STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW 05

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

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

Designed with Level Soffits

Network Design Table for SW 05

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	1.928	0.236	8.2	0.000	7.00	0.0	0.600		o	225	Pipe/Conduit	
2.000	1.956	0.236	8.3	0.000	7.00	0.0	0.600		o	225	Pipe/Conduit	
1.001	8.946	0.761	11.8	0.131	0.00	0.0	0.600		o	225	Pipe/Conduit	
3.000	117.369	0.001	117369.5	0.000	6.00	0.0	0.600			-1	Pipe/Conduit	
1.002	44.172	0.002	22085.9	0.000	0.00	0.0	0.600			-1	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	7.01	91.470	0.000	0.0	0.0	0.0	4.61	183.2	0.0
2.000	50.00	7.01	91.470	0.000	0.0	0.0	0.0	4.57	181.9	0.0
1.001	50.00	7.05	91.234	0.131	0.0	0.0	0.0	3.84	152.6	17.7
3.000	32.43	15.61	90.474	0.000	0.0	0.0	0.0	0.20	1400.1	0.0
1.002	30.65	17.14	90.473	0.131	0.0	0.0	0.0	0.48	3311.2	17.7

Network Design Table for SW 05

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
4.000	11.206	0.317	35.4	0.423	6.00	0.0	0.600		o	300	Pipe/Conduit	
4.001	55.908	0.149	375.2	0.069	0.00	0.0	0.600		o	450	Pipe/Conduit	
4.002	24.927	0.066	377.7	0.016	0.00	0.0	0.600		o	450	Pipe/Conduit	
4.003	78.828	0.210	375.4	0.214	0.00	0.0	0.600		o	450	Pipe/Conduit	
5.000	9.839	0.556	17.7	0.648	7.00	0.0	0.600		o	450	Pipe/Conduit	
4.004	23.177	0.160	144.9	0.366	0.00	0.0	0.600		o	600	Pipe/Conduit	
4.005	28.705	0.198	145.0	0.010	0.00	0.0	0.600		o	600	Pipe/Conduit	
6.000	11.381#	0.567	20.1	0.136	7.00	0.0	0.600		o	225	Pipe/Conduit	
4.006	10.679#	0.109	98.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
4.007	3.989	0.191	20.9	0.167	0.00	0.0	0.600		o	600	Pipe/Conduit	
7.000	2.742	0.325	8.4	0.000	7.00	0.0	0.600		o	225	Pipe/Conduit	
4.008	6.488	0.228	28.5	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
8.000	42.223	0.286	147.6	0.000	7.00	0.0	0.600			-1	Pipe/Conduit	
8.001	23.241	0.061	381.0	0.000	0.00	0.0	0.600		o	900	Pipe/Conduit	
8.002	9.592	0.675	14.2	0.000	0.00	0.0	0.600			-1	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)
4.000	50.00	6.07	92.400	0.423	0.0	0.0	0.0	2.65	187.5	57.3
4.001	50.00	6.96	91.933	0.492	0.0	0.0	0.0	1.04	166.0	66.6
4.002	48.96	7.36	91.784	0.508	0.0	0.0	0.0	1.04	165.4	67.4
4.003	45.20	8.62	91.718	0.722	0.0	0.0	0.0	1.04	165.9	88.4
5.000	50.00	7.03	92.064	0.648	0.0	0.0	0.0	4.85	771.5	87.7
4.004	44.69	8.81	91.358	1.736	0.0	0.0	0.0	2.02	571.5	210.1
4.005	44.08	9.05	91.198	1.746	0.0	0.0	0.0	2.02	571.3	210.1
6.000	50.00	7.06	91.792	0.136	0.0	0.0	0.0	2.93	116.7	18.4
4.006	43.89	9.12	91.000	1.882	0.0	0.0	0.0	2.46	695.7	223.7
4.007	43.86	9.13	90.891	2.049	0.0	0.0	0.0	5.34	1511.1	243.4
7.000	50.00	7.01	91.400	0.000	0.0	0.0	0.0	4.53	180.2	0.0
4.008	43.80	9.16	90.700	2.049	0.0	0.0	0.0	4.58	1294.0	243.4
8.000	49.82	7.12	91.494	0.000	0.0	0.0	0.0	6.02	41408.6	0.0
8.001	48.97	7.36	91.208	0.000	0.0	0.0	0.0	1.60	1017.4	0.0
8.002	48.94	7.37	91.147	0.000	0.0	0.0	0.0	19.43	133668.4	0.0

Network Design Table for SW 05

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
4.009	67.013	0.001	67012.9	0.000	0.00	0.0	0.600			-1	Pipe/Conduit	
1.003	5.492	0.051	107.7	0.000	0.00	0.0	0.600			-1	Pipe/Conduit	
1.004	54.567	2.020	27.0	0.000	0.00	0.0		0.045	3 \=/	525	1:3 Swale	
1.005	7.536	0.469	16.1	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.006	26.586	0.120	221.6	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.007	58.663	1.722	34.1	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.008	42.319	0.909	46.6	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.009	27.144	0.090	301.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.009	35.71	13.26	90.472	2.049	0.0	0.0	0.0	0.27	1872.2	243.4
1.003	30.63	17.16	90.471	2.180	0.0	0.0	0.0	7.05	48499.2	243.4
1.004	29.59	18.15	90.420	2.180	0.0	0.0	0.0	0.92	134.0«	243.4
1.005	29.57	18.17	88.400	2.180	0.0	0.0	0.0	5.61	1213.9	243.4
1.006	29.28	18.47	87.931	2.180	0.0	0.0	0.0	1.50	324.9	243.4
1.007	29.03	18.72	87.811	2.180	0.0	0.0	0.0	3.85	832.8	243.4
1.008	28.82	18.93	86.089	2.180	0.0	0.0	0.0	3.29	712.0	243.4
1.009	28.42	19.37	85.180	2.180	0.0	0.0	0.0	1.04	114.6«	243.4

Manhole Schedules for SW 05

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)
S5.01	92.877	1.407	Junction		1.000	91.470	225				
S5.02	92.813	1.343	Junction		2.000	91.470	225				
S5.03	92.799	1.565	Open Manhole	1500	1.001	91.234	225	1.000	91.234	225	
								2.000	91.234	225	
S5.04	92.150	1.676	Junction		3.000	90.474	-1				
S5.05	92.427	1.954	Junction		1.002	90.473	-1	1.001	90.473	225	
								3.000	90.473	-1	
S5.06	93.954	1.554	Open Manhole	1200	4.000	92.400	300				
S5.07	93.584	1.651	Open Manhole	1500	4.001	91.933	450	4.000	92.083	300	
S5.08A	96.164	4.380	Open Manhole	1500	4.002	91.784	450	4.001	91.784	450	
S5.08	96.547	4.829	Open Manhole	1500	4.003	91.718	450	4.002	91.718	450	
S5.09	94.928	2.864	Open Manhole	1500	5.000	92.064	450				
S5.10	95.016	3.658	Open Manhole	1500	4.004	91.358	600	4.003	91.508	450	
								5.000	91.508	450	
S5.11	94.421	3.223	Open Manhole	1500	4.005	91.198	600	4.004	91.198	600	
S5.12	93.346	1.554	Open Manhole	1200	6.000	91.792	225				
S5.13	93.645	2.645	Open Manhole	1500	4.006	91.000	600	4.005	91.000	600	
								6.000	91.225	225	
S5.14	92.851	1.960	Junction		4.007	90.891	600	4.006	90.891	600	
S5.15	92.709	1.309	Junction		7.000	91.400	225				
S5.16	92.759	2.059	Open Manhole	1500	4.008	90.700	600	4.007	90.700	600	
								7.000	91.075	225	
S5.17	93.100	1.606	Junction		8.000	91.494	-1				
S5.18	92.700	1.492	Junction		8.001	91.208	900	8.000	91.208	-1	
S5.19	92.346	1.199	Junction		8.002	91.147	-1	8.001	91.147	900	
S5.20	92.080	1.608	Junction		4.009	90.472	-1	4.008	90.472	600	
								8.002	90.472	-1	
S5.21	92.000	1.529	Junction		1.003	90.471	-1	1.002	90.471	-1	
								4.009	90.471	-1	
S5.22 FC	92.000	1.580	Junction		1.004	90.420	525	1.003	90.420	-1	
S5.23	89.770	1.370	Junction		1.005	88.400	525	1.004	88.400	525	
S5.24	89.617	1.686	Open Manhole	1500	1.006	87.931	525	1.005	87.931	525	
S5.25	89.745	1.934	Open Manhole	1500	1.007	87.811	525	1.006	87.811	525	
S5.26	87.823	1.734	Open Manhole	1500	1.008	86.089	525	1.007	86.089	525	
S5.27	87.141	1.961	Open Manhole	1500	1.009	85.180	375	1.008	85.180	525	
S5.O1	91.000	5.910	Open Manhole	1800		OUTFALL		1.009	85.090	375	

Manhole Schedules for SW 05

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S5.01	568274.483	245885.733			No Entry	
S5.02	568277.271	245886.423			No Entry	
S5.03	568275.545	245887.342	568275.545	245887.342	Required	
S5.04	568378.187	245829.705			No Entry	
S5.05	568280.511	245894.782			No Entry	
S5.06	568076.505	245780.710	568076.505	245780.710	Required	
S5.07	568066.715	245786.163	568066.715	245786.163	Required	
S5.08A	568082.766	245839.717	568082.766	245839.717	Required	
S5.08	568091.478	245863.072	568091.478	245863.072	Required	
S5.09	568159.707	245906.996	568159.707	245906.996	Required	
S5.10	568152.192	245913.347	568152.192	245913.347	Required	
S5.11	568162.300	245934.204	568162.300	245934.204	Required	
S5.12	568166.640	245968.357	568166.640	245968.357	Required	
S5.13	568174.817	245960.036	568174.817	245960.036	Required	
S5.14	568184.624	245956.652			No Entry	

Manhole Schedules for SW 05

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S5.15	568190.604	245953.840			No Entry	
S5.16	568188.456	245955.544	568188.456	245955.544	Required	
S5.17	568131.013	246005.731			No Entry	
S5.18	568165.480	245981.342			No Entry	
S5.19	568184.091	245967.422			No Entry	
S5.20	568191.468	245961.291			No Entry	
S5.21	568246.068	245922.438			No Entry	
S5.22 FC	568249.463	245926.756			No Entry	
S5.23	568279.155	245972.537			No Entry	
S5.24	568283.317	245978.820	568283.317	245978.820	Required	
S5.25	568263.757	245996.827	568263.757	245996.827	Required	
S5.26	568295.049	246046.448	568295.049	246046.448	Required	
S5.27	568331.621	246025.157	568331.621	246025.157	Required	
S5.O1	568350.466	246044.693			No Entry	

PIPELINE SCHEDULES for SW 05

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	225	S5.01	92.877	91.470	1.182	Junction	
2.000	o	225	S5.02	92.813	91.470	1.118	Junction	
1.001	o	225	S5.03	92.799	91.234	1.340	Open Manhole	1500
3.000		-1	S5.04	92.150	90.474	0.076	Junction	
1.002		-1	S5.05	92.427	90.473	0.354	Junction	
4.000	o	300	S5.06	93.954	92.400	1.254	Open Manhole	1200
4.001	o	450	S5.07	93.584	91.933	1.201	Open Manhole	1500
4.002	o	450	S5.08A	96.164	91.784	3.930	Open Manhole	1500
4.003	o	450	S5.08	96.547	91.718	4.379	Open Manhole	1500
5.000	o	450	S5.09	94.928	92.064	2.414	Open Manhole	1500
4.004	o	600	S5.10	95.016	91.358	3.058	Open Manhole	1500
4.005	o	600	S5.11	94.421	91.198	2.623	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	1.928	8.2	S5.03	92.799	91.234	1.340	Open Manhole	1500
2.000	1.956	8.3	S5.03	92.799	91.234	1.340	Open Manhole	1500
1.001	8.946	11.8	S5.05	92.427	90.473	1.729	Junction	
3.000	117.369	117369.5	S5.05	92.427	90.473	0.354	Junction	
1.002	44.172	22085.9	S5.21	92.000	90.471	-0.071	Junction	
4.000	11.206	35.4	S5.07	93.584	92.083	1.201	Open Manhole	1500
4.001	55.908	375.2	S5.08A	96.164	91.784	3.930	Open Manhole	1500
4.002	24.927	377.7	S5.08	96.547	91.718	4.379	Open Manhole	1500
4.003	78.828	375.4	S5.10	95.016	91.508	3.058	Open Manhole	1500
5.000	9.839	17.7	S5.10	95.016	91.508	3.058	Open Manhole	1500
4.004	23.177	144.9	S5.11	94.421	91.198	2.623	Open Manhole	1500
4.005	28.705	145.0	S5.13	93.645	91.000	2.045	Open Manhole	1500

PIPELINE SCHEDULES for SW 05

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	225	S5.12	93.346	91.792	1.329	Open Manhole	1200
4.006	o	600	S5.13	93.645	91.000	2.045	Open Manhole	1500
4.007	o	600	S5.14	92.851	90.891	1.360	Junction	
7.000	o	225	S5.15	92.709	91.400	1.084	Junction	
4.008	o	600	S5.16	92.759	90.700	1.459	Open Manhole	1500
8.000		-1	S5.17	93.100	91.494	0.006	Junction	
8.001	o	900	S5.18	92.700	91.208	0.592	Junction	
8.002		-1	S5.19	92.346	91.147	-0.401	Junction	
4.009		-1	S5.20	92.080	90.472	0.008	Junction	
1.003		-1	S5.21	92.000	90.471	-0.071	Junction	
1.004	3 \=/	525	S5.22 FC	92.000	90.420	1.430	Junction	
1.005	o	525	S5.23	89.770	88.400	0.845	Junction	
1.006	o	525	S5.24	89.617	87.931	1.161	Open Manhole	1500
1.007	o	525	S5.25	89.745	87.811	1.409	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	11.381#	20.1	S5.13	93.645	91.225	2.195	Open Manhole	1500
4.006	10.679#	98.0	S5.14	92.851	90.891	1.360	Junction	
4.007	3.989	20.9	S5.16	92.759	90.700	1.459	Open Manhole	1500
7.000	2.742	8.4	S5.16	92.759	91.075	1.459	Open Manhole	1500
4.008	6.488	28.5	S5.20	92.080	90.472	1.008	Junction	
8.000	42.223	147.6	S5.18	92.700	91.208	-0.108	Junction	
8.001	23.241	381.0	S5.19	92.346	91.147	0.299	Junction	
8.002	9.592	14.2	S5.20	92.080	90.472	0.008	Junction	
4.009	67.013	67012.9	S5.21	92.000	90.471	-0.071	Junction	
1.003	5.492	107.7	S5.22 FC	92.000	90.420	-0.020	Junction	
1.004	54.567	27.0	S5.23	89.770	88.400	1.220	Junction	
1.005	7.536	16.1	S5.24	89.617	87.931	1.161	Open Manhole	1500
1.006	26.586	221.6	S5.25	89.745	87.811	1.409	Open Manhole	1500
1.007	58.663	34.1	S5.26	87.823	86.089	1.209	Open Manhole	1500

PIPELINE SCHEDULES for SW 05

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)
1.008	o	525	S5.26	87.823	86.089	1.209	Open Manhole	1500
1.009	o	375	S5.27	87.141	85.180	1.586	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)
1.008	42.319	46.6	S5.27	87.141	85.180	1.436	Open Manhole	1500
1.009	27.144	301.6	S5.O1	91.000	85.090	5.535	Open Manhole	1800

Area Summary for SW 05

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.131	0.131	0.131
3.000	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.423	0.423	0.423
4.001	-	-	100	0.069	0.069	0.069
4.002	-	-	100	0.016	0.016	0.016
4.003	-	-	100	0.214	0.214	0.214
5.000	-	-	100	0.648	0.648	0.648
4.004	-	-	100	0.366	0.366	0.366
4.005	-	-	100	0.010	0.010	0.010
6.000	-	-	100	0.136	0.136	0.136
4.006	-	-	100	0.000	0.000	0.000
4.007	-	-	100	0.167	0.167	0.167
7.000	-	-	100	0.000	0.000	0.000
4.008	-	-	100	0.000	0.000	0.000
8.000	-	-	100	0.000	0.000	0.000
8.001	-	-	100	0.000	0.000	0.000
8.002	-	-	100	0.000	0.000	0.000
4.009	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.180	2.180	2.180

Simulation Criteria for SW 05

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	1.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	10080
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	2

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	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)	21.000
Return Period (years)	100	Ratio R	0.430
Region	England and Wales	Profile Type	Winter

Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 15
Cv (Winter) 0.840

Online Controls for SW 05

Complex Manhole: S5.22 FC, DS/PN: 1.004, Volume (m³): 37.8

Orifice

Diameter (m) 0.060 Discharge Coefficient 0.600 Invert Level (m) 90.420

Orifice

Diameter (m) 0.060 Discharge Coefficient 0.600 Invert Level (m) 91.120

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	1.000
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	1	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	0.430
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	21.000	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S5.01	60 Winter	1	+0%				
2.000	S5.02	60 Winter	1	+0%				
1.001	S5.03	15 Winter	1	+0%	30/240 Winter			
3.000	S5.04	360 Winter	1	+0%				
1.002	S5.05	360 Winter	1	+0%				
4.000	S5.06	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
4.001	S5.07	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
4.002	S5.08A	15 Winter	1	+0%	30/15 Summer			
4.003	S5.08	15 Winter	1	+0%	30/15 Summer			
5.000	S5.09	15 Winter	1	+0%	100/15 Summer			
4.004	S5.10	15 Winter	1	+0%	30/15 Summer			
4.005	S5.11	15 Winter	1	+0%	30/15 Summer			
6.000	S5.12	15 Winter	1	+0%	100/15 Summer			
4.006	S5.13	15 Winter	1	+0%	30/15 Summer			
4.007	S5.14	15 Winter	1	+0%				
7.000	S5.15	60 Winter	1	+0%				
4.008	S5.16	360 Winter	1	+0%	30/15 Winter			
8.000	S5.17	60 Winter	1	+0%				
8.001	S5.18	60 Winter	1	+0%				

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S5.01	91.470	-0.225	0.000	0.00		0.0	OK*	
2.000	S5.02	91.470	-0.225	0.000	0.00		0.0	OK*	
1.001	S5.03	91.289	-0.170	0.000	0.14		16.7	OK	
3.000	S5.04	91.097	-0.977	0.000	0.00		0.0	OK	
1.002	S5.05	91.097	-0.976	0.000	0.00		3.0	OK	
4.000	S5.06	92.534	-0.166	0.000	0.42		58.7	OK	4
4.001	S5.07	92.143	-0.240	0.000	0.43		65.1	OK	5
4.002	S5.08A	92.021	-0.213	0.000	0.47		64.9	OK	
4.003	S5.08	91.960	-0.208	0.000	0.54		83.4	OK	
5.000	S5.09	92.200	-0.314	0.000	0.20		83.2	OK	
4.004	S5.10	91.657	-0.301	0.000	0.49		196.7	OK	
4.005	S5.11	91.478	-0.320	0.000	0.44		198.3	OK	
6.000	S5.12	91.855	-0.162	0.000	0.18		17.4	OK	
4.006	S5.13	91.341	-0.259	0.000	0.62		213.7	OK	
4.007	S5.14	91.201	-0.290	0.000	0.52		229.9	OK*	
7.000	S5.15	91.400	-0.225	0.000	0.00		0.0	OK*	
4.008	S5.16	91.098	-0.202	0.000	0.09		44.5	OK	
8.000	S5.17	91.494	-1.600	0.000	0.00		0.0	OK	
8.001	S5.18	91.208	-0.900	0.000	0.00		0.0	OK*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.002	S5.19	60 Winter	1	+0%					91.147
4.009	S5.20	360 Winter	1	+0%					91.097
1.003	S5.21	360 Winter	1	+0%					91.097
1.004	S5.22 FC	360 Winter	1	+0%					91.098
1.005	S5.23	360 Winter	1	+0%					88.429
1.006	S5.24	360 Winter	1	+0%					87.985
1.007	S5.25	360 Winter	1	+0%					87.831
1.008	S5.26	360 Winter	1	+0%					86.113
1.009	S5.27	360 Winter	1	+0%					85.239

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
8.002	S5.19	-1.600	0.000	0.00		0.0	OK	
4.009	S5.20	-0.975	0.000	0.00		43.2	OK	
1.003	S5.21	-0.974	0.000	0.00		9.2	OK	
1.004	S5.22 FC	-0.902	0.000	0.00		6.0	OK	
1.005	S5.23	-0.496	0.000	0.01		6.0	OK*	
1.006	S5.24	-0.471	0.000	0.02		6.0	OK	
1.007	S5.25	-0.505	0.000	0.01		6.0	OK	
1.008	S5.26	-0.501	0.000	0.01		6.0	OK	
1.009	S5.27	-0.316	0.000	0.06		6.0	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	1.000
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	1	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	0.430
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	21.000	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S5.01	360 Winter	30	+0%				
2.000	S5.02	360 Winter	30	+0%				
1.001	S5.03	360 Winter	30	+0%	30/240 Winter			
3.000	S5.04	360 Winter	30	+0%				
1.002	S5.05	360 Winter	30	+0%				
4.000	S5.06	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
4.001	S5.07	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
4.002	S5.08A	15 Winter	30	+0%	30/15 Summer			
4.003	S5.08	15 Winter	30	+0%	30/15 Summer			
5.000	S5.09	15 Winter	30	+0%	100/15 Summer			
4.004	S5.10	15 Winter	30	+0%	30/15 Summer			
4.005	S5.11	15 Winter	30	+0%	30/15 Summer			
6.000	S5.12	15 Winter	30	+0%	100/15 Summer			
4.006	S5.13	15 Winter	30	+0%	30/15 Summer			
4.007	S5.14	30 Winter	30	+0%				
7.000	S5.15	360 Winter	30	+0%				
4.008	S5.16	360 Winter	30	+0%	30/15 Winter			
8.000	S5.17	360 Winter	30	+0%				
8.001	S5.18	360 Winter	30	+0%				

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S5.01	91.504	-0.191	0.000	0.00		0.0	OK*	
2.000	S5.02	91.504	-0.191	0.000	0.00		0.0	OK*	
1.001	S5.03	91.504	0.045	0.000	0.05		6.3	SURCHARGED	
3.000	S5.04	91.503	-0.571	0.000	0.00		0.0	OK	
1.002	S5.05	91.503	-0.570	0.000	0.00		5.2	OK	
4.000	S5.06	93.020	0.320	0.000	0.95		133.6	SURCHARGED	4
4.001	S5.07	92.773	0.390	0.000	0.95		144.1	SURCHARGED	5
4.002	S5.08A	92.649	0.415	0.000	1.04		143.9	SURCHARGED	
4.003	S5.08	92.581	0.413	0.000	1.18		183.2	SURCHARGED	
5.000	S5.09	92.384	-0.130	0.000	0.49		204.2	OK	
4.004	S5.10	92.266	0.308	0.000	1.13		454.7	SURCHARGED	
4.005	S5.11	92.055	0.257	0.000	1.01		451.4	SURCHARGED	
6.000	S5.12	91.939	-0.078	0.000	0.43		42.9	OK	
4.006	S5.13	91.847	0.247	0.000	1.42		493.2	SURCHARGED	
4.007	S5.14	91.491	0.000	0.000	1.06		465.3	SURCHARGED*	
7.000	S5.15	91.617	-0.008	0.000	0.01		0.6	OK*	
4.008	S5.16	91.617	0.317	0.000	0.21		100.2	SURCHARGED	
8.000	S5.17	91.506	-1.588	0.000	0.00		0.0	OK	
8.001	S5.18	91.506	-0.602	0.000	0.00		1.4	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.002	S5.19	360 Winter	30	+0%					91.506
4.009	S5.20	360 Winter	30	+0%					91.506
1.003	S5.21	360 Winter	30	+0%					91.503
1.004	S5.22 FC	360 Winter	30	+0%					91.503
1.005	S5.23	360 Winter	30	+0%					88.454
1.006	S5.24	360 Winter	30	+0%					88.003
1.007	S5.25	360 Winter	30	+0%					87.851
1.008	S5.26	360 Winter	30	+0%					86.137
1.009	S5.27	360 Winter	30	+0%					85.266

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
8.002	S5.19	-1.241	0.000	0.00		1.7	OK	
4.009	S5.20	-0.566	0.000	0.01		93.1	OK	
1.003	S5.21	-0.568	0.000	0.00		14.0	OK	
1.004	S5.22 FC	-0.497	0.000	0.00		12.2	OK	
1.005	S5.23	-0.471	0.000	0.02		12.2	OK*	
1.006	S5.24	-0.453	0.000	0.05		12.2	OK	
1.007	S5.25	-0.485	0.000	0.02		12.2	OK	
1.008	S5.26	-0.477	0.000	0.02		12.2	OK	
1.009	S5.27	-0.289	0.000	0.12		12.2	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	1.000
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	1	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	0.430
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	21.000	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S5.01	120 Winter	100	+30%				
2.000	S5.02	120 Winter	100	+30%				
1.001	S5.03	360 Winter	100	+30%	30/240 Winter			
3.000	S5.04	360 Winter	100	+30%				
1.002	S5.05	360 Winter	100	+30%				
4.000	S5.06	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
4.001	S5.07	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
4.002	S5.08A	15 Winter	100	+30%	30/15 Summer			
4.003	S5.08	15 Winter	100	+30%	30/15 Summer			
5.000	S5.09	15 Winter	100	+30%	100/15 Summer			
4.004	S5.10	15 Winter	100	+30%	30/15 Summer			
4.005	S5.11	15 Winter	100	+30%	30/15 Summer			
6.000	S5.12	15 Winter	100	+30%	100/15 Summer			
4.006	S5.13	15 Winter	100	+30%	30/15 Summer			
4.007	S5.14	60 Winter	100	+30%				
7.000	S5.15	60 Winter	100	+30%				
4.008	S5.16	360 Winter	100	+30%	30/15 Winter			
8.000	S5.17	360 Winter	100	+30%				
8.001	S5.18	360 Winter	100	+30%				

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S5.01	91.695	0.000	0.000	0.00		0.0	SURCHARGED*	
2.000	S5.02	91.695	0.000	0.000	0.00		0.0	SURCHARGED*	
1.001	S5.03	91.891	0.432	0.000	0.08		10.2	SURCHARGED	
3.000	S5.04	91.891	-0.183	0.000	0.00		0.0	FLOOD RISK*	
1.002	S5.05	91.891	-0.182	0.000	0.00		6.4	OK	
4.000	S5.06	93.973	1.273	18.603	1.06		149.7	FLOOD	4
4.001	S5.07	93.639	1.256	54.570	1.59		242.7	FLOOD	5
4.002	S5.08A	93.881	1.647	0.000	1.74		241.9	SURCHARGED	
4.003	S5.08	93.929	1.761	0.000	1.56		242.9	SURCHARGED	
5.000	S5.09	94.273	1.759	0.000	0.85		356.1	SURCHARGED	
4.004	S5.10	93.907	1.949	0.000	1.71		686.8	SURCHARGED	
4.005	S5.11	93.453	1.655	0.000	1.52		678.6	SURCHARGED	
6.000	S5.12	93.239	1.222	0.000	0.78		77.3	FLOOD RISK	
4.006	S5.13	92.986	1.386	0.000	2.14		744.4	SURCHARGED	
4.007	S5.14	91.491	0.000	0.000	1.30		569.6	SURCHARGED*	
7.000	S5.15	91.625	0.000	0.000	0.01		0.5	SURCHARGED*	
4.008	S5.16	92.067	0.767	0.000	0.34		161.4	SURCHARGED	
8.000	S5.17	91.927	-1.167	0.000	0.00		0.0	OK	
8.001	S5.18	91.927	-0.181	0.000	0.00		3.5	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.002	S5.19	360 Winter	100	+30%					91.927
4.009	S5.20	360 Winter	100	+30%					91.927
1.003	S5.21	360 Winter	100	+30%					91.891
1.004	S5.22 FC	360 Winter	100	+30%					91.890
1.005	S5.23	360 Winter	100	+30%					88.459
1.006	S5.24	360 Winter	100	+30%					88.012
1.007	S5.25	360 Winter	100	+30%					87.862
1.008	S5.26	360 Winter	100	+30%					86.144
1.009	S5.27	360 Winter	100	+30%					85.278

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
8.002	S5.19	-0.820	0.000	0.00		4.0	OK	
4.009	S5.20	-0.145	0.000	0.01		139.0	FLOOD RISK*	
1.003	S5.21	-0.180	0.000	0.00		16.3	FLOOD RISK*	
1.004	S5.22 FC	-0.110	0.000	0.00		15.5	FLOOD RISK*	
1.005	S5.23	-0.466	0.000	0.03		15.5	OK*	
1.006	S5.24	-0.444	0.000	0.06		15.5	OK	
1.007	S5.25	-0.474	0.000	0.02		15.5	OK	
1.008	S5.26	-0.470	0.000	0.02		15.5	OK	
1.009	S5.27	-0.277	0.000	0.15		15.5	OK	