

AECOM		Page 1
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019	Designed by SK	
File 2L.S . SURFACE WATER MODEL.MDX	Checked by RP	
XP Solutions	Network 2018.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Existing

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1000	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.350	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 Existing

« - Indicates pipe capacity < flow

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
E1.000	8.434	0.056	150.6	0.010	1.00	0.0	0.600	o	225	Pipe/Conduit	
E1.001	39.291	0.262	150.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
E1.002	9.979	0.067	148.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
E1.003	8.009	0.053	151.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
E1.004	4.891	0.033	148.2	0.022	0.00	0.0	0.600	o	225	Pipe/Conduit	
E1.005	4.891	0.033	148.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
E1.006	14.681	0.098	149.8	0.184	0.00	0.0	0.600	o	400	Pipe/Conduit	
E1.007	14.681	0.098	149.8	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
E1.008	22.673	0.113	200.6	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
E1.009	20.289	0.203	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
E2.000	23.632	0.158	149.6	0.021	1.00	0.0	0.600	o	150	Pipe/Conduit	
E1.010	14.953	0.150	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
E1.011	6.588	0.066	100.0	0.000	0.00	0.0	0.600	o	150	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)
E1.000	50.00	1.13	0.707	0.010	0.0	0.0	0.0	1.06	42.3	1.4
E1.001	50.00	1.75	0.651	0.026	0.0	0.0	0.0	1.07	42.4	3.5
E1.002	50.00	1.90	0.389	0.026	0.0	0.0	0.0	1.07	42.5	3.5
E1.003	50.00	2.03	0.322	0.026	0.0	0.0	0.0	1.06	42.2	3.5
E1.004	50.00	2.10	0.267	0.048	0.0	0.0	0.0	1.07	42.6	6.5
E1.005	50.00	2.18	0.235	0.048	0.0	0.0	0.0	1.07	42.6	6.5
E1.006	50.00	2.34	0.077	0.232	0.0	0.0	0.0	1.54	193.5	31.4
E1.007	50.00	2.50	0.077	0.232	0.0	0.0	0.0	1.54	193.5	31.4
E1.008	50.00	2.84	0.077	0.246	0.0	0.0	0.0	1.11	78.2	33.3
E1.009	50.00	3.05	-0.035	0.246	0.0	0.0	0.0	1.57	111.1	33.3
E2.000	50.00	1.48	-0.080	0.021	0.0	0.0	0.0	0.82	14.5	2.8
E1.010	50.00	3.21	-0.238	0.267	0.0	0.0	0.0	1.57	111.1	36.2
E1.011	50.00	3.32	-0.387	0.267	0.0	0.0	0.0	1.00	17.8«	36.2

AECOM		Page 3
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

PIPELINE SCHEDULES for Existing

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)
E1.000	o	225	ESW01	1.435	0.707	0.503	Open Manhole	1200
E1.001	o	225	ESW02	1.435	0.651	0.559	Open Manhole	1200
E1.002	o	225	ESW03	1.435	0.389	0.821	Open Manhole	1200
E1.003	o	225	ESW04	2.750	0.322	2.203	Open Manhole	1200
E1.004	o	225	ESW05	2.750	0.267	2.258	Open Manhole	1200
E1.005	o	225	EFAKE01	1.400	0.235	0.940	Junction	
E1.006	o	400	EINLET	1.300	0.077	0.823	Open Manhole	1350
E1.007	o	400	EFAKE02	1.300	0.077	0.823	Junction	
E1.008	o	300	EOUTLET	1.300	0.077	0.923	Open Manhole	1350
E1.009	o	300	ESW06	1.320	-0.035	1.055	Open Manhole	1200
E2.000	o	150	ESW09	1.435	-0.080	1.365	Open Manhole	1200
E1.010	o	300	ESW07	1.300	-0.238	1.238	Open Manhole	1200
E1.011	o	150	ESW08	2.050	-0.387	2.287	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)
E1.000	8.434	150.6	ESW02	1.435	0.651	0.559	Open Manhole	1200
E1.001	39.291	150.0	ESW03	1.435	0.389	0.821	Open Manhole	1200
E1.002	9.979	148.9	ESW04	2.750	0.322	2.203	Open Manhole	1200
E1.003	8.009	151.1	ESW05	2.750	0.269	2.256	Open Manhole	1200
E1.004	4.891	148.2	EFAKE01	1.400	0.234	0.941	Junction	
E1.005	4.891	148.2	EINLET	1.300	0.202	0.873	Open Manhole	1350
E1.006	14.681	149.8	EFAKE02	1.300	-0.021	0.921	Junction	
E1.007	14.681	149.8	EOUTLET	1.300	-0.021	0.921	Open Manhole	1350
E1.008	22.673	200.6	ESW06	1.320	-0.036	1.056	Open Manhole	1200
E1.009	20.289	100.0	ESW07	1.300	-0.238	1.238	Open Manhole	1200
E2.000	23.632	149.6	ESW07	1.300	-0.238	1.388	Open Manhole	1200
E1.010	14.953	100.0	ESW08	2.050	-0.388	2.138	Open Manhole	1200
E1.011	6.588	100.0	E	2.050	-0.453	2.353	Open Manhole	0

AECOM		Page 4
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019	Designed by SK	
File 2L.S . SURFACE WATER MODEL.MDX	Checked by RP	
XP Solutions	Network 2018.1	

Area Summary for Existing

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.010	0.010	0.010
1.001	-	-	100	0.016	0.016	0.016
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.022	0.022	0.022
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.184	0.184	0.184
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.014	0.014	0.014
1.009	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.021	0.021	0.021
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.267	0.267	0.267

Surcharged Outfall Details for Existing

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

E1.011 E 2.050 -0.453 0.000 0 0

Datum (m) -0.453 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
15	1.200	465	1.200	915	1.200	1365	1.200	1815	1.200	2265	1.200	2715	1.200
30	1.200	480	1.200	930	1.200	1380	1.200	1830	1.200	2280	1.200	2730	1.200
45	1.200	495	1.200	945	1.200	1395	1.200	1845	1.200	2295	1.200	2745	1.200
60	1.200	510	1.200	960	1.200	1410	1.200	1860	1.200	2310	1.200	2760	1.200
75	1.200	525	1.200	975	1.200	1425	1.200	1875	1.200	2325	1.200	2775	1.200
90	1.200	540	1.200	990	1.200	1440	1.200	1890	1.200	2340	1.200	2790	1.200
105	1.200	555	1.200	1005	1.200	1455	1.200	1905	1.200	2355	1.200	2805	1.200
120	1.200	570	1.200	1020	1.200	1470	1.200	1920	1.200	2370	1.200	2820	1.200
135	1.200	585	1.200	1035	1.200	1485	1.200	1935	1.200	2385	1.200	2835	1.200
150	1.200	600	1.200	1050	1.200	1500	1.200	1950	1.200	2400	1.200	2850	1.200
165	1.200	615	1.200	1065	1.200	1515	1.200	1965	1.200	2415	1.200	2865	1.200
180	1.200	630	1.200	1080	1.200	1530	1.200	1980	1.200	2430	1.200	2880	1.200
195	1.200	645	1.200	1095	1.200	1545	1.200	1995	1.200	2445	1.200	2895	1.200
210	1.200	660	1.200	1110	1.200	1560	1.200	2010	1.200	2460	1.200	2910	1.200
225	1.200	675	1.200	1125	1.200	1575	1.200	2025	1.200	2475	1.200	2925	1.200
240	1.200	690	1.200	1140	1.200	1590	1.200	2040	1.200	2490	1.200	2940	1.200
255	1.200	705	1.200	1155	1.200	1605	1.200	2055	1.200	2505	1.200	2955	1.200
270	1.200	720	1.200	1170	1.200	1620	1.200	2070	1.200	2520	1.200	2970	1.200
285	1.200	735	1.200	1185	1.200	1635	1.200	2085	1.200	2535	1.200	2985	1.200
300	1.200	750	1.200	1200	1.200	1650	1.200	2100	1.200	2550	1.200	3000	1.200
315	1.200	765	1.200	1215	1.200	1665	1.200	2115	1.200	2565	1.200	3015	1.200
330	1.200	780	1.200	1230	1.200	1680	1.200	2130	1.200	2580	1.200	3030	1.200
345	1.200	795	1.200	1245	1.200	1695	1.200	2145	1.200	2595	1.200	3045	1.200
360	1.200	810	1.200	1260	1.200	1710	1.200	2160	1.200	2610	1.200	3060	1.200
375	1.200	825	1.200	1275	1.200	1725	1.200	2175	1.200	2625	1.200	3075	1.200
390	1.200	840	1.200	1290	1.200	1740	1.200	2190	1.200	2640	1.200	3090	1.200
405	1.200	855	1.200	1305	1.200	1755	1.200	2205	1.200	2655	1.200	3105	1.200
420	1.200	870	1.200	1320	1.200	1770	1.200	2220	1.200	2670	1.200	3120	1.200
435	1.200	885	1.200	1335	1.200	1785	1.200	2235	1.200	2685	1.200	3135	1.200
450	1.200	900	1.200	1350	1.200	1800	1.200	2250	1.200	2700	1.200	3150	1.200

AECOM		Page 5
Midpoint Alencon Link Basingstoke	SUFRACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

Surcharged Outfall Details for Existing

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
3615	1.200	4530	1.200	5445	1.200	6360	1.200	7275	1.200	8190	1.200	9105	1.200
3630	1.200	4545	1.200	5460	1.200	6375	1.200	7290	1.200	8205	1.200	9120	1.200
3645	1.200	4560	1.200	5475	1.200	6390	1.200	7305	1.200	8220	1.200	9135	1.200
3660	1.200	4575	1.200	5490	1.200	6405	1.200	7320	1.200	8235	1.200	9150	1.200
3675	1.200	4590	1.200	5505	1.200	6420	1.200	7335	1.200	8250	1.200	9165	1.200
3690	1.200	4605	1.200	5520	1.200	6435	1.200	7350	1.200	8265	1.200	9180	1.200
3705	1.200	4620	1.200	5535	1.200	6450	1.200	7365	1.200	8280	1.200	9195	1.200
3720	1.200	4635	1.200	5550	1.200	6465	1.200	7380	1.200	8295	1.200	9210	1.200
3735	1.200	4650	1.200	5565	1.200	6480	1.200	7395	1.200	8310	1.200	9225	1.200
3750	1.200	4665	1.200	5580	1.200	6495	1.200	7410	1.200	8325	1.200	9240	1.200
3765	1.200	4680	1.200	5595	1.200	6510	1.200	7425	1.200	8340	1.200	9255	1.200
3780	1.200	4695	1.200	5610	1.200	6525	1.200	7440	1.200	8355	1.200	9270	1.200
3795	1.200	4710	1.200	5625	1.200	6540	1.200	7455	1.200	8370	1.200	9285	1.200
3810	1.200	4725	1.200	5640	1.200	6555	1.200	7470	1.200	8385	1.200	9300	1.200
3825	1.200	4740	1.200	5655	1.200	6570	1.200	7485	1.200	8400	1.200	9315	1.200
3840	1.200	4755	1.200	5670	1.200	6585	1.200	7500	1.200	8415	1.200	9330	1.200
3855	1.200	4770	1.200	5685	1.200	6600	1.200	7515	1.200	8430	1.200	9345	1.200
3870	1.200	4785	1.200	5700	1.200	6615	1.200	7530	1.200	8445	1.200	9360	1.200
3885	1.200	4800	1.200	5715	1.200	6630	1.200	7545	1.200	8460	1.200	9375	1.200
3900	1.200	4815	1.200	5730	1.200	6645	1.200	7560	1.200	8475	1.200	9390	1.200
3915	1.200	4830	1.200	5745	1.200	6660	1.200	7575	1.200	8490	1.200	9405	1.200
3930	1.200	4845	1.200	5760	1.200	6675	1.200	7590	1.200	8505	1.200	9420	1.200
3945	1.200	4860	1.200	5775	1.200	6690	1.200	7605	1.200	8520	1.200	9435	1.200
3960	1.200	4875	1.200	5790	1.200	6705	1.200	7620	1.200	8535	1.200	9450	1.200
3975	1.200	4890	1.200	5805	1.200	6720	1.200	7635	1.200	8550	1.200	9465	1.200
3990	1.200	4905	1.200	5820	1.200	6735	1.200	7650	1.200	8565	1.200	9480	1.200
4005	1.200	4920	1.200	5835	1.200	6750	1.200	7665	1.200	8580	1.200	9495	1.200
4020	1.200	4935	1.200	5850	1.200	6765	1.200	7680	1.200	8595	1.200	9510	1.200
4035	1.200	4950	1.200	5865	1.200	6780	1.200	7695	1.200	8610	1.200	9525	1.200
4050	1.200	4965	1.200	5880	1.200	6795	1.200	7710	1.200	8625	1.200	9540	1.200
4065	1.200	4980	1.200	5895	1.200	6810	1.200	7725	1.200	8640	1.200	9555	1.200
4080	1.200	4995	1.200	5910	1.200	6825	1.200	7740	1.200	8655	1.200	9570	1.200
4095	1.200	5010	1.200	5925	1.200	6840	1.200	7755	1.200	8670	1.200	9585	1.200
4110	1.200	5025	1.200	5940	1.200	6855	1.200	7770	1.200	8685	1.200	9600	1.200
4125	1.200	5040	1.200	5955	1.200	6870	1.200	7785	1.200	8700	1.200	9615	1.200
4140	1.200	5055	1.200	5970	1.200	6885	1.200	7800	1.200	8715	1.200	9630	1.200
4155	1.200	5070	1.200	5985	1.200	6900	1.200	7815	1.200	8730	1.200	9645	1.200
4170	1.200	5085	1.200	6000	1.200	6915	1.200	7830	1.200	8745	1.200	9660	1.200
4185	1.200	5100	1.200	6015	1.200	6930	1.200	7845	1.200	8760	1.200	9675	1.200
4200	1.200	5115	1.200	6030	1.200	6945	1.200	7860	1.200	8775	1.200	9690	1.200
4215	1.200	5130	1.200	6045	1.200	6960	1.200	7875	1.200	8790	1.200	9705	1.200
4230	1.200	5145	1.200	6060	1.200	6975	1.200	7890	1.200	8805	1.200	9720	1.200
4245	1.200	5160	1.200	6075	1.200	6990	1.200	7905	1.200	8820	1.200	9735	1.200
4260	1.200	5175	1.200	6090	1.200	7005	1.200	7920	1.200	8835	1.200	9750	1.200
4275	1.200	5190	1.200	6105	1.200	7020	1.200	7935	1.200	8850	1.200	9765	1.200
4290	1.200	5205	1.200	6120	1.200	7035	1.200	7950	1.200	8865	1.200	9780	1.200
4305	1.200	5220	1.200	6135	1.200	7050	1.200	7965	1.200	8880	1.200	9795	1.200
4320	1.200	5235	1.200	6150	1.200	7065	1.200	7980	1.200	8895	1.200	9810	1.200
4335	1.200	5250	1.200	6165	1.200	7080	1.200	7995	1.200	8910	1.200	9825	1.200
4350	1.200	5265	1.200	6180	1.200	7095	1.200	8010	1.200	8925	1.200	9840	1.200
4365	1.200	5280	1.200	6195	1.200	7110	1.200	8025	1.200	8940	1.200	9855	1.200
4380	1.200	5295	1.200	6210	1.200	7125	1.200	8040	1.200	8955	1.200	9870	1.200
4395	1.200	5310	1.200	6225	1.200	7140	1.200	8055	1.200	8970	1.200	9885	1.200
4410	1.200	5325	1.200	6240	1.200	7155	1.200	8070	1.200	8985	1.200	9900	1.200
4425	1.200	5340	1.200	6255	1.200	7170	1.200	8085	1.200	9000	1.200	9915	1.200
4440	1.200	5355	1.200	6270	1.200	7185	1.200	8100	1.200	9015	1.200	9930	1.200
4455	1.200	5370	1.200	6285	1.200	7200	1.200	8115	1.200	9030	1.200	9945	1.200
4470	1.200	5385	1.200	6300	1.200	7215	1.200	8130	1.200	9045	1.200	9960	1.200
4485	1.200	5400	1.200	6315	1.200	7230	1.200	8145	1.200	9060	1.200	9975	1.200
4500	1.200	5415	1.200	6330	1.200	7245	1.200	8160	1.200	9075	1.200	9990	1.200
4515	1.200	5430	1.200	6345	1.200	7260	1.200	8175	1.200	9090	1.200	10005	1.200

Surcharged Outfall Details for Existing											
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
10935	1.200	11850	1.200	12765	1.200	13680	1.200	14595	1.200	15510	1.200
10950	1.200	11865	1.200	12780	1.200	13695	1.200	14610	1.200	15525	1.200
10965	1.200	11880	1.200	12795	1.200	13710	1.200	14625	1.200	15540	1.200
10980	1.200	11895	1.200	12810	1.200	13725	1.200	14640	1.200	15555	1.200
10995	1.200	11910	1.200	12825	1.200	13740	1.200	14655	1.200	15570	1.200
11010	1.200	11925	1.200	12840	1.200	13755	1.200	14670	1.200	15585	1.200
11025	1.200	11940	1.200	12855	1.200	13770	1.200	14685	1.200	15600	1.200
11040	1.200	11955	1.200	12870	1.200	13785	1.200	14700	1.200	15615	1.200
11055	1.200	11970	1.200	12885	1.200	13800	1.200	14715	1.200	15630	1.200
11070	1.200	11985	1.200	12900	1.200	13815	1.200	14730	1.200	15645	1.200
11085	1.200	12000	1.200	12915	1.200	13830	1.200	14745	1.200	15660	1.200
11100	1.200	12015	1.200	12930	1.200	13845	1.200	14760	1.200	15675	1.200
11115	1.200	12030	1.200	12945	1.200	13860	1.200	14775	1.200	15690	1.200
11130	1.200	12045	1.200	12960	1.200	13875	1.200	14790	1.200	15705	1.200
11145	1.200	12060	1.200	12975	1.200	13890	1.200	14805	1.200	15720	1.200
11160	1.200	12075	1.200	12990	1.200	13905	1.200	14820	1.200	15735	1.200
11175	1.200	12090	1.200	13005	1.200	13920	1.200	14835	1.200	15750	1.200
11190	1.200	12105	1.200	13020	1.200	13935	1.200	14850	1.200	15765	1.200
11205	1.200	12120	1.200	13035	1.200	13950	1.200	14865	1.200	15780	1.200
11220	1.200	12135	1.200	13050	1.200	13965	1.200	14880	1.200	15795	1.200
11235	1.200	12150	1.200	13065	1.200	13980	1.200	14895	1.200	15810	1.200
11250	1.200	12165	1.200	13080	1.200	13995	1.200	14910	1.200	15825	1.200
11265	1.200	12180	1.200	13095	1.200	14010	1.200	14925	1.200	15840	1.200
11280	1.200	12195	1.200	13110	1.200	14025	1.200	14940	1.200	15855	1.200
11295	1.200	12210	1.200	13125	1.200	14040	1.200	14955	1.200	15870	1.200
11310	1.200	12225	1.200	13140	1.200	14055	1.200	14970	1.200	15885	1.200
11325	1.200	12240	1.200	13155	1.200	14070	1.200	14985	1.200	15900	1.200
11340	1.200	12255	1.200	13170	1.200	14085	1.200	15000	1.200	15915	1.200
11355	1.200	12270	1.200	13185	1.200	14100	1.200	15015	1.200	15930	1.200
11370	1.200	12285	1.200	13200	1.200	14115	1.200	15030	1.200	15945	1.200
11385	1.200	12300	1.200	13215	1.200	14130	1.200	15045	1.200	15960	1.200
11400	1.200	12315	1.200	13230	1.200	14145	1.200	15060	1.200	15975	1.200
11415	1.200	12330	1.200	13245	1.200	14160	1.200	15075	1.200	15990	1.200
11430	1.200	12345	1.200	13260	1.200	14175	1.200	15090	1.200	16005	1.200
11445	1.200	12360	1.200	13275	1.200	14190	1.200	15105	1.200	16020	1.200
11460	1.200	12375	1.200	13290	1.200	14205	1.200	15120	1.200	16035	1.200
11475	1.200	12390	1.200	13305	1.200	14220	1.200	15135	1.200	16050	1.200
11490	1.200	12405	1.200	13320	1.200	14235	1.200	15150	1.200	16065	1.200
11505	1.200	12420	1.200	13335	1.200	14250	1.200	15165	1.200	16080	1.200
11520	1.200	12435	1.200	13350	1.200	14265	1.200	15180	1.200	16095	1.200
11535	1.200	12450	1.200	13365	1.200	14280	1.200	15195	1.200	16110	1.200
11550	1.200	12465	1.200	13380	1.200	14295	1.200	15210	1.200	16125	1.200
11565	1.200	12480	1.200	13395	1.200	14310	1.200	15225	1.200	16140	1.200
11580	1.200	12495	1.200	13410	1.200	14325	1.200	15240	1.200	16155	1.200
11595	1.200	12510	1.200	13425	1.200	14340	1.200	15255	1.200	16170	1.200
11610	1.200	12525	1.200	13440	1.200	14355	1.200	15270	1.200	16185	1.200
11625	1.200	12540	1.200	13455	1.200	14370	1.200	15285	1.200	16200	1.200
11640	1.200	12555	1.200	13470	1.200	14385	1.200	15300	1.200	16215	1.200
11655	1.200	12570	1.200	13485	1.200	14400	1.200	15315	1.200	16230	1.200
11670	1.200	12585	1.200	13500	1.200	14415	1.200	15330	1.200	16245	1.200
11685	1.200	12600	1.200	13515	1.200	14430	1.200	15345	1.200	16260	1.200
11700	1.200	12615	1.200	13530	1.200	14445	1.200	15360	1.200	16275	1.200
11715	1.200	12630	1.200	13545	1.200	14460	1.200	15375	1.200	16290	1.200
11730	1.200	12645	1.200	13560	1.200	14475	1.200	15390	1.200	16305	1.200
11745	1.200	12660	1.200	13575	1.200	14490	1.200	15405	1.200	16320	1.200
11760	1.200	12675	1.200	13590	1.200	14505	1.200	15420	1.200	16335	1.200
11775	1.200	12690	1.200	13605	1.200	14520	1.200	15435	1.200	16350	1.200
11790	1.200	12705	1.200	13620	1.200	14535	1.200	15450	1.200	16365	1.200
11805	1.200	12720	1.200	13635	1.200	14550	1.200	15465	1.200	16380	1.200
11820	1.200	12735	1.200	13650	1.200	14565	1.200	15480	1.200	16395	1.200
11835	1.200	12750	1.200	13665	1.200	14580	1.200	15495	1.200	16410	1.200

Surcharged Outfall Details for Existing

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
18255	1.200	18495	1.200	18735	1.200	18975	1.200	19215	1.200	19455	1.200	19695	1.200	19935	1.200
18270	1.200	18510	1.200	18750	1.200	18990	1.200	19230	1.200	19470	1.200	19710	1.200	19950	1.200
18285	1.200	18525	1.200	18765	1.200	19005	1.200	19245	1.200	19485	1.200	19725	1.200	19965	1.200
18300	1.200	18540	1.200	18780	1.200	19020	1.200	19260	1.200	19500	1.200	19740	1.200	19980	1.200
18315	1.200	18555	1.200	18795	1.200	19035	1.200	19275	1.200	19515	1.200	19755	1.200	19995	1.200
18330	1.200	18570	1.200	18810	1.200	19050	1.200	19290	1.200	19530	1.200	19770	1.200	20010	1.200
18345	1.200	18585	1.200	18825	1.200	19065	1.200	19305	1.200	19545	1.200	19785	1.200	20025	1.200
18360	1.200	18600	1.200	18840	1.200	19080	1.200	19320	1.200	19560	1.200	19800	1.200	20040	1.200
18375	1.200	18615	1.200	18855	1.200	19095	1.200	19335	1.200	19575	1.200	19815	1.200	20055	1.200
18390	1.200	18630	1.200	18870	1.200	19110	1.200	19350	1.200	19590	1.200	19830	1.200	20070	1.200
18405	1.200	18645	1.200	18885	1.200	19125	1.200	19365	1.200	19605	1.200	19845	1.200	20085	1.200
18420	1.200	18660	1.200	18900	1.200	19140	1.200	19380	1.200	19620	1.200	19860	1.200	20100	1.200
18435	1.200	18675	1.200	18915	1.200	19155	1.200	19395	1.200	19635	1.200	19875	1.200	20115	1.200
18450	1.200	18690	1.200	18930	1.200	19170	1.200	19410	1.200	19650	1.200	19890	1.200	20130	1.200
18465	1.200	18705	1.200	18945	1.200	19185	1.200	19425	1.200	19665	1.200	19905	1.200	20145	1.200
18480	1.200	18720	1.200	18960	1.200	19200	1.200	19440	1.200	19680	1.200	19920	1.200	20160	1.200

Simulation Criteria for Existing

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	1200
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	10
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	2	Number of Storage Structures	1
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	600
Ratio R	0.350		

AECOM		Page 8
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019	Designed by SK	
File 2L.S . SURFACE WATER MODEL.MDX	Checked by RP	
XP Solutions	Network 2018.1	

Online Controls for Existing

Hydro-Brake® Optimum Manhole: ESW07, DS/PN: E1.010, Volume (m³): 3.5

Unit Reference	MD-SHE-0069-2000-0900-2000
Design Head (m)	0.900
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	69
Invert Level (m)	-0.238
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	2.0	Kick-Flo®	0.568	1.6
Flush-Flo™	0.278	2.0	Mean Flow over Head Range	-	1.8

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	0.800	1.9	2.000	2.9	4.000	4.0	7.000	5.2
0.200	2.0	1.000	2.1	2.200	3.0	4.500	4.2	7.500	5.3
0.300	2.0	1.200	2.3	2.400	3.1	5.000	4.4	8.000	5.5
0.400	1.9	1.400	2.4	2.600	3.2	5.500	4.6	8.500	5.7
0.500	1.8	1.600	2.6	3.000	3.5	6.000	4.8	9.000	5.8
0.600	1.7	1.800	2.7	3.500	3.7	6.500	5.0	9.500	6.0

Non Return Valve Manhole: ESW08, DS/PN: E1.011, Volume (m³): 3.7

AECOM		Page 9
Midpoint Alencon Link Basingstoke	SUFRACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

Storage Structures for Existing

Tank or Pond Manhole: EFAKE02, DS/PN: E1.007

Invert Level (m) 0.077

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	181.9	0.600	306.2	1.200	451.1
0.300	241.3	0.900	376.1	1.201	0.0

AECOM		Page 10
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
E1.000	ESW01	15 Summer	1	+0%					0.743	-0.189
E1.001	ESW02	15 Summer	1	+0%	100/2160 Winter				0.693	-0.183
E1.002	ESW03	4320 Winter	1	+0%	30/1440 Winter				0.487	-0.127
E1.003	ESW04	4320 Winter	1	+0%	30/720 Winter				0.487	-0.060
E1.004	ESW05	4320 Winter	1	+0%	30/360 Winter				0.487	-0.005
E1.005	EFAKE01	4320 Winter	1	+0%					0.460	0.000
E1.006	EINLET	4320 Winter	1	+0%	1/4320 Winter				0.487	0.010
E1.007	EFAKE02	4320 Winter	1	+0%	1/4320 Winter				0.487	0.010
E1.008	EOUTLET	4320 Winter	1	+0%	1/2160 Summer				0.495	0.118
E1.009	ESW06	4320 Winter	1	+0%	1/360 Winter				0.504	0.239
E2.000	ESW09	4320 Winter	1	+0%	1/15 Summer				0.500	0.430
E1.010	ESW07	4320 Winter	1	+0%	1/15 Summer				0.505	0.443
E1.011	ESW08	4320 Winter	1	+0%	1/15 Summer				0.491	0.728

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	Flow (l/s)		
E1.000	ESW01	0.000	0.05	1.8		OK	
E1.001	ESW02	0.000	0.07	3.0		OK	
E1.002	ESW03	0.000	0.00	0.1		OK	
E1.003	ESW04	0.000	0.00	0.1		OK	
E1.004	ESW05	0.000	0.01	0.2		OK	
E1.005	EFAKE01	0.000	0.01	0.2		SURCHARGED*	
E1.006	EINLET	0.000	0.01	0.9		SURCHARGED	
E1.007	EFAKE02	0.000	0.01	2.0		SURCHARGED*	
E1.008	EOUTLET	0.000	0.01	0.9		SURCHARGED	
E1.009	ESW06	0.000	0.00	0.4		SURCHARGED	
E2.000	ESW09	0.000	0.02	0.2		SURCHARGED	
E1.010	ESW07	0.000	0.00	0.1		SURCHARGED	
E1.011	ESW08	0.000	0.00	0.0		SURCHARGED	

AECOM		Page 11
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019	Designed by SK	
File 2L.S . SURFACE WATER MODEL.MDX	Checked by RP	
XP Solutions	Network 2018.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
E1.000	ESW01	15 Summer	30	+0%					0.765	-0.167
E1.001	ESW02	4320 Winter	30	+0%	100/2160 Winter				0.759	-0.117
E1.002	ESW03	4320 Winter	30	+0%	30/1440 Winter				0.759	0.145
E1.003	ESW04	4320 Winter	30	+0%	30/720 Winter				0.759	0.212
E1.004	ESW05	4320 Winter	30	+0%	30/360 Winter				0.759	0.267
E1.005	EFAKE01	360 Winter	30	+0%					0.460	0.000
E1.006	EINLET	4320 Winter	30	+0%	1/4320 Winter				0.759	0.282
E1.007	EFAKE02	4320 Winter	30	+0%	1/4320 Winter				0.759	0.282
E1.008	EOUTLET	4320 Winter	30	+0%	1/2160 Summer				0.776	0.399
E1.009	ESW06	4320 Winter	30	+0%	1/360 Winter				0.798	0.533
E2.000	ESW09	4320 Winter	30	+0%	1/15 Summer				0.787	0.717
E1.010	ESW07	4320 Winter	30	+0%	1/15 Summer				0.800	0.738
E1.011	ESW08	4320 Winter	30	+0%	1/15 Summer				0.750	0.987

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
E1.000	ESW01	0.000	0.14	4.5	OK	
E1.001	ESW02	0.000	0.00	0.2	OK	
E1.002	ESW03	0.000	0.01	0.2	SURCHARGED	
E1.003	ESW04	0.000	0.01	0.2	SURCHARGED	
E1.004	ESW05	0.000	0.01	0.4	SURCHARGED	
E1.005	EFAKE01	0.000	0.07	2.2	SURCHARGED*	
E1.006	EINLET	0.000	0.01	1.7	SURCHARGED	
E1.007	EFAKE02	0.000	0.03	4.7	SURCHARGED*	
E1.008	EOUTLET	0.000	0.03	2.3	SURCHARGED	
E1.009	ESW06	0.000	0.01	1.2	SURCHARGED	
E2.000	ESW09	0.000	0.04	0.6	SURCHARGED	
E1.010	ESW07	0.000	0.00	0.4	SURCHARGED	

AECOM		Page 12
Midpoint Alencon Link Basingstoke	SUFRACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

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

PN	US/MH Name	Flooded	Flow / Overflow Cap. (l/s)	Pipe	Status	Level Exceeded
		Volume (m³)		Flow (l/s)		
E1.011	ESW08	0.000	0.02	0.3	SURCHARGED	

AECOM		Page 13
Midpoint Alencon Link Basingstoke	SURFACE WATER University of Chichester	
Date 13/02/2019	Designed by SK	
File 2L.S . SURFACE WATER MODEL.MDX	Checked by RP	
XP Solutions	Network 2018.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
E1.000	ESW01	2880 Winter	100	+40%					0.890	-0.042
E1.001	ESW02	2880 Winter	100	+40%	100/2160 Winter				0.890	0.014
E1.002	ESW03	2880 Winter	100	+40%	30/1440 Winter				0.890	0.276
E1.003	ESW04	2880 Winter	100	+40%	30/720 Winter				0.890	0.343
E1.004	ESW05	2880 Winter	100	+40%	30/360 Winter				0.890	0.398
E1.005	EFAKE01	180 Winter	100	+40%					0.460	0.000
E1.006	EINLET	2880 Winter	100	+40%	1/4320 Winter				0.889	0.412
E1.007	EFAKE02	2880 Winter	100	+40%	1/4320 Winter				0.889	0.412
E1.008	EOUTLET	2880 Winter	100	+40%	1/2160 Summer				0.912	0.535
E1.009	ESW06	2880 Winter	100	+40%	1/360 Winter				0.938	0.673
E2.000	ESW09	2880 Winter	100	+40%	1/15 Summer				0.922	0.852
E1.010	ESW07	2880 Winter	100	+40%	1/15 Summer				0.938	0.876
E1.011	ESW08	2880 Winter	100	+40%	1/15 Summer				0.752	0.989

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
E1.000	ESW01	0.000	0.01	0.2	OK	
E1.001	ESW02	0.000	0.01	0.4	SURCHARGED	
E1.002	ESW03	0.000	0.01	0.4	SURCHARGED	
E1.003	ESW04	0.000	0.01	0.4	SURCHARGED	
E1.004	ESW05	0.000	0.02	0.7	SURCHARGED	
E1.005	EFAKE01	0.000	0.22	6.5	SURCHARGED*	
E1.006	EINLET	0.000	0.03	3.8	SURCHARGED	
E1.007	EFAKE02	0.000	0.06	8.1	SURCHARGED*	
E1.008	EOUTLET	0.000	0.07	4.8	SURCHARGED	
E1.009	ESW06	0.000	0.03	3.0	SURCHARGED	
E2.000	ESW09	0.000	0.08	1.0	SURCHARGED	
E1.010	ESW07	0.000	0.02	1.7	SURCHARGED	

AECOM		Page 14
Midpoint Alencon Link Basingstoke	SUFRACE WATER University of Chichester	
Date 13/02/2019 File 2L.S . SURFACE WATER MODEL.MDX	Designed by SK Checked by RP	
XP Solutions	Network 2018.1	

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

PN	US/MH Name	Flooded	Flow / Overflow Cap. (l/s)	Pipe	Status	Level Exceeded
		Volume (m³)		Flow (l/s)		
E1.011	ESW08	0.000	0.11	1.7	SURCHARGED	