883	0.430	67.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
2.005	5.158	0.011	468.9	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
2.006	25.168	2.550	9.9	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.000	50.00	4.08	83.907	0.249	0.0	0.0	0.0	2.01	142.1	33.7
2.001	50.00	4.47	83.758	0.332	0.0	0.0	0.0	2.38	167.9	45.0
2.002	50.00	5.15	82.345	0.449	0.0	0.0	0.0	2.05	326.8	60.8
3.000	50.00	4.06	82.082	0.083	0.0	0.0	0.0	2.58	102.4	11.2
2.003	50.00	5.22	81.410	0.649	0.0	0.0	0.0	2.51	543.1	87.9
2.004	50.00	5.39	81.280	0.649	0.0	0.0	0.0	2.74	592.3	87.9
2.005	50.00	5.48	80.850	0.649	0.0	0.0	0.0	1.03	222.5	87.9
2.006	50.00	5.54	80.840	0.649	0.0	0.0	0.0	7.16	1549.7	87.9


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Network Design Table for SW 04






PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.000	40.165	0.236	170.0	0.083	12.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	38.354	0.157	245.0	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	26.501	0.108	245.0	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	33.112	0.485	68.3	0.085	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.000	7.729	0.245	31.5	0.150	4.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	21.299	0.904	23.6	0.083	12.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	36.66	12.67	88.700	0.083	0.0	0.0	0.0	1.00	39.8	8.2
4.001	35.64	13.31	88.446	0.166	0.0	0.0	0.0	1.00	70.7	16.0
4.002	34.97	13.75	88.318	0.249	0.0	0.0	0.0	1.00	70.7	23.6
4.003	34.54	14.04	88.230	0.334	0.0	0.0	0.0	1.91	134.7	31.2
5.000	50.00	4.06	94.800	0.150	0.0	0.0	0.0	2.34	92.9	20.3
6.000	37.58	12.13	95.459	0.083	0.0	0.0	0.0	2.71	107.6	8.4


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Network Design Table for SW 04








PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
5.001	56.881	0.289	196.8	0.083	0.00	0.0	0.600	o	525	Pipe/Conduit	
7.000	10.342	0.148	69.9	0.166	4.00	0.0	0.600	o	375	Pipe/Conduit	
5.002	67.790	1.496	45.3	0.097	0.00	0.0	0.600	o	525	Pipe/Conduit	
8.000	10.979	0.046	238.7	0.166	4.00	0.0	0.600	o	300	Pipe/Conduit	
5.003	49.341	1.811	27.2	0.067	0.00	0.0	0.600	o	525	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
5.001	36.57	12.73	94.255	0.316	0.0	0.0	0.0	1.59	344.9	31.3
7.000	50.00	4.08	94.264	0.166	0.0	0.0	0.0	2.17	239.7	22.5
5.002	36.02	13.07	93.966	0.579	0.0	0.0	0.0	3.33	721.7	56.5
8.000	50.00	4.18	92.741	0.166	0.0	0.0	0.0	1.01	71.6	22.5
5.003	35.72	13.26	92.470	0.812	0.0	0.0	0.0	4.30	931.6	78.5


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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
9.000	7.001	0.041	170.8	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.004	14.219	0.029	495.0	0.117	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.005	36.140	1.228	29.4	0.160	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.006	15.916	0.644	24.7	0.117	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.007	19.474	1.286	15.1	0.083	0.00	0.0	0.600	o	600	Pipe/Conduit	
10.000	13.499	0.079	170.9	0.143	12.00	0.0	0.600	o	225	Pipe/Conduit	
5.008	23.018	0.152	151.4	0.217	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
9.000	50.00	4.12	91.000	0.000	0.0	0.0	0.0	1.00	39.7	0.0
5.004	35.35	13.49	90.659	0.929	0.0	0.0	0.0	1.00	216.5	88.9
5.005	35.13	13.64	90.630	1.089	0.0	0.0	0.0	4.14	896.2	103.6
5.006	35.05	13.69	89.327	1.206	0.0	0.0	0.0	4.91	1388.8	114.5
5.007	34.98	13.74	88.683	1.289	0.0	0.0	0.0	6.28	1775.3	122.1
10.000	37.41	12.23	87.851	0.143	0.0	0.0	0.0	1.00	39.7	14.5
5.008	34.69	13.94	87.597	1.649	0.0	0.0	0.0	1.98	558.9	154.9


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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.004	16.645	0.397	41.9	0.083	0.00	0.0	0.600	o	600	Pipe/Conduit	
4.005	36.008	1.588	22.7	0.083	0.00	0.0	0.600	o	600	Pipe/Conduit	
4.006	37.339	0.275	135.8	0.083	0.00	0.0	0.600	oo	525	Double Pipe	
4.007	21.463	0.161	133.3	0.086	0.00	0.0	0.600	oo	525	Double Pipe	
4.008	30.800	0.399	77.2	0.040	0.00	0.0	0.600	oo	525	Double Pipe	
4.009	13.782	0.020	689.1	0.647	0.00	0.0	0.600	oo	600	Double Pipe	
4.010	21.047	0.050	420.9	0.000	0.00	0.0	0.600	oo	600	Double Pipe	
4.011	13.098	0.080	163.7	0.000	0.00	0.0	0.600	oo	600	Double Pipe	
4.012	6.013	0.010	601.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.004	34.44	14.11	87.445	2.066	0.0	0.0	0.0	3.77	1065.4	192.7
4.005	34.27	14.23	87.048	2.149	0.0	0.0	0.0	5.13	1450.1	199.5
4.006	33.82	14.55	85.460	2.232	0.0	0.0	0.0	1.92	831.5	204.4
4.007	33.57	14.74	85.185	2.318	0.0	0.0	0.0	1.94	839.2	210.7
4.008	33.30	14.94	85.024	2.358	0.0	0.0	0.0	2.55	1104.6	212.6
4.009	32.97	15.19	84.550	3.005	0.0	0.0	0.0	0.92	520.3	268.3
4.010	32.59	15.49	84.530	3.005	0.0	0.0	0.0	1.18	667.6	268.3
4.011	32.45	15.60	84.480	3.005	0.0	0.0	0.0	1.90	1074.7	268.3
4.012	32.32	15.70	84.400	3.005	0.0	0.0	0.0	0.99	278.7	268.3


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Network Design Table for SW 04








PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.013	28.027	0.690	40.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	10.115	0.077	131.4	0.345	4.00	0.0	0.600	o	525	Pipe/Conduit	
12.000	28.615	0.951	30.1	0.069	12.00	0.0	0.600	o	225	Pipe/Conduit	
12.001	20.692	1.726	12.0	0.069	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.000	36.063	0.147	245.0	0.083	12.00	0.0	0.600	o	300	Pipe/Conduit	
13.001	19.035	0.078	245.0	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
13.002	20.799	0.085	245.0	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.013	32.04	15.93	84.390	3.005	0.0	0.0	0.0	2.06	81.9	268.3
11.000	50.00	4.09	86.643	0.345	0.0	0.0	0.0	1.95	422.7	46.7
12.000	37.46	12.20	91.044	0.069	0.0	0.0	0.0	2.39	95.2	7.0
12.001	37.30	12.29	90.093	0.138	0.0	0.0	0.0	3.80	151.1	13.9
13.000	36.78	12.60	89.899	0.083	0.0	0.0	0.0	1.00	70.7	8.3
13.001	36.25	12.92	89.752	0.166	0.0	0.0	0.0	1.00	70.7	16.3
13.002	35.71	13.26	89.674	0.249	0.0	0.0	0.0	1.00	70.7	24.1


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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
13.003	91.554	0.374	245.0	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
13.004	31.329	0.104	301.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
13.005	30.920	0.103	300.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
13.006	7.914	0.845	9.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
12.002	60.277	0.932	64.7	0.069	0.00	0.0	0.600	o	375	Pipe/Conduit	
14.000	57.418	0.310	185.2	0.069	12.00	0.0	0.600	o	225	Pipe/Conduit	
12.003	40.427	0.181	223.4	0.069	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
13.003	33.50	14.79	89.589	0.332	0.0	0.0	0.0	1.00	70.7	30.1
13.004	32.84	15.29	89.141	0.332	0.0	0.0	0.0	1.04	114.7	30.1
13.005	32.22	15.79	89.037	0.332	0.0	0.0	0.0	1.04	114.9	30.1
13.006	32.19	15.81	88.934	0.332	0.0	0.0	0.0	5.95	657.2	30.1
12.002	31.65	16.26	88.217	0.539	0.0	0.0	0.0	2.26	249.2	46.2
14.000	36.12	13.00	87.745	0.069	0.0	0.0	0.0	0.96	38.1	6.8
12.003	31.08	16.75	87.210	0.677	0.0	0.0	0.0	1.36	215.7	57.0


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12.004	22.676	0.400	56.7	0.069	0.00	0.0	0.600	o	525	Pipe/Conduit	🔒
11.001	40.898	0.267	153.2	0.069	0.00	0.0	0.600	oo	375	Double Pipe	🔒
11.002	14.503	0.050	290.1	0.069	0.00	0.0	0.600	oo	375	Double Pipe	🔒
11.003	23.711	0.262	90.5	0.000	0.00	0.0	0.600	oo	375	Double Pipe	🔒
11.004	36.176	0.438	82.6	0.000	0.00	0.0	0.600	oo	450	Double Pipe	🔒
11.005	4.574	0.010	457.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	🔒
11.006	16.040	1.692	9.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
15.000	36.910	0.631	58.5	0.000	12.00	0.0	0.600	o	225	Pipe/Conduit	🔒

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.004	30.94	16.88	86.967	0.746	0.0	0.0	0.0	2.98	645.0	62.5
11.001	30.43	17.35	86.567	1.160	0.0	0.0	0.0	1.46	322.9	95.6
11.002	30.18	17.57	86.300	1.229	0.0	0.0	0.0	1.06	233.9	100.5
11.003	29.97	17.78	86.250	1.229	0.0	0.0	0.0	1.91	420.9	100.5
11.004	29.69	18.05	85.913	1.229	0.0	0.0	0.0	2.24	712.0	100.5
11.005	29.62	18.12	85.400	1.229	0.0	0.0	0.0	1.04	225.3	100.5
11.006	29.55	18.19	85.390	1.229	0.0	0.0	0.0	4.28	170.0	100.5
15.000	37.18	12.36	90.590	0.000	0.0	0.0	0.0	1.71	68.1	0.0


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15.001	33.818	0.474	71.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
15.002	21.572	0.129	167.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
15.003	76.754	0.384	199.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
15.004	12.791	0.064	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	


Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
15.001	36.57	12.72	89.959	0.000	0.0	0.0	0.0	1.55	61.6	0.0
15.002	36.00	13.08	89.485	0.000	0.0	0.0	0.0	1.01	40.1	0.0
15.003	33.94	14.47	89.356	0.000	0.0	0.0	0.0	0.92	36.6	0.0
15.004	33.62	14.70	88.973	0.000	0.0	0.0	0.0	0.92	36.6	0.0

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Manhole Schedules for SW 04

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S4.01	86.107	2.200	Open Manhole	1200	2.000	83.907	300				
S4.02	86.176	2.418	Open Manhole	1200	2.001	83.758	300	2.000	83.758	300	
S4.03	84.297	1.952	Open Manhole	1350	2.002	82.345	450	2.001	82.495	300	
S4.04	83.465	1.383	Open Manhole	1200	3.000	82.082	225				
S4.05	83.261	1.851	Open Manhole	1500	2.003	81.410	525	2.002	81.485	450	
								3.000	81.710	225	
S4.06	82.435	1.155	Open Manhole	1500	2.004	81.280	525	2.003	81.280	525	
S4.07	82.650	1.800	Open Manhole	1500	2.005	80.850	525	2.004	80.850	525	
S4.08 FC	82.650	1.811	Open Manhole	1800	2.006	80.840	525	2.005	80.839	525	
S4.01	79.550	1.260	Open Manhole	0		OUTFALL		2.006	78.290	525	
S4.09	90.125	1.425	Open Manhole	900	4.000	88.700	225				
S4.10	90.435	1.989	Open Manhole	1200	4.001	88.446	300	4.000	88.464	225	
S4.11	90.204	1.915	Open Manhole	900	4.002	88.318	300	4.001	88.289	300	
S4.12	89.923	1.713	Open Manhole	1200	4.003	88.230	300	4.002	88.210	300	
S4.13	97.364	2.564	Open Manhole	1200	5.000	94.800	225				
S4.14	97.214	1.755	Open Manhole	1200	6.000	95.459	225				
S4.15	97.428	3.173	Open Manhole	1500	5.001	94.255	525	5.000	94.555	225	
								6.000	94.555	225	

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Manhole Schedules for SW 04

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S4.16	96.750	2.486	Open Manhole	1350	7.000	94.264	375				
S4.17	97.086	3.120	Open Manhole	1500	5.002	93.966	525	5.001	93.966	525	
								7.000	94.116	375	
S4.18	95.188	2.447	Open Manhole	1200	8.000	92.741	300				
S4.19	95.290	2.820	Open Manhole	1500	5.003	92.470	525	5.002	92.470	525	
								8.000	92.695	300	
S4.20	93.030	2.030	Open Manhole	1200	9.000	91.000	225				
S4.21	93.334	2.675	Open Manhole	1500	5.004	90.659	525	5.003	90.659	525	
								9.000	90.959	225	
S4.22	92.773	2.143	Open Manhole	1500	5.005	90.630	525	5.004	90.630	525	
S4.23	91.327	1.999	Open Manhole	1500	5.006	89.327	600	5.005	89.402	525	
S4.24	90.683	1.999	Open Manhole	1500	5.007	88.683	600	5.006	88.683	600	
S4.25	89.573	1.722	Open Manhole	1200	10.000	87.851	225				
S4.26	89.930	2.533	Open Manhole	1500	5.008	87.597	600	5.007	87.397	600	
								10.000	87.772	225	
S4.27	89.173	1.728	Open Manhole	1500	4.004	87.445	600	4.003	87.745	300	
								5.008	87.445	600	
S4.28	88.580	1.532	Open Manhole	1500	4.005	87.048	600	4.004	87.048	600	
S4.29	87.316	1.856	Open Manhole	1950	4.006	85.460	525	4.005	85.460	600	

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Manhole Schedules for SW 04

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)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S4.30	87.100	1.915	Open Manhole	1950	4.007	85.185	525	4.006	85.185	525	
S4.31	87.100	2.076	Open Manhole	1950	4.008	85.024	525	4.007	85.024	525	
S4.32	86.638	2.088	Open Manhole	2100	4.009	84.550	600	4.008	84.625	525	
S4.33	86.200	1.670	Open Manhole	2100	4.010	84.530	600	4.009	84.530	600	
S4.34	86.200	1.720	Open Manhole	2100	4.011	84.480	600	4.010	84.480	600	
S4.35	86.200	1.800	Open Manhole	2100	4.012	84.400	600	4.011	84.400	600	
S4.36 FC	86.200	1.810	Open Manhole	1800	4.013	84.390	225	4.012	84.390	600	
S4.02	83.931	0.231	Open Manhole	1350		OUTFALL		4.013	83.700	225	
S4.37	87.928	1.285	Open Manhole	1500	11.000	86.643	525				
S4.38	92.469	1.425	Open Manhole	1200	12.000	91.044	225				
S4.39	91.518	1.425	Open Manhole	1200	12.001	90.093	225	12.000	90.093	225	
S4.40	91.399	1.500	Open Manhole	900	13.000	89.899	300				
S4.41	92.361	2.609	Open Manhole	1200	13.001	89.752	300	13.000	89.752	300	
S4.42	92.761	3.087	Open Manhole	900	13.002	89.674	300	13.001	89.674	300	
S4.43	92.704	3.115	Open Manhole	1200	13.003	89.589	300	13.002	89.589	300	
S4.44	91.790	2.650	Open Manhole	1350	13.004	89.141	375	13.003	89.216	300	
S4.45	91.286	2.249	Open Manhole	1350	13.005	89.037	375	13.004	89.037	375	
S4.46	90.678	1.744	Open Manhole	1350	13.006	88.934	375	13.005	88.934	375	

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Manhole Schedules for SW 04

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S4.47	90.767	2.679	Open Manhole	1350	12.002	88.217	375	12.001	88.367	225	
								13.006	88.089	375	
S4.48	89.800	2.055	Open Manhole	1200	14.000	87.745	225				
S4.49	89.715	2.505	Open Manhole	1350	12.003	87.210	450	12.002	87.285	375	
								14.000	87.435	225	
S4.50	88.186	1.219	Open Manhole	1500	12.004	86.967	525	12.003	87.029	450	
S4.51	87.771	1.205	Open Manhole	1800	11.001	86.567	375	11.000	86.566	525	
								12.004	86.567	525	
S4.52	87.080	0.780	Open Manhole	1800	11.002	86.300	375	11.001	86.300	375	
S4.53	86.874	0.624	Open Manhole	1800	11.003	86.250	375	11.002	86.250	375	
S4.54	86.400	0.487	Open Manhole	1800	11.004	85.913	450	11.003	85.988	375	
S4.55	86.400	1.000	Open Manhole	1800	11.005	85.400	525	11.004	85.475	450	
S4.56 FC	86.400	1.010	Open Manhole	1800	11.006	85.390	225	11.005	85.390	525	
S4.03	86.000	2.302	Open Manhole	2250		OUTFALL		11.006	83.698	225	
S4.57	92.015	1.425	Open Manhole	900	15.000	90.590	225				
S4.58	91.444	1.485	Open Manhole	1200	15.001	89.959	225	15.000	89.959	225	
S4.59	90.910	1.425	Open Manhole	900	15.002	89.485	225	15.001	89.485	225	
S4.60	91.000	1.644	Open Manhole	900	15.003	89.356	225	15.002	89.356	225	

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Manhole Schedules for SW 04

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)
S4.61	89.540	0.568	Open Manhole	1200	15.004	88.973	225	15.003	88.972	225	
S4.04	89.443	0.534	Open Manhole	0		OUTFALL		15.004	88.909	225	

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PIPELINE SCHEDULES for SW 04

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)
2.000	o	300	S4.01	86.107	83.907	1.900	Open Manhole	1200
2.001	o	300	S4.02	86.176	83.758	2.118	Open Manhole	1200
2.002	o	450	S4.03	84.297	82.345	1.502	Open Manhole	1350
3.000	o	225	S4.04	83.465	82.082	1.158	Open Manhole	1200
2.003	o	525	S4.05	83.261	81.410	1.326	Open Manhole	1500
2.004	o	525	S4.06	82.435	81.280	0.630	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)
2.000	9.150	61.4	S4.02	86.176	83.758	2.118	Open Manhole	1200
2.001	55.651	44.1	S4.03	84.297	82.495	1.502	Open Manhole	1350
2.002	84.227	97.9	S4.05	83.261	81.485	1.326	Open Manhole	1500
3.000	9.682	26.0	S4.05	83.261	81.710	1.326	Open Manhole	1500
2.003	10.377	79.8	S4.06	82.435	81.280	0.630	Open Manhole	1500
2.004	28.883	67.2	S4.07	82.650	80.850	1.275	Open Manhole	1500

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PIPELINE SCHEDULES for SW 04

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)
2.005	o	525	S4.07	82.650	80.850	1.275	Open Manhole	1500
2.006	o	525	S4.08 FC	82.650	80.840	1.285	Open Manhole	1800
4.000	o	225	S4.09	90.125	88.700	1.200	Open Manhole	900
4.001	o	300	S4.10	90.435	88.446	1.689	Open Manhole	1200
4.002	o	300	S4.11	90.204	88.318	1.586	Open Manhole	900
4.003	o	300	S4.12	89.923	88.230	1.393	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)
2.005	5.158	468.9	S4.08 FC	82.650	80.839	1.286	Open Manhole	1800
2.006	25.168	9.9	S4.01	79.550	78.290	0.735	Open Manhole	0
4.000	40.165	170.0	S4.10	90.435	88.464	1.746	Open Manhole	1200
4.001	38.354	245.0	S4.11	90.204	88.289	1.615	Open Manhole	900
4.002	26.501	245.0	S4.12	89.923	88.210	1.413	Open Manhole	1200
4.003	33.112	68.3	S4.27	89.173	87.745	1.128	Open Manhole	1500

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PIPELINE SCHEDULES for SW 04

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	225	S4.13	97.364	94.800	2.339	Open Manhole	1200
6.000	o	225	S4.14	97.214	95.459	1.530	Open Manhole	1200
5.001	o	525	S4.15	97.428	94.255	2.648	Open Manhole	1500
7.000	o	375	S4.16	96.750	94.264	2.111	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)
5.000	7.729	31.5	S4.15	97.428	94.555	2.648	Open Manhole	1500
6.000	21.299	23.6	S4.15	97.428	94.555	2.648	Open Manhole	1500
5.001	56.881	196.8	S4.17	97.086	93.966	2.595	Open Manhole	1500
7.000	10.342	69.9	S4.17	97.086	94.116	2.595	Open Manhole	1500

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PIPELINE SCHEDULES for SW 04

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)
5.002	o	525	S4.17	97.086	93.966	2.595	Open Manhole	1500
8.000	o	300	S4.18	95.188	92.741	2.147	Open Manhole	1200
5.003	o	525	S4.19	95.290	92.470	2.295	Open Manhole	1500
9.000	o	225	S4.20	93.030	91.000	1.805	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)
5.002	67.790	45.3	S4.19	95.290	92.470	2.295	Open Manhole	1500
8.000	10.979	238.7	S4.19	95.290	92.695	2.295	Open Manhole	1500
5.003	49.341	27.2	S4.21	93.334	90.659	2.150	Open Manhole	1500
9.000	7.001	170.8	S4.21	93.334	90.959	2.150	Open Manhole	1500

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PIPELINE SCHEDULES for SW 04

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)
5.004	o	525	S4.21	93.334	90.659	2.150	Open Manhole	1500
5.005	o	525	S4.22	92.773	90.630	1.618	Open Manhole	1500
5.006	o	600	S4.23	91.327	89.327	1.399	Open Manhole	1500
5.007	o	600	S4.24	90.683	88.683	1.399	Open Manhole	1500
10.000	o	225	S4.25	89.573	87.851	1.497	Open Manhole	1200
5.008	o	600	S4.26	89.930	87.597	1.733	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)
5.004	14.219	495.0	S4.22	92.773	90.630	1.618	Open Manhole	1500
5.005	36.140	29.4	S4.23	91.327	89.402	1.399	Open Manhole	1500
5.006	15.916	24.7	S4.24	90.683	88.683	1.399	Open Manhole	1500
5.007	19.474	15.1	S4.26	89.930	87.397	1.933	Open Manhole	1500
10.000	13.499	170.9	S4.26	89.930	87.772	1.933	Open Manhole	1500
5.008	23.018	151.4	S4.27	89.173	87.445	1.128	Open Manhole	1500

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PIPELINE SCHEDULES for SW 04

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.004	o	600	S4.27	89.173	87.445	1.128	Open Manhole	1500
4.005	o	600	S4.28	88.580	87.048	0.932	Open Manhole	1500
4.006	oo	525	S4.29	87.316	85.460	1.331	Open Manhole	1950
4.007	oo	525	S4.30	87.100	85.185	1.390	Open Manhole	1950
4.008	oo	525	S4.31	87.100	85.024	1.551	Open Manhole	1950
4.009	oo	600	S4.32	86.638	84.550	1.488	Open Manhole	2100
4.010	oo	600	S4.33	86.200	84.530	1.070	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)
4.004	16.645	41.9	S4.28	88.580	87.048	0.932	Open Manhole	1500
4.005	36.008	22.7	S4.29	87.316	85.460	1.256	Open Manhole	1950
4.006	37.339	135.8	S4.30	87.100	85.185	1.390	Open Manhole	1950
4.007	21.463	133.3	S4.31	87.100	85.024	1.551	Open Manhole	1950
4.008	30.800	77.2	S4.32	86.638	84.625	1.488	Open Manhole	2100
4.009	13.782	689.1	S4.33	86.200	84.530	1.070	Open Manhole	2100
4.010	21.047	420.9	S4.34	86.200	84.480	1.120	Open Manhole	2100

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PIPELINE SCHEDULES for SW 04

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.011	oo	600	S4.34	86.200	84.480	1.120	Open Manhole	2100
4.012	o	600	S4.35	86.200	84.400	1.200	Open Manhole	2100
4.013	o	225	S4.36 FC	86.200	84.390	1.585	Open Manhole	1800
11.000	o	525	S4.37	87.928	86.643	0.760	Open Manhole	1500
12.000	o	225	S4.38	92.469	91.044	1.200	Open Manhole	1200
12.001	o	225	S4.39	91.518	90.093	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.011	13.098	163.7	S4.35	86.200	84.400	1.200	Open Manhole	2100
4.012	6.013	601.3	S4.36 FC	86.200	84.390	1.210	Open Manhole	1800
4.013	28.027	40.6	S4.02	83.931	83.700	0.006	Open Manhole	1350
11.000	10.115	131.4	S4.51	87.771	86.566	0.680	Open Manhole	1800
12.000	28.615	30.1	S4.39	91.518	90.093	1.200	Open Manhole	1200
12.001	20.692	12.0	S4.47	90.767	88.367	2.175	Open Manhole	1350

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PIPELINE SCHEDULES for SW 04

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)
13.000	o	300	S4.40	91.399	89.899	1.200	Open Manhole	900
13.001	o	300	S4.41	92.361	89.752	2.309	Open Manhole	1200
13.002	o	300	S4.42	92.761	89.674	2.787	Open Manhole	900
13.003	o	300	S4.43	92.704	89.589	2.815	Open Manhole	1200
13.004	o	375	S4.44	91.790	89.141	2.275	Open Manhole	1350
13.005	o	375	S4.45	91.286	89.037	1.874	Open Manhole	1350
13.006	o	375	S4.46	90.678	88.934	1.369	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)
13.000	36.063	245.0	S4.41	92.361	89.752	2.309	Open Manhole	1200
13.001	19.035	245.0	S4.42	92.761	89.674	2.787	Open Manhole	900
13.002	20.799	245.0	S4.43	92.704	89.589	2.815	Open Manhole	1200
13.003	91.554	245.0	S4.44	91.790	89.216	2.275	Open Manhole	1350
13.004	31.329	301.2	S4.45	91.286	89.037	1.874	Open Manhole	1350
13.005	30.920	300.2	S4.46	90.678	88.934	1.369	Open Manhole	1350
13.006	7.914	9.4	S4.47	90.767	88.089	2.304	Open Manhole	1350

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PIPELINE SCHEDULES for SW 04

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)
12.002	o	375	S4.47	90.767	88.217	2.175	Open Manhole	1350
14.000	o	225	S4.48	89.800	87.745	1.830	Open Manhole	1200
12.003	o	450	S4.49	89.715	87.210	2.055	Open Manhole	1350
12.004	o	525	S4.50	88.186	86.967	0.694	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)
12.002	60.277	64.7	S4.49	89.715	87.285	2.055	Open Manhole	1350
14.000	57.418	185.2	S4.49	89.715	87.435	2.055	Open Manhole	1350
12.003	40.427	223.4	S4.50	88.186	87.029	0.707	Open Manhole	1500
12.004	22.676	56.7	S4.51	87.771	86.567	0.679	Open Manhole	1800

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PIPELINE SCHEDULES for SW 04

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)
11.001	oo	375	S4.51	87.771	86.567	0.829	Open Manhole	1800
11.002	oo	375	S4.52	87.080	86.300	0.405	Open Manhole	1800
11.003	oo	375	S4.53	86.874	86.250	0.249	Open Manhole	1800
11.004	oo	450	S4.54	86.400	85.913	0.037	Open Manhole	1800
11.005	o	525	S4.55	86.400	85.400	0.475	Open Manhole	1800
11.006	o	225	S4.56 FC	86.400	85.390	0.785	Open Manhole	1800
15.000	o	225	S4.57	92.015	90.590	1.200	Open Manhole	900

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)
11.001	40.898	153.2	S4.52	87.080	86.300	0.405	Open Manhole	1800
11.002	14.503	290.1	S4.53	86.874	86.250	0.249	Open Manhole	1800
11.003	23.711	90.5	S4.54	86.400	85.988	0.037	Open Manhole	1800
11.004	36.176	82.6	S4.55	86.400	85.475	0.475	Open Manhole	1800
11.005	4.574	457.4	S4.56 FC	86.400	85.390	0.485	Open Manhole	1800
11.006	16.040	9.5	S4.03	86.000	83.698	2.077	Open Manhole	2250
15.000	36.910	58.5	S4.58	91.444	89.959	1.260	Open Manhole	1200

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PIPELINE SCHEDULES for SW 04

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)
15.001	o	225	S4.58	91.444	89.959	1.260	Open Manhole	1200
15.002	o	225	S4.59	90.910	89.485	1.200	Open Manhole	900
15.003	o	225	S4.60	91.000	89.356	1.419	Open Manhole	900
15.004	o	225	S4.61	89.540	88.973	0.342	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)
15.001	33.818	71.3	S4.59	90.910	89.485	1.200	Open Manhole	900
15.002	21.572	167.2	S4.60	91.000	89.356	1.419	Open Manhole	900
15.003	76.754	199.9	S4.61	89.540	88.972	0.343	Open Manhole	1200
15.004	12.791	200.0	S4.04	89.443	88.909	0.309	Open Manhole	0

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Area Summary for SW 04

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
2.000	-	-	100	0.249	0.249	0.249
2.001	-	-	100	0.083	0.083	0.083
2.002	-	-	100	0.117	0.117	0.117
3.000	-	-	100	0.083	0.083	0.083
2.003	-	-	100	0.117	0.117	0.117
2.004	-	-	100	0.000	0.000	0.000
2.005	-	-	100	0.000	0.000	0.000
2.006	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.083	0.083	0.083
4.001	-	-	100	0.083	0.083	0.083
4.002	-	-	100	0.083	0.083	0.083
4.003	-	-	100	0.085	0.085	0.085
5.000	-	-	100	0.150	0.150	0.150
6.000	-	-	100	0.083	0.083	0.083
5.001	-	-	100	0.083	0.083	0.083
7.000	-	-	100	0.166	0.166	0.166
5.002	-	-	100	0.097	0.097	0.097
8.000	-	-	100	0.166	0.166	0.166
5.003	-	-	100	0.067	0.067	0.067
9.000	-	-	100	0.000	0.000	0.000
5.004	-	-	100	0.117	0.117	0.117
5.005	-	-	100	0.160	0.160	0.160
5.006	-	-	100	0.117	0.117	0.117
5.007	-	-	100	0.083	0.083	0.083
10.000	-	-	100	0.143	0.143	0.143
5.008	-	-	100	0.217	0.217	0.217

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Area Summary for SW 04

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
4.004	-	-	100	0.083	0.083	0.083
4.005	-	-	100	0.083	0.083	0.083
4.006	-	-	100	0.083	0.083	0.083
4.007	-	-	100	0.086	0.086	0.086
4.008	-	-	100	0.040	0.040	0.040
4.009	-	-	100	0.647	0.647	0.647
4.010	-	-	100	0.000	0.000	0.000
4.011	-	-	100	0.000	0.000	0.000
4.012	-	-	100	0.000	0.000	0.000
4.013	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.345	0.345	0.345
12.000	-	-	100	0.069	0.069	0.069
12.001	-	-	100	0.069	0.069	0.069
13.000	-	-	100	0.083	0.083	0.083
13.001	-	-	100	0.083	0.083	0.083
13.002	-	-	100	0.083	0.083	0.083
13.003	-	-	100	0.083	0.083	0.083
13.004	-	-	100	0.000	0.000	0.000
13.005	-	-	100	0.000	0.000	0.000
13.006	-	-	100	0.000	0.000	0.000
12.002	-	-	100	0.069	0.069	0.069
14.000	-	-	100	0.069	0.069	0.069
12.003	-	-	100	0.069	0.069	0.069
12.004	-	-	100	0.069	0.069	0.069
11.001	-	-	100	0.069	0.069	0.069
11.002	-	-	100	0.069	0.069	0.069


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Area Summary for SW 04

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
11.003	-	-	100	0.000	0.000	0.000
11.004	-	-	100	0.000	0.000	0.000
11.005	-	-	100	0.000	0.000	0.000
11.006	-	-	100	0.000	0.000	0.000
15.000	-	-	100	0.000	0.000	0.000
15.001	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
15.003	-	-	100	0.000	0.000	0.000
15.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				4.883	4.883	4.883

Free Flowing Outfall Details for SW 04

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2.006	S4.01	79.550	78.290	0.000	0	0

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Free Flowing Outfall Details for SW 04

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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4.013	S4.02	83.931	83.700	0.000	1350 0
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Free Flowing Outfall Details for SW 04


Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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11.006	S4.03	86.000	83.698	0.000	2250 0
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Free Flowing Outfall Details for SW 04

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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15.004	S4.04	89.443	88.909	0.000	0 0
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Simulation Criteria for SW 04

Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coefficient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m ³ /ha Storage	4.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	1	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	3	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	21.000	Cv (Summer)	0.750
Return Period (years)	1	Ratio R	0.423	Cv (Winter)	0.840
Region England and Wales Profile Type			Winter Storm	Duration (mins)	15

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Online Controls for SW 04

Complex Manhole: S4.08 FC, DS/PN: 2.006, Volume (m³): 5.4


Hydro-Brake® Optimum

Unit Reference	MD-SHE-0066-2000-1100-2000	Sump Available	Yes
Design Head (m)	1.100	Diameter (mm)	66
Design Flow (l/s)	2.0	Invert Level (m)	80.840
Flush-Flo™	Calculated Minimum Outlet Pipe Diameter (mm)		100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	2.0	Kick-Flo®	0.584	1.5
Flush-Flo™	0.289	1.8	Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	0.500	1.7	1.200	2.1	2.000	2.6	3.000	3.2	5.000	4.0
0.200	1.8	0.600	1.5	1.400	2.2	2.200	2.7	3.500	3.4	5.500	4.2
0.300	1.8	0.800	1.7	1.600	2.4	2.400	2.9	4.000	3.6	6.000	4.4
0.400	1.8	1.000	1.9	1.800	2.5	2.600	3.0	4.500	3.8	6.500	4.5

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Hydro-Brake® Optimum

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
7.000	4.7	7.500	4.9	8.000	5.0	8.500	5.1	9.000	5.3	9.500	5.4

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 81.740


Complex Manhole: S4.36 FC, DS/PN: 4.013, Volume (m³): 5.8

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0105-5000-1000-5000	Sump Available	Yes
Design Head (m)	1.000	Diameter (mm)	105
Design Flow (l/s)	5.0	Invert Level (m)	84.390
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	5.0	Kick-Flo®	0.637	4.1
Flush-Flo™	0.296	5.0	Mean Flow over Head Range	-	4.3

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

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Hydro-Brake® Optimum

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	0.600	4.3	1.600	6.2	2.600	7.8	5.000	10.6	7.500	12.9
0.200	4.8	0.800	4.5	1.800	6.6	3.000	8.4	5.500	11.1	8.000	13.3
0.300	5.0	1.000	5.0	2.000	6.9	3.500	9.0	6.000	11.6	8.500	13.7
0.400	4.9	1.200	5.4	2.200	7.2	4.000	9.6	6.500	12.1	9.000	14.1
0.500	4.7	1.400	5.8	2.400	7.5	4.500	10.1	7.000	12.5	9.500	14.5

Orifice


Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 85.390

Complex Manhole: S4.56 FC, DS/PN: 11.006, Volume (m³): 3.2

Hydro-Brake® Optimum

Unit Reference MD-SHE-0087-3000-0700-3000	Sump Available	Yes
Design Head (m) 0.700	Diameter (mm)	87
Design Flow (l/s) 3.0	Invert Level (m)	85.390
Flush-Flo™	Calculated Minimum Outlet Pipe Diameter (mm)	100
Objective Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface	

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	3.0	Flush-Flo™	0.210	3.0

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Hydro-Brake® Optimum


Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Kick-Flo®	0.465	2.5	Mean Flow over Head Range	-	2.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	0.600	2.8	1.600	4.4	2.600	5.5	5.000	7.5	7.500	9.1
0.200	3.0	0.800	3.2	1.800	4.6	3.000	5.9	5.500	7.8	8.000	9.4
0.300	2.9	1.000	3.5	2.000	4.9	3.500	6.3	6.000	8.2	8.500	9.7
0.400	2.8	1.200	3.8	2.200	5.1	4.000	6.7	6.500	8.5	9.000	9.9
0.500	2.6	1.400	4.1	2.400	5.3	4.500	7.1	7.000	8.8	9.500	10.2

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 86.140

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Storage Structures for SW 04

Tank or Pond Manhole: S4.08 FC, DS/PN: 2.006

Invert Level (m) 80.850

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.0	0.500	396.0	1.000	824.0	1.500	1394.0
0.250	219.0	0.750	600.0	1.250	1094.0		

Tank or Pond Manhole: S4.36 FC, DS/PN: 4.013


Invert Level (m) 84.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.0	0.500	1020.0	1.000	2333.0	1.500	3143.0
0.250	581.0	0.750	1721.0	1.250	2790.0		

Tank or Pond Manhole: S4.56 FC, DS/PN: 11.006

Invert Level (m) 85.390

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.0	0.250	226.0	0.500	525.0	0.750	840.0	1.050	1229.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 3 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe		Status
									Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	
2.000	S4.01	15 Summer	2	+0%	100/15 Summer				84.064	-0.143	0.000	0.54	51.8	OK

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

	US/MH	Level
PN	Name	Exceeded
2.000	S4.01	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
2.001	S4.02	15	Winter	2	+0%	100/15	Summer		83.892	-0.166	0.000	0.41	65.2
2.002	S4.03	15	Winter	2	+0%				82.505	-0.290	0.000	0.27	82.6
3.000	S4.04	15	Summer	2	+0%				82.151	-0.156	0.000	0.20	17.2
2.003	S4.05	15	Winter	2	+0%	100/15	Summer		81.648	-0.287	0.000	0.42	117.2
2.004	S4.06	15	Winter	2	+0%	100/15	Winter		81.452	-0.353	0.000	0.24	116.7
2.005	S4.07	360	Winter	2	+0%	2/360	Winter		81.378	0.003	0.000	0.10	16.7
2.006	S4.08	FC 360	Winter	2	+0%	2/240	Winter		81.377	0.012	0.000	0.00	1.8
4.000	S4.09	15	Winter	2	+0%	100/15	Summer		88.778	-0.147	0.000	0.26	9.8
4.001	S4.10	15	Winter	2	+0%	100/15	Summer		88.566	-0.180	0.000	0.33	21.5
4.002	S4.11	15	Winter	2	+0%	30/15	Winter		88.475	-0.143	0.000	0.53	33.7
4.003	S4.12	15	Winter	2	+0%	100/15	Summer		88.357	-0.173	0.000	0.37	46.1
5.000	S4.13	15	Winter	2	+0%	100/15	Summer		94.905	-0.120	0.000	0.45	31.2
6.000	S4.14	15	Winter	2	+0%				95.506	-0.178	0.000	0.10	9.8
5.001	S4.15	15	Winter	2	+0%				94.400	-0.380	0.000	0.17	51.9
7.000	S4.16	15	Summer	2	+0%				94.385	-0.254	0.000	0.23	34.5
5.002	S4.17	15	Winter	2	+0%				94.103	-0.388	0.000	0.15	100.8
8.000	S4.18	15	Summer	2	+0%	30/15	Summer		92.910	-0.131	0.000	0.61	34.5
5.003	S4.19	15	Winter	2	+0%				92.618	-0.377	0.000	0.17	144.3
9.000	S4.20	15	Summer	2	+0%	30/15	Summer		91.185	-0.040	0.000	0.06	1.9
5.004	S4.21	15	Summer	2	+0%	30/15	Summer		91.184	0.000	0.000	1.29	158.0
5.005	S4.22	15	Winter	2	+0%	100/15	Winter		90.806	-0.349	0.000	0.25	188.7
5.006	S4.23	15	Winter	2	+0%	100/15	Summer		89.534	-0.394	0.000	0.26	205.8
5.007	S4.24	15	Winter	2	+0%	100/15	Summer		88.863	-0.421	0.000	0.19	216.4
10.000	S4.25	15	Winter	2	+0%	30/15	Summer	100/15 Summer	87.993	-0.083	0.000	0.53	18.3

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
2.001	S4.02	OK	
2.002	S4.03	OK	
3.000	S4.04	OK	
2.003	S4.05	OK	
2.004	S4.06	OK	
2.005	S4.07	SURCHARGED	
2.006	S4.08 FC	SURCHARGED	
4.000	S4.09	OK	
4.001	S4.10	OK	
4.002	S4.11	OK	
4.003	S4.12	OK	
5.000	S4.13	OK	
6.000	S4.14	OK	
5.001	S4.15	OK	
7.000	S4.16	OK	
5.002	S4.17	OK	
8.000	S4.18	OK	
5.003	S4.19	OK	
9.000	S4.20	OK	
5.004	S4.21	OK	
5.005	S4.22	OK	
5.006	S4.23	OK	
5.007	S4.24	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
10.000	S4.25	OK	2

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
5.008	S4.26	15 Winter	2	+0%	30/15 Summer				87.967	-0.230	0.000	0.69	268.2
4.004	S4.27	15 Winter	2	+0%	30/15 Summer				87.752	-0.293	0.000	0.52	326.7
4.005	S4.28	15 Winter	2	+0%	100/15 Summer				87.262	-0.386	0.000	0.28	337.0
4.006	S4.29	15 Winter	2	+0%	30/15 Summer	100/15 Summer			85.719	-0.266	0.000	0.48	346.5
4.007	S4.30	15 Winter	2	+0%	30/15 Summer				85.462	-0.248	0.000	0.58	359.2
4.008	S4.31	15 Winter	2	+0%	30/15 Summer				85.351	-0.198	0.000	0.37	347.0
4.009	S4.32	15 Winter	2	+0%	2/15 Summer				85.279	0.129	0.000	1.72	407.4
4.010	S4.33	360 Winter	2	+0%	2/15 Summer	100/15 Summer			85.262	0.132	0.000	0.15	74.9
4.011	S4.34	360 Winter	2	+0%	2/15 Summer	100/30 Winter			85.259	0.179	0.000	0.11	75.6
4.012	S4.35	480 Winter	2	+0%	2/15 Summer				85.167	0.167	0.000	0.29	61.7
4.013	S4.36 FC	480 Winter	2	+0%	2/15 Summer				85.167	0.552	0.000	0.07	5.0
11.000	S4.37	15 Summer	2	+0%	100/15 Summer				86.835	-0.333	0.000	0.29	71.7
12.000	S4.38	15 Winter	2	+0%					91.090	-0.179	0.000	0.09	8.2
12.001	S4.39	15 Winter	2	+0%					90.148	-0.170	0.000	0.14	18.6
13.000	S4.40	15 Winter	2	+0%	30/15 Summer				89.976	-0.223	0.000	0.15	9.8
13.001	S4.41	15 Winter	2	+0%	30/15 Summer				89.883	-0.168	0.000	0.35	21.6
13.002	S4.42	15 Winter	2	+0%	30/15 Summer				89.834	-0.140	0.000	0.55	34.1
13.003	S4.43	15 Winter	2	+0%	30/15 Summer				89.772	-0.118	0.000	0.64	43.8
13.004	S4.44	15 Winter	2	+0%	100/15 Summer				89.312	-0.203	0.000	0.43	43.6
13.005	S4.45	15 Winter	2	+0%	100/15 Summer				89.207	-0.204	0.000	0.42	43.2
13.006	S4.46	15 Winter	2	+0%					89.019	-0.289	0.000	0.12	43.1
12.002	S4.47	15 Winter	2	+0%					88.352	-0.240	0.000	0.28	64.7
14.000	S4.48	15 Winter	2	+0%	100/15 Summer				87.817	-0.153	0.000	0.22	8.2
12.003	S4.49	15 Winter	2	+0%	100/15 Summer				87.413	-0.247	0.000	0.42	79.8

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
5.008	S4.26	OK	
4.004	S4.27	OK	
4.005	S4.28	OK	
4.006	S4.29	OK	4
4.007	S4.30	OK	
4.008	S4.31	OK	
4.009	S4.32	SURCHARGED	
4.010	S4.33	SURCHARGED	6
4.011	S4.34	SURCHARGED	2
4.012	S4.35	SURCHARGED	
4.013	S4.36 FC	SURCHARGED	
11.000	S4.37	OK	
12.000	S4.38	OK	
12.001	S4.39	OK	
13.000	S4.40	OK	
13.001	S4.41	OK	
13.002	S4.42	OK	
13.003	S4.43	OK	
13.004	S4.44	OK	
13.005	S4.45	OK	
13.006	S4.46	OK	
12.002	S4.47	OK	
14.000	S4.48	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04


PN	US/MH Name	Status	Level Exceeded
12.003	S4.49	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)				
									Level (m)	Depth (m)	Volume (m ³)						
12.004	S4.50	15	Winter	2	+0%	100/15	Summer		87.117	-0.375	0.000	0.18					
11.001	S4.51	15	Winter	2	+0%	30/15	Summer		86.755	-0.187	0.000	0.50					
11.002	S4.52	15	Winter	2	+0%	30/15	Summer		86.572	-0.103	0.000	0.82					
11.003	S4.53	15	Winter	2	+0%	100/15	Summer		86.420	-0.205	0.000	0.43					
11.004	S4.54	15	Winter	2	+0%	100/15	Summer	100/15	Winter	86.061	-0.302	0.000	0.25				
11.005	S4.55	240	Winter	2	+0%	2/60	Summer		85.980	0.055	0.000	0.27					
11.006	S4.56	FC	240	Winter	2	+0%	2/15	Summer		2/60	Winter	49	85.978	0.363	0.000	0.02	17.8
15.000	S4.57	60	Winter	2	+0%				90.590	-0.225	0.000	0.00					
15.001	S4.58	60	Winter	2	+0%				89.959	-0.225	0.000	0.00					
15.002	S4.59	60	Winter	2	+0%				89.485	-0.225	0.000	0.00					
15.003	S4.60	60	Winter	2	+0%				89.356	-0.225	0.000	0.00					
15.004	S4.61	60	Winter	2	+0%				88.972	-0.226	0.000	0.00					

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
12.004	S4.50	86.8	OK	
11.001	S4.51	146.1	OK	
11.002	S4.52	153.3	OK	
11.003	S4.53	154.2	OK	
11.004	S4.54	154.1	OK	5
11.005	S4.55	43.4	SURCHARGED	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Pipe	Status	Level Exceeded
		Flow (l/s)		
11.006	S4.56 FC	3.0	SURCHARGED	
15.000	S4.57	0.0	OK	
15.001	S4.58	0.0	OK	
15.002	S4.59	0.0	OK	
15.003	S4.60	0.0	OK	
15.004	S4.61	0.0	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 3 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe		Status
									Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	
2.000	S4.01	15 Summer	30	+0%	100/15 Summer				84.181	-0.026	0.000	1.00	96.6	OK

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

	US/MH	Level
PN	Name	Exceeded
2.000	S4.01	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
2.001	S4.02	15	Winter	30	+0%	100/15	Summer		83.964	-0.094	0.000	0.81	128.3
2.002	S4.03	15	Winter	30	+0%				82.588	-0.207	0.000	0.55	168.9
3.000	S4.04	15	Winter	30	+0%				82.179	-0.128	0.000	0.39	32.8
2.003	S4.05	15	Winter	30	+0%	100/15	Summer		81.796	-0.139	0.000	0.87	242.0
2.004	S4.06	480	Winter	30	+0%	100/15	Winter		81.610	-0.195	0.000	0.05	24.7
2.005	S4.07	480	Winter	30	+0%	2/360	Winter		81.610	0.235	0.000	0.15	24.6
2.006	S4.08	FC 480	Winter	30	+0%	2/240	Winter		81.609	0.244	0.000	0.00	1.8
4.000	S4.09	15	Winter	30	+0%	100/15	Summer		88.812	-0.113	0.000	0.49	18.6
4.001	S4.10	15	Winter	30	+0%	100/15	Summer		88.693	-0.053	0.000	0.65	42.3
4.002	S4.11	15	Winter	30	+0%	30/15	Winter		88.624	0.006	0.000	1.06	67.0
4.003	S4.12	15	Winter	30	+0%	100/15	Summer		88.431	-0.099	0.000	0.77	95.4
5.000	S4.13	15	Winter	30	+0%	100/15	Summer		94.960	-0.065	0.000	0.85	59.2
6.000	S4.14	15	Winter	30	+0%				95.525	-0.159	0.000	0.19	18.7
5.001	S4.15	15	Winter	30	+0%				94.468	-0.312	0.000	0.33	104.1
7.000	S4.16	15	Winter	30	+0%				94.437	-0.202	0.000	0.44	65.6
5.002	S4.17	15	Winter	30	+0%				94.168	-0.323	0.000	0.31	203.2
8.000	S4.18	15	Summer	30	+0%	30/15	Summer		93.051	0.010	0.000	1.15	65.7
5.003	S4.19	15	Winter	30	+0%				92.688	-0.307	0.000	0.35	290.1
9.000	S4.20	15	Winter	30	+0%	30/15	Summer		91.327	0.102	0.000	0.08	2.4
5.004	S4.21	15	Winter	30	+0%	30/15	Summer		91.327	0.143	0.000	2.75	335.7
5.005	S4.22	15	Winter	30	+0%	100/15	Winter		90.899	-0.256	0.000	0.51	392.5
5.006	S4.23	15	Winter	30	+0%	100/15	Summer		89.645	-0.282	0.000	0.54	433.8
5.007	S4.24	15	Winter	30	+0%	100/15	Summer		88.951	-0.332	0.000	0.41	462.5
10.000	S4.25	15	Winter	30	+0%	30/15	Summer	100/15 Summer	88.452	0.376	0.000	1.25	43.1

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
2.001	S4.02	OK	
2.002	S4.03	OK	
3.000	S4.04	OK	
2.003	S4.05	OK	
2.004	S4.06	OK	
2.005	S4.07	SURCHARGED	
2.006	S4.08 FC	SURCHARGED	
4.000	S4.09	OK	
4.001	S4.10	OK	
4.002	S4.11	SURCHARGED	
4.003	S4.12	OK	
5.000	S4.13	OK	
6.000	S4.14	OK	
5.001	S4.15	OK	
7.000	S4.16	OK	
5.002	S4.17	OK	
8.000	S4.18	SURCHARGED	
5.003	S4.19	OK	
9.000	S4.20	SURCHARGED	
5.004	S4.21	SURCHARGED	
5.005	S4.22	OK	
5.006	S4.23	OK	
5.007	S4.24	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
10.000	S4.25	SURCHARGED	2

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
5.008	S4.26	15 Winter	30	+0%	30/15 Summer				88.382	0.185	0.000	1.41	552.6
4.004	S4.27	15 Winter	30	+0%	30/15 Summer				88.074	0.029	0.000	1.05	665.5
4.005	S4.28	15 Winter	30	+0%	100/15 Summer				87.376	-0.272	0.000	0.57	690.9
4.006	S4.29	15 Winter	30	+0%	30/15 Summer	100/15 Summer			86.626	0.641	0.000	0.92	657.8
4.007	S4.30	15 Winter	30	+0%	30/15 Summer				86.405	0.695	0.000	1.08	665.0
4.008	S4.31	15 Winter	30	+0%	30/15 Summer				86.224	0.675	0.000	0.72	665.1
4.009	S4.32	15 Winter	30	+0%	2/15 Summer				86.023	0.873	0.000	3.32	786.7
4.010	S4.33	15 Winter	30	+0%	2/15 Summer	100/15 Summer			85.879	0.749	0.000	1.54	785.3
4.011	S4.34	15 Winter	30	+0%	2/15 Summer	100/30 Winter			85.728	0.648	0.000	1.13	782.4
4.012	S4.35	15 Winter	30	+0%	2/15 Summer				85.575	0.575	0.000	3.71	778.3
4.013	S4.36 FC 960	15 Winter	30	+0%	2/15 Summer				85.517	0.902	0.000	0.14	10.7
11.000	S4.37	15 Winter	30	+0%	100/15 Summer				87.048	-0.120	0.000	0.51	126.4
12.000	S4.38	15 Winter	30	+0%					91.107	-0.162	0.000	0.18	15.5
12.001	S4.39	15 Winter	30	+0%					90.177	-0.141	0.000	0.29	40.1
13.000	S4.40	15 Winter	30	+0%	30/15 Summer				90.269	0.070	0.000	0.34	22.0
13.001	S4.41	15 Winter	30	+0%	30/15 Summer				90.249	0.198	0.000	0.64	39.1
13.002	S4.42	15 Winter	30	+0%	30/15 Summer				90.173	0.198	0.000	0.97	60.0
13.003	S4.43	15 Winter	30	+0%	30/15 Summer				90.086	0.197	0.000	1.16	79.1
13.004	S4.44	15 Winter	30	+0%	100/15 Summer				89.389	-0.126	0.000	0.77	78.2
13.005	S4.45	15 Winter	30	+0%	100/15 Summer				89.283	-0.128	0.000	0.76	77.4
13.006	S4.46	15 Winter	30	+0%					89.051	-0.257	0.000	0.22	77.5
12.002	S4.47	15 Winter	30	+0%					88.408	-0.184	0.000	0.49	114.9
14.000	S4.48	15 Winter	30	+0%	100/15 Summer				87.847	-0.123	0.000	0.42	15.4
12.003	S4.49	15 Winter	30	+0%	100/15 Summer				87.513	-0.147	0.000	0.77	148.5

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
5.008	S4.26	SURCHARGED	
4.004	S4.27	SURCHARGED	
4.005	S4.28	OK	
4.006	S4.29	SURCHARGED	4
4.007	S4.30	SURCHARGED	
4.008	S4.31	SURCHARGED	
4.009	S4.32	SURCHARGED	
4.010	S4.33	SURCHARGED	6
4.011	S4.34	SURCHARGED	2
4.012	S4.35	SURCHARGED	
4.013	S4.36 FC	SURCHARGED	
11.000	S4.37	OK	
12.000	S4.38	OK	
12.001	S4.39	OK	
13.000	S4.40	SURCHARGED	
13.001	S4.41	SURCHARGED	
13.002	S4.42	SURCHARGED	
13.003	S4.43	SURCHARGED	
13.004	S4.44	OK	
13.005	S4.45	OK	
13.006	S4.46	OK	
12.002	S4.47	OK	
14.000	S4.48	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04


PN	US/MH Name	Status	Level Exceeded
12.003	S4.49	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m ³)		
12.004	S4.50	15 Winter	30	+0%	100/15 Summer				87.182	-0.310	0.000	0.35	167.5
11.001	S4.51	15 Winter	30	+0%	30/15 Summer				87.024	0.082	0.000	0.98	288.1
11.002	S4.52	15 Winter	30	+0%	30/15 Summer				86.760	0.085	0.000	1.64	305.5
11.003	S4.53	15 Winter	30	+0%	100/15 Summer				86.524	-0.101	0.000	0.84	303.6
11.004	S4.54	15 Winter	30	+0%	100/15 Summer	100/15 Winter			86.146	-0.217	0.000	0.48	303.5
11.005	S4.55	15 Winter	30	+0%	2/60 Summer				86.045	0.120	0.000	1.85	301.6
11.006	S4.56	FC 60 Winter	30	+0%	2/15 Summer		2/60 Winter	49	86.017	0.402	0.000	0.02	149.9
15.000	S4.57	60 Winter	30	+0%					90.590	-0.225	0.000	0.00	0.0
15.001	S4.58	60 Winter	30	+0%					89.959	-0.225	0.000	0.00	0.0
15.002	S4.59	60 Winter	30	+0%					89.485	-0.225	0.000	0.00	0.0
15.003	S4.60	60 Winter	30	+0%					89.356	-0.225	0.000	0.00	0.0
15.004	S4.61	60 Winter	30	+0%					88.972	-0.226	0.000	0.00	0.0

PN	US/MH Name	Status	Level Exceeded
12.004	S4.50	OK	
11.001	S4.51	SURCHARGED	
11.002	S4.52	SURCHARGED	
11.003	S4.53	OK	
11.004	S4.54	FLOOD RISK	5
11.005	S4.55	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
11.006	S4.56 FC	SURCHARGED	
15.000	S4.57	OK	
15.001	S4.58	OK	
15.002	S4.59	OK	
15.003	S4.60	OK	
15.004	S4.61	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 3 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe Flow	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
2.000	S4.01	15 Winter	100	+30%	100/15 Summer				84.951	0.744	0.000	1.49	144.0

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

	US/MH		Level
PN	Name	Status	Exceeded
2.000	S4.01	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap.
2.001	S4.02	15 Winter	100	+30%	100/15 Summer				84.613	0.555	0.000	1.20	190.6
2.002	S4.03	15 Winter	100	+30%					82.667	-0.128	0.000	0.83	255.8
3.000	S4.04	15 Winter	100	+30%					82.215	-0.092	0.000	0.65	55.4
2.003	S4.05	15 Winter	100	+30%	100/15 Summer				82.043	0.108	0.000	1.33	368.7
2.004	S4.06	120 Winter	100	+30%	100/15 Winter				81.893	0.088	0.000	0.25	123.1
2.005	S4.07	480 Winter	100	+30%	2/360 Winter				81.835	0.460	0.000	0.25	40.0
2.006	S4.08	FC 480 Winter	100	+30%	2/240 Winter				81.834	0.469	0.000	0.00	5.3
4.000	S4.09	15 Winter	100	+30%	100/15 Summer				89.899	0.974	0.000	1.16	43.6
4.001	S4.10	15 Winter	100	+30%	100/15 Summer				89.769	1.023	0.000	0.99	64.7
4.002	S4.11	15 Winter	100	+30%	30/15 Winter				89.664	1.046	0.000	1.34	85.1
4.003	S4.12	15 Winter	100	+30%	100/15 Summer				89.496	0.966	0.000	0.96	119.0
5.000	S4.13	15 Winter	100	+30%	100/15 Summer				95.273	0.248	0.000	1.42	98.7
6.000	S4.14	15 Winter	100	+30%					95.546	-0.138	0.000	0.32	31.6
5.001	S4.15	15 Winter	100	+30%					94.544	-0.236	0.000	0.57	176.3
7.000	S4.16	15 Winter	100	+30%					94.504	-0.135	0.000	0.74	110.9
5.002	S4.17	15 Winter	100	+30%					94.238	-0.253	0.000	0.52	341.9
8.000	S4.18	15 Summer	100	+30%	30/15 Summer				93.179	0.138	0.000	1.95	111.1
5.003	S4.19	15 Winter	100	+30%					92.765	-0.230	0.000	0.59	487.9
9.000	S4.20	15 Winter	100	+30%	30/15 Summer				91.672	0.447	0.000	0.14	4.3
5.004	S4.21	15 Winter	100	+30%	30/15 Summer				91.674	0.490	0.000	4.59	560.2
5.005	S4.22	15 Winter	100	+30%	100/15 Winter				91.222	0.067	0.000	0.81	624.2
5.006	S4.23	15 Winter	100	+30%	100/15 Summer				90.483	0.556	0.000	0.80	639.8
5.007	S4.24	15 Winter	100	+30%	100/15 Summer				90.083	0.799	0.000	0.59	669.2
10.000	S4.25	15 Winter	100	+30%	30/15 Summer	100/15 Summer			89.581	1.505	8.873	3.91	134.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
2.001	S4.02	SURCHARGED	
2.002	S4.03	OK	
3.000	S4.04	OK	
2.003	S4.05	SURCHARGED	
2.004	S4.06	SURCHARGED	
2.005	S4.07	SURCHARGED	
2.006	S4.08 FC	SURCHARGED	
4.000	S4.09	FLOOD RISK	
4.001	S4.10	SURCHARGED	
4.002	S4.11	SURCHARGED	
4.003	S4.12	SURCHARGED	
5.000	S4.13	SURCHARGED	
6.000	S4.14	OK	
5.001	S4.15	OK	
7.000	S4.16	OK	
5.002	S4.17	OK	
8.000	S4.18	SURCHARGED	
5.003	S4.19	OK	
9.000	S4.20	SURCHARGED	
5.004	S4.21	SURCHARGED	
5.005	S4.22	SURCHARGED	
5.006	S4.23	SURCHARGED	
5.007	S4.24	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
10.000	S4.25	FLOOD	2

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Overflow Cap.	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m³)		
5.008	S4.26	15 Winter	100	+30%	30/15 Summer				89.650	1.453	0.000	1.91	747.6
4.004	S4.27	15 Winter	100	+30%	30/15 Summer				89.085	1.040	0.000	1.42	897.0
4.005	S4.28	15 Winter	100	+30%	100/15 Summer				88.269	0.621	0.000	0.77	931.2
4.006	S4.29	15 Winter	100	+30%	30/15 Summer	100/15 Summer			87.361	1.376	45.656	1.11	798.4
4.007	S4.30	15 Summer	100	+30%	30/15 Summer				87.059	1.349	0.000	1.30	798.9
4.008	S4.31	15 Winter	100	+30%	30/15 Summer				86.818	1.269	0.000	0.87	807.0
4.009	S4.32	15 Winter	100	+30%	2/15 Summer				86.530	1.380	0.000	4.66	1102.8
4.010	S4.33	30 Winter	100	+30%	2/15 Summer	100/15 Summer			86.263	1.133	63.457	1.83	931.4
4.011	S4.34	60 Winter	100	+30%	2/15 Summer	100/30 Winter			86.201	1.121	1.144	1.24	859.6
4.012	S4.35	60 Winter	100	+30%	2/15 Summer				86.032	1.032	0.000	4.09	858.2
4.013	S4.36	FC 960 Winter	100	+30%	2/15 Summer				85.898	1.283	0.000	0.27	20.2
11.000	S4.37	15 Winter	100	+30%	100/15 Summer				87.580	0.412	0.000	0.78	194.6
12.000	S4.38	15 Winter	100	+30%					91.127	-0.142	0.000	0.30	26.2
12.001	S4.39	15 Winter	100	+30%					90.206	-0.112	0.000	0.49	67.9
13.000	S4.40	15 Winter	100	+30%	30/15 Summer				91.349	1.150	0.000	0.65	42.2
13.001	S4.41	15 Winter	100	+30%	30/15 Summer				91.318	1.266	0.000	1.08	66.4
13.002	S4.42	15 Winter	100	+30%	30/15 Summer				91.245	1.271	0.000	1.57	97.0
13.003	S4.43	15 Winter	100	+30%	30/15 Summer				91.026	1.137	0.000	1.87	127.8
13.004	S4.44	15 Winter	100	+30%	100/15 Summer				89.576	0.061	0.000	1.18	119.9
13.005	S4.45	15 Winter	100	+30%	100/15 Summer				89.432	0.020	0.000	1.17	119.0
13.006	S4.46	15 Winter	100	+30%					89.082	-0.227	0.000	0.33	119.1
12.002	S4.47	15 Winter	100	+30%					88.531	-0.061	0.000	0.76	176.6
14.000	S4.48	15 Winter	100	+30%	100/15 Summer				88.140	0.170	0.000	0.79	29.1
12.003	S4.49	15 Winter	100	+30%	100/15 Summer				88.005	0.345	0.000	1.19	228.8

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
5.008	S4.26	FLOOD RISK	
4.004	S4.27	FLOOD RISK	
4.005	S4.28	SURCHARGED	
4.006	S4.29	FLOOD	4
4.007	S4.30	FLOOD RISK	
4.008	S4.31	FLOOD RISK	
4.009	S4.32	FLOOD RISK	
4.010	S4.33	FLOOD	6
4.011	S4.34	FLOOD	2
4.012	S4.35	FLOOD RISK	
4.013	S4.36 FC	SURCHARGED	
11.000	S4.37	SURCHARGED	
12.000	S4.38	OK	
12.001	S4.39	OK	
13.000	S4.40	FLOOD RISK	
13.001	S4.41	SURCHARGED	
13.002	S4.42	SURCHARGED	
13.003	S4.43	SURCHARGED	
13.004	S4.44	SURCHARGED	
13.005	S4.45	SURCHARGED	
13.006	S4.46	OK	
12.002	S4.47	OK	
14.000	S4.48	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04


PN	US/MH Name	Status	Level Exceeded
12.003	S4.49	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe		
									Level (m)	Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)	Flow (l/s)
12.004	S4.50	15 Winter	100	+30%	100/15 Summer				87.769	0.277	0.000	0.54		263.2
11.001	S4.51	15 Winter	100	+30%	30/15 Summer				87.553	0.611	0.000	1.38		405.4
11.002	S4.52	15 Winter	100	+30%	30/15 Summer				87.048	0.373	0.000	2.32		430.8
11.003	S4.53	15 Winter	100	+30%	100/15 Summer				86.747	0.122	0.000	1.19		428.3
11.004	S4.54	30 Winter	100	+30%	100/15 Summer	100/15 Winter			86.423	0.060	22.964	0.60		378.6
11.005	S4.55	30 Winter	100	+30%	2/60 Summer				86.269	0.344	0.000	2.26		368.8
11.006	S4.56	FC 60 Winter	100	+30%	2/15 Summer		2/60 Winter	49	86.162	0.547	0.000	0.02	353.0	3.4
15.000	S4.57	60 Winter	100	+30%					90.590	-0.225	0.000	0.00		0.0
15.001	S4.58	60 Winter	100	+30%					89.959	-0.225	0.000	0.00		0.0
15.002	S4.59	60 Winter	100	+30%					89.485	-0.225	0.000	0.00		0.0
15.003	S4.60	60 Winter	100	+30%					89.356	-0.225	0.000	0.00		0.0
15.004	S4.61	60 Winter	100	+30%					88.972	-0.226	0.000	0.00		0.0

PN	US/MH Name	Status	Level Exceeded
12.004	S4.50	SURCHARGED	
11.001	S4.51	FLOOD RISK	
11.002	S4.52	FLOOD RISK	
11.003	S4.53	FLOOD RISK	
11.004	S4.54	FLOOD	5
11.005	S4.55	FLOOD RISK	

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Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 4 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 04

PN	US/MH Name	Status	Level Exceeded
11.006	S4.56 FC	FLOOD RISK	
15.000	S4.57	OK	
15.001	S4.58	OK	
15.002	S4.59	OK	
15.003	S4.60	OK	
15.004	S4.61	OK	