

AECOM		Page 1
Midpoint Alencon Link Basingstoke, RG21 7PP	Engineer	
Date 20/11/2023 File 4.8 DRAINAGE.MDX	Designed by TA Checked by Stephen McCann	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	1999
Site Location GB 529200 120700 TQ 29200 20700	
C (1km)	-0.027
D1 (1km)	0.383
D2 (1km)	0.289
D3 (1km)	0.420
E (1km)	0.316
F (1km)	2.478
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	300

Designed with Level Soffits

Network Design Table for Storm

« - 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
S1.000	30.527	0.136	224.5	0.046	5.00	0.0	0.600		o	225	Pipe/Conduit	
S1.001	40.418	0.337	119.9	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.002	23.152	0.169	137.0	0.047	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.003	23.975	1.136	21.1	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.004	33.858	0.246	137.6	0.000	0.00	0.0	0.600		o	1050	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)
S1.000	296.30	5.59	27.470	0.046	0.0	0.0	0.0	0.87	34.5«	49.2
S1.001	275.88	6.15	27.334	0.046	0.0	0.0	0.0	1.19	47.4«	49.2
S1.002	264.91	6.50	26.997	0.093	0.0	0.0	0.0	1.12	44.3«	89.0
S1.003	260.77	6.64	26.828	0.093	0.0	0.0	0.0	2.86	113.8	89.0
S1.004	255.31	6.83	24.867	0.093	0.0	0.0	0.0	2.94	2542.1	89.0

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Network Design Table for Storm

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
S2.000	2.509	0.035	71.7	0.034	5.00	0.0	0.600		o	300	Pipe/Conduit	
S2.001	41.579	0.139	299.1	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S3.000	2.672	0.046	58.1	0.033	5.00	0.0	0.600		o	100	Pipe/Conduit	
S2.002	31.021	0.103	301.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S2.003	12.282	0.041	299.6	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S4.000	2.803	0.048	58.4	0.049	5.00	0.0	0.600		o	100	Pipe/Conduit	
S2.004	22.958	0.077	298.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S5.000	47.498	0.158	300.0	0.021	5.00	0.0	0.600		o	225	Pipe/Conduit	
S5.001	8.685	0.334	26.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.005	38.230	0.127	301.0	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S6.000	4.358	0.044	99.0	0.060	5.00	0.0	0.600		o	100	Pipe/Conduit	
S2.006	8.833	0.030	294.4	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)
S2.000	320.58	5.02	25.923	0.034	0.0	0.0	0.0	1.86	131.4	39.4
S2.001	288.54	5.79	25.888	0.034	0.0	0.0	0.0	0.90	63.9	39.4
S3.000	319.57	5.04	26.150	0.033	0.0	0.0	0.0	1.01	8.0«	38.1
S2.002	269.02	6.36	25.749	0.067	0.0	0.0	0.0	0.90	63.7«	65.1
S2.003	262.13	6.59	25.646	0.067	0.0	0.0	0.0	0.90	63.8«	65.1
S4.000	319.46	5.05	26.927	0.049	0.0	0.0	0.0	1.01	7.9«	56.5
S2.004	250.32	7.01	25.605	0.116	0.0	0.0	0.0	0.91	64.0«	104.9
S5.000	279.07	6.06	27.900	0.021	0.0	0.0	0.0	0.75	29.8	21.2
S5.001	277.16	6.11	27.700	0.021	0.0	0.0	0.0	2.58	102.4	21.2
S2.005	235.24	7.63	25.453	0.137	0.0	0.0	0.0	1.04	114.8«	116.4
S6.000	317.24	5.09	26.890	0.060	0.0	0.0	0.0	0.77	6.1«	68.7
S2.006	232.09	7.77	25.326	0.197	0.0	0.0	0.0	1.05	116.1«	165.1

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Network Design Table for Storm

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
S12.000	7.802	0.078	100.0	0.041	5.00	0.0	0.600		o	100	Pipe/Conduit	
S1.011	30.859	0.103	299.6	0.000	0.00	0.0	0.600		o	1050	Pipe/Conduit	
S1.012	37.349	0.124	301.2	0.000	0.00	0.0	0.600		o	1050	Pipe/Conduit	
S13.000	6.407	0.064	100.0	0.095	5.00	0.0	0.600		o	100	Pipe/Conduit	
S1.013	31.401	0.105	299.1	0.000	0.00	0.0	0.600		o	1050	Pipe/Conduit	
S14.000	3.044	0.030	101.5	0.143	5.00	0.0	0.600		o	100	Pipe/Conduit	
S1.014	33.713	0.112	301.0	0.000	0.00	0.0	0.600		o	1050	Pipe/Conduit	
S1.015	14.999	0.050	300.0	0.000	0.00	0.0	0.600		o	1050	Pipe/Conduit	
S1.016	66.697	0.217	307.4	0.041	0.00	0.0	0.600		o	450	Pipe/Conduit	
S15.000	65.727	0.219	300.1	0.062	5.00	0.0	0.600		o	300	Pipe/Conduit	
S15.001	66.709	0.667	100.0	0.197	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		
S15.002	66.709	0.667	100.0	0.000	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		
S15.003	37.170	0.372	99.9	0.055	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		
S15.004	20.052	0.201	99.8	0.039	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		
S15.005	15.858	0.159	99.7	0.009	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		
S15.006	10.939	0.109	100.4	0.044	0.00	0.0		0.123 3 \=/	2000	1:3 Swale		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.000	313.82	5.17	24.435	0.041	0.0	0.0	0.0	0.77	6.0«	46.5
S1.011	206.47	9.09	23.147	0.686	0.0	0.0	0.0	1.99	1719.5	511.5
S1.012	201.33	9.41	23.044	0.686	0.0	0.0	0.0	1.98	1714.8	511.5
S13.000	315.19	5.14	23.564	0.095	0.0	0.0	0.0	0.77	6.0«	108.1
S1.013	197.25	9.67	22.920	0.781	0.0	0.0	0.0	1.99	1721.0	556.3
S14.000	318.52	5.07	23.558	0.143	0.0	0.0	0.0	0.76	6.0«	164.5
S1.014	193.07	9.95	22.815	0.924	0.0	0.0	0.0	1.98	1715.4	644.2
S1.015	191.28	10.08	22.703	0.924	0.0	0.0	0.0	1.98	1718.4	644.2
S1.016	178.77	11.04	22.653	0.965	0.0	0.0	0.0	1.15	183.6«	644.2
S15.000	273.79	6.21	25.732	0.062	0.0	0.0	0.0	0.90	63.8	61.3
S15.001	212.25	8.76	25.513	0.259	0.0	0.0	0.0	0.44	995.3	198.5
S15.002	175.67	11.31	24.846	0.259	0.0	0.0	0.0	0.44	995.3	198.5
S15.003	160.93	12.73	24.179	0.314	0.0	0.0	0.0	0.44	995.7	198.5
S15.004	154.12	13.49	23.807	0.353	0.0	0.0	0.0	0.44	996.5	198.5
S15.005	149.19	14.10	23.606	0.362	0.0	0.0	0.0	0.44	996.6	198.5
S15.006	146.00	14.51	23.447	0.406	0.0	0.0	0.0	0.44	993.6	214.0

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Network Design Table for Storm

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
S18.000	15.265	0.163	93.7	1.067	5.00	0.0	0.600			o 675	Pipe/Conduit	
S18.001	29.796	0.140	212.8	0.000	0.00	0.0	0.600			o 225	Pipe/Conduit	
S17.007	25.821	0.086	300.2	0.000	0.00	0.0	0.600			o 300	Pipe/Conduit	
S17.008	40.957	0.137	299.0	0.000	0.00	0.0	0.600			o 300	Pipe/Conduit	
S19.000	57.169	0.350	163.3	0.081	5.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.001	30.701	0.188	163.3	0.072	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.002	38.754	0.238	162.8	0.045	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.003	50.792	0.581	87.4	0.074	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.004	7.190	0.044	163.4	0.020	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.005	26.616	0.163	163.3	0.064	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.006	23.224	0.507	45.8	0.013	0.00	0.0		0.123	3 \=/	2000	1:3 Swale	
S19.007	45.673	0.457	99.9	0.000	0.00	0.0	0.600			o 525	Pipe/Conduit	
S19.008	7.872	0.046	171.1	0.997	0.00	0.0	0.600			o 225	Pipe/Conduit	
S19.009	21.660	0.078	277.7	0.000	0.00	0.0	0.600			o 225	Pipe/Conduit	
S17.009	13.196	0.045	293.2	0.000	0.00	0.0	0.600			o 300	Pipe/Conduit	
S17.010	14.330	0.048	298.5	0.000	0.00	0.0	0.600			o 300	Pipe/Conduit	
S17.011	13.625	0.050	272.5	0.000	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)
S18.000	317.25	5.09	22.840	1.067	0.0	0.0	0.0	2.71	969.4«	1222.3
S18.001	293.78	5.65	22.677	1.067	0.0	0.0	0.0	0.89	35.5«	1222.3
S17.007	186.16	10.46	22.462	2.639	0.0	0.0	0.0	0.90	63.8«	1774.0
S17.008	176.79	11.21	22.376	2.639	0.0	0.0	0.0	0.90	63.9«	1774.0
S19.000	231.57	7.79	25.650	0.081	0.0	0.0	0.0	0.34	778.8	67.7
S19.001	203.26	9.29	25.300	0.153	0.0	0.0	0.0	0.34	778.9	112.3
S19.002	177.21	11.18	25.112	0.198	0.0	0.0	0.0	0.34	780.0	126.7
S19.003	158.52	12.99	24.873	0.272	0.0	0.0	0.0	0.47	1064.5	155.7
S19.004	155.42	13.34	24.265	0.292	0.0	0.0	0.0	0.34	778.6	163.9
S19.005	145.08	14.64	24.237	0.356	0.0	0.0	0.0	0.34	778.9	186.5
S19.006	140.82	15.24	24.058	0.369	0.0	0.0	0.0	0.65	1470.6	187.6
S19.007	138.54	15.58	22.895	0.369	0.0	0.0	0.0	2.24	485.1	187.6
S19.008	137.68	15.71	22.438	1.366	0.0	0.0	0.0	1.00	39.6«	679.1
S19.009	134.75	16.17	22.392	1.366	0.0	0.0	0.0	0.78	31.0«	679.1
S17.009	133.28	16.41	22.138	4.005	0.0	0.0	0.0	0.91	64.5«	1927.5
S17.010	131.71	16.68	22.093	4.005	0.0	0.0	0.0	0.90	64.0«	1927.5
S17.011	130.64	16.86	21.950	4.005	0.0	0.0	0.0	1.23	195.1«	1927.5

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Network Design Table for Storm

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
S1.022	11.785	0.100	117.8	0.141	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.023	10.965	0.100	109.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.024	36.119	0.100	361.2	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S1.025	7.311	0.034	215.0	0.332	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.026	2.513	0.039	64.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S20.000	4.576	0.046	99.5	0.000	5.00	0.0	0.600		o	300	Pipe/Conduit	
S20.001	16.917	0.169	100.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.027	63.626	0.249	255.5	0.000	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)
S1.022	122.60	18.37	21.900	6.034	0.0	0.0	0.0	1.67	184.2<	2671.3
S1.023	122.08	18.48	21.800	6.034	0.0	0.0	0.0	1.73	191.0<	2671.3
S1.024	119.82	18.95	21.700	6.034	0.0	0.0	0.0	1.28	360.6<	2671.3
S1.025	119.29	19.06	21.600	6.366	0.0	0.0	0.0	1.07	75.5<	2742.1
S1.026	119.19	19.08	21.566	6.366	0.0	0.0	0.0	1.97	139.0<	2742.1
S20.000	319.36	5.05	20.150	0.000	0.0	0.0	0.0	1.58	111.4	0.0
S20.001	311.21	5.23	20.104	0.000	0.0	0.0	0.0	1.57	111.1	0.0
S1.027	114.41	20.17	19.801	6.366	0.0	0.0	0.0	0.98	69.2<	2742.1

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Manhole Schedules for Storm									
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)
SMH04-823	28.721	1.251	Open Manhole	1200	S1.000	27.470	225		
SMH04-822	28.999	1.665	Open Manhole	1200	S1.001	27.334	225	S1.000	27.33
SMH04-821	29.092	2.095	Open Manhole	1200	S1.002	26.997	225	S1.001	26.99
SMH04-820	28.925	2.097	Open Manhole	1200	S1.003	26.828	225	S1.002	26.82
SMH04-819	28.648	3.781	Open Manhole	1950	S1.004	24.867	1050	S1.003	25.69
S6	27.573	1.650	Open Manhole	1200	S2.000	25.923	300		
S6	27.992	2.104	Open Manhole	1200	S2.001	25.888	300	S2.000	25.88
S7	27.978	1.828	Open Manhole	1200	S3.000	26.150	100		
S6	27.978	2.229	Open Manhole	1200	S2.002	25.749	300	S2.001	25.74
								S3.000	26.10
S6	28.454	2.808	Open Manhole	1200	S2.003	25.646	300	S2.002	25.64
S9	28.454	1.527	Open Manhole	1200	S4.000	26.927	100		
SMH04-827	29.198	3.593	Open Manhole	1200	S2.004	25.605	300	S2.003	25.60
								S4.000	26.87
SMH04-829	29.153	1.253	Open Manhole	1200	S5.000	27.900	225		
SMH04-828	29.005	1.305	Open Manhole	1200	S5.001	27.700	225	S5.000	27.74
SMH04-826	29.087	3.634	Open Manhole	1350	S2.005	25.453	375	S2.004	25.52
								S5.001	27.36
S13	28.501	1.611	Open Manhole	1200	S6.000	26.890	100		
S10	28.369	3.043	Open Manhole	1350	S2.006	25.326	375	S2.005	25.32
								S6.000	26.84
SMH04-818	28.213	3.742	Open Manhole	2100	S1.005	24.471	1200	S1.004	24.62
								S2.006	25.29
S10	27.980	1.524	Open Manhole	1200	S7.000	26.456	100		
SMH04-817	27.937	3.623	Open Manhole	2100	S1.006	24.314	1200	S1.005	24.31
								S7.000	26.32
S12	27.429	1.533	Open Manhole	1200	S8.000	25.896	100		
SMH04-816	27.433	3.333	Open Manhole	2100	S1.007	24.100	1200	S1.006	24.10
								S8.000	25.81
S20	27.080	1.523	Open Manhole	1200	S9.000	25.557	100		
SMH04-815	27.097	3.154	Open Manhole	2100	S1.008	23.943	600	S1.007	23.94
								S9.000	25.51
S15	26.700	1.629	Open Manhole	1200	S10.000	25.071	100		
SMH04-814	26.687	3.369	Open Manhole	1950	S1.009	23.318	1050	S1.008	23.76
								S10.000	25.01
S23	26.261	1.542	Open Manhole	1200	S11.000	24.719	100		
SMH04-813	26.293	3.062	Open Manhole	1950	S1.010	23.231	1050	S1.009	23.23
								S11.000	24.67
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<u>Manhole Schedules for Storm</u>								
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN
S18	25.961	1.526	Open Manhole	1200	S12.000	24.435	100	
SMH04-812	25.910	2.763	Open Manhole	1950	S1.011	23.147	1050	S1.010
SMH04-811	25.441	2.397	Open Manhole	1950	S1.012	23.044	1050	S12.000
S20	25.238	1.674	Open Manhole	1200	S13.000	23.564	100	S1.011
SMH04-810	25.156	2.236	Open Manhole	1950	S1.013	22.920	1050	S1.012
S29	25.113	1.555	Open Manhole	1200	S14.000	23.558	100	S13.000
SMH04-809	25.417	2.602	Open Manhole	1950	S1.014	22.815	1050	S1.013
SMH04-808	25.677	2.974	Open Manhole	1950	S1.015	22.703	1050	S14.000
SMH04-807	25.290	2.637	Open Manhole	1950	S1.016	22.653	450	S1.014
SMH SR 0-P 10	27.029	1.297	Open Manhole	1200	S15.000	25.732	300	S1.015
SMH SR 0-P 9	26.113	0.600	Open Manhole	1200	S15.001	25.513	2000	S15.000
SMH SR 0-P 8	25.446	0.600	Junction		S15.002	24.846	2000	S15.001
SMH SR 0-P 7	24.779	0.600	Junction		S15.003	24.179	2000	S15.002
SMH SR 0-P 6	24.407	0.600	Junction		S15.004	23.807	2000	S15.003
SMH SR 0-P 5	24.216	0.610	Junction		S15.005	23.606	2000	S15.004
SMH SR 0-P 4	24.047	0.600	Junction		S15.006	23.447	2000	S15.005
SMH SR 0-P 3	23.938	0.600	Junction		S15.007	23.338	2000	S15.006
SMH SR 0-P 2	23.919	1.263	Open Manhole	1200	S15.008	22.656	375	S15.007
SMH SR 0-P 1	23.986	1.423	Open Manhole	1200	S15.009	22.563	375	S15.008
SMH04-832 (P)	23.962	1.438	Open Manhole	1200	S15.010	22.524	375	S15.009
SMH04-806	23.957	1.521	Open Manhole	1350	S1.017	22.437	450	S1.016
SMH04-805	23.911	1.624	Open Manhole	1200	S1.018	22.287	450	S15.010
SMH P2.8aE 0-P 1	23.700	1.218	Open Manhole	1350	S16.000	22.482	450	S1.017
SMH04-831 (P)	23.545	1.110	Open Manhole	1350	S16.001	22.435	225	S16.000
SMH04-804	23.632	1.506	Open Manhole	1350	S1.019	22.126	450	S1.018
SMH04-803	23.737	1.651	Open Manhole	1350	S1.020	22.086	450	S16.001
SP13 INLET 1	23.700	1.755	Open Manhole	1500	S1.021	21.945	525	S1.019
SMH CNC/P2.5 0-P 5	26.876	1.861	Open Manhole	1200	S17.000	25.015	300	S1.020
SMH CNC/P2.5 0-P 4	27.354	2.934	Open Manhole	1350	S17.001	24.420	450	S17.000
SMH CNC/P2.5 0-P 3	27.832	3.593	Open Manhole	1350	S17.002	24.239	450	S17.001
SMH CNC/P2.5 0-P 2	27.337	3.361	Open Manhole	1500	S17.003	23.976	525	S17.002
SMH CNC/P2.5 0-P 1	25.202	2.094	Open Manhole	1500	S17.004	23.108	600	S17.003
SMH04-837 (P)	24.259	1.585	Open Manhole	1500	S17.005	22.674	300	S17.004
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Manhole Schedules for Storm

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)
SMH04-836 (P)	23.848	1.264	Open Manhole	1200	S17.006	22.584	300	S17.005	22.584	300
SMH PS O-P 1	24.296	1.456	Open Manhole	1500	S18.000	22.840	675			
SMH04-838 (P)	24.129	1.452	Open Manhole	1500	S18.001	22.677	225	S18.000	22.677	675
SMH04-835 (P)	23.917	1.455	Open Manhole	1200	S17.007	22.462	300	S17.006	22.462	300
								S18.001	22.537	225
SMH04-834 (P)	23.740	1.364	Open Manhole	1200	S17.008	22.376	300	S17.007	22.376	300
SMH P4.2 O-P 8	26.250	0.600	Junction		S19.000	25.650	2000			
SMH P4.2 O-P 7	25.900	0.600	Junction		S19.001	25.300	2000	S19.000	25.300	2000
SMH P4.2 O-P 6	25.712	0.600	Junction		S19.002	25.112	2000	S19.001	25.112	2000
SMH P4.2 O-P 5	25.473	0.600	Junction		S19.003	24.873	2000	S19.002	24.874	2000
SMH P4.2 O-P 4	24.865	0.600	Junction		S19.004	24.265	2000	S19.003	24.292	2000
SMH P4.2 O-P 3	24.837	0.616	Junction		S19.005	24.237	2000	S19.004	24.221	2000
SMH P4.2 O-P 2	24.658	0.600	Junction		S19.006	24.058	2000	S19.005	24.074	2000
SMH P4.2 O-P 1	24.151	1.256	Open Manhole	1200	S19.007	22.895	525	S19.006	23.551	2000
SMH04-840 (P)	23.920	1.482	Open Manhole	1500	S19.008	22.438	225	S19.007	22.438	525
SMH04-839 (P)	23.783	1.391	Open Manhole	1200	S19.009	22.392	225	S19.008	22.392	225
SMH04-833 (P)	23.698	1.560	Open Manhole	1200	S17.009	22.138	300	S17.008	22.239	300
								S19.009	22.314	225
SMH04-830	23.743	1.650	Open Manhole	1200	S17.010	22.093	300	S17.009	22.093	300
SP13 INLET 2	23.754	1.804	Open Manhole	1350	S17.011	21.950	450	S17.010	22.045	300
SP13 OUTLET	23.700	1.800	Open Manhole	1500	S1.022	21.900	375	S1.021	21.900	525
								S17.011	21.900	450
SMH04-802	23.673	1.873	Open Manhole	1200	S1.023	21.800	375	S1.022	21.800	375
SP12 INLET	23.400	1.700	Open Manhole	1500	S1.024	21.700	600	S1.023	21.700	375
SP12 OUTLET	23.400	1.800	Open Manhole	1500	S1.025	21.600	300	S1.024	21.600	600
S79	23.496	1.930	Open Manhole	1200	S1.026	21.566	300	S1.025	21.566	300
S80	23.711	3.561	Open Manhole	1200	S20.000	20.150	300			
S81	23.543	3.439	Open Manhole	1200	S20.001	20.104	300	S20.000	20.104	300
SMH04-801	23.429	3.628	Open Manhole	1200	S1.027	19.801	300	S1.026	21.527	300
								S20.001	19.935	300
S	20.440	0.888	Open Manhole	0		OUTFALL		S1.027	19.552	300

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SMH04-823	530484.462	120790.285	530484.462	120790.285	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SMH SR 0-P 1	530063.634	120878.789	530063.634	120878.789	Required	
SMH04-832 (P)	530065.293	120874.271	530065.293	120874.271	Required	
SMH04-806	530064.484	120872.622	530064.484	120872.622	Required	
SMH04-805	530049.537	120879.598	530049.537	120879.598	Required	
SMH P2.8aE 0-P 1	530000.055	120839.018	530000.055	120839.018	Required	
SMH04-831 (P)	529997.823	120846.689	529997.823	120846.689	Required	
SMH04-804	530000.512	120871.810	530000.512	120871.810	Required	
SMH04-803	529992.662	120880.569	529992.662	120880.569	Required	
SP13 INLET 1	529984.474	120889.701	529984.474	120889.701	Required	
SMH CNC/P2.5 0-P 5	530247.913	121016.523	530247.913	121016.523	Required	
SMH CNC/P2.5 0-P 4	530295.685	120941.388	530295.685	120941.388	Required	
SMH CNC/P2.5 0-P 3	530312.567	120909.277	530312.567	120909.277	Required	
SMH CNC/P2.5 0-P 2	530277.851	120895.086	530277.851	120895.086	Required	
SMH CNC/P2.5 0-P 1	530163.231	120867.796	530163.231	120867.796	Required	
SMH04-837 (P)	530100.259	120853.786	530100.259	120853.786	Required	
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Area Summary for Storm						
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.046	0.046	0.046
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.047	0.047	0.047
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.034	0.034	0.034
2.001	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.033	0.033	0.033
2.002	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.049	0.049	0.049
2.004	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.021	0.021	0.021
5.001	-	-	100	0.000	0.000	0.000
2.005	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.060	0.060	0.060
2.006	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.128	0.128	0.128
1.006	-	-	100	0.000	0.000	0.000
8.000	-	-	100	0.038	0.038	0.038
1.007	-	-	100	0.000	0.000	0.000
9.000	-	-	100	0.100	0.100	0.100
1.008	-	-	100	0.000	0.000	0.000
10.000	-	-	100	0.041	0.041	0.041
1.009	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.048	0.048	0.048
1.010	-	-	100	0.000	0.000	0.000
12.000	-	-	100	0.041	0.041	0.041
1.011	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
13.000	-	-	100	0.095	0.095	0.095
1.013	-	-	100	0.000	0.000	0.000
14.000	-	-	100	0.143	0.143	0.143
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.041	0.041	0.041
15.000	-	-	100	0.062	0.062	0.062
15.001	-	-	100	0.197	0.197	0.197
15.002	-	-	100	0.000	0.000	0.000
15.003	-	-	100	0.055	0.055	0.055
15.004	-	-	100	0.039	0.039	0.039
15.005	-	-	100	0.009	0.009	0.009
15.006	-	-	100	0.044	0.044	0.044
15.007	-	-	100	0.008	0.008	0.008
15.008	-	-	100	0.000	0.000	0.000
15.009	-	-	100	0.000	0.000	0.000
15.010	-	-	100	0.000	0.000	0.000
1.017	-	-	100	0.102	0.102	0.102
1.018	-	-	100	0.000	0.000	0.000
16.000	-	-	100	0.407	0.407	0.407
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
16.001	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
1.021	-	-	100	0.000	0.000	0.000
17.000	-	-	100	0.116	0.116	0.116
17.001	-	-	100	0.230	0.230	0.230
17.002	-	-	100	0.000	0.000	0.000
17.003	-	-	100	0.300	0.300	0.300
17.004	-	-	100	0.635	0.635	0.635
17.005	-	-	100	0.291	0.291	0.291
17.006	-	-	100	0.000	0.000	0.000
18.000	-	-	100	1.067	1.067	1.067
18.001	-	-	100	0.000	0.000	0.000
17.007	-	-	100	0.000	0.000	0.000
17.008	-	-	100	0.000	0.000	0.000
19.000	-	-	100	0.081	0.081	0.081
19.001	-	-	100	0.072	0.072	0.072
19.002	-	-	100	0.045	0.045	0.045
19.003	-	-	100	0.074	0.074	0.074
19.004	-	-	100	0.020	0.020	0.020
19.005	-	-	100	0.064	0.064	0.064
19.006	-	-	100	0.013	0.013	0.013
19.007	-	-	100	0.000	0.000	0.000
19.008	-	-	100	0.997	0.997	0.997
19.009	-	-	100	0.000	0.000	0.000
17.009	-	-	100	0.000	0.000	0.000
17.010	-	-	100	0.000	0.000	0.000
17.011	-	-	100	0.000	0.000	0.000
1.022	-	-	100	0.141	0.141	0.141
1.023	-	-	100	0.000	0.000	0.000
1.024	-	-	100	0.000	0.000	0.000
1.025	-	-	100	0.332	0.332	0.332
1.026	-	-	100	0.000	0.000	0.000
20.000	-	-	100	0.000	0.000	0.000
20.001	-	-	100	0.000	0.000	0.000
1.027	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				6.366	6.366	6.366

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
S1.027	S	20.440	19.552	0.000	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	5.000
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)	21600
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	24
Number of Input Hydrographs	0	Number of Storage Structures	19
Number of Online Controls	15	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 529200 120700 TQ 29200 20700
C (1km)	-0.027
D1 (1km)	0.383
D2 (1km)	0.289
D3 (1km)	0.420
E (1km)	0.316
F (1km)	2.478
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	10080

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SMH04-815, DS/PN: S1.008, Volume (m³): 33.7

Unit Reference	MD-SHE-0301-5500-1500-5500
Design Head (m)	1.500
Design Flow (l/s)	55.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	301
Invert Level (m)	23.943
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	55.0
Flush-Flo™	0.518	55.0
Kick-Flo®	1.081	47.0
Mean Flow over Head Range	-	46.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.2	1.200	49.4	3.000	76.9	7.000	116.2
0.200	30.9	1.400	53.2	3.500	82.9	7.500	120.1
0.300	52.3	1.600	56.7	4.000	88.4	8.000	124.0
0.400	54.4	1.800	60.0	4.500	93.6	8.500	127.7
0.500	55.0	2.000	63.2	5.000	98.6	9.000	131.3
0.600	54.8	2.200	66.2	5.500	103.3	9.500	134.8
0.800	53.4	2.400	69.0	6.000	107.7		
1.000	50.0	2.600	71.7	6.500	112.0		

Hydro-Brake® Optimum Manhole: SMH04-807, DS/PN: S1.016, Volume (m³): 19.2

Unit Reference	MD-SHE-0312-6000-1500-6000
Design Head (m)	1.500
Design Flow (l/s)	60.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	312
Invert Level (m)	22.653
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

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Hydro-Brake® Optimum Manhole: SMH04-807, DS/PN: S1.016, Volume (m³): 19.2

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	60.0
Flush-Flo™	0.528	59.7
Kick-Flo®	1.083	51.2
Mean Flow over Head Range	-	50.2

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)
0.100	9.4	1.200	53.8	3.000	83.9	7.000	126.7
0.200	32.0	1.400	58.0	3.500	90.4	7.500	131.1
0.300	55.5	1.600	61.9	4.000	96.5	8.000	135.3
0.400	58.9	1.800	65.5	4.500	102.2	8.500	139.3
0.500	59.7	2.000	68.9	5.000	107.5	9.000	143.3
0.600	59.6	2.200	72.2	5.500	112.7	9.500	147.1
0.800	58.1	2.400	75.3	6.000	117.5		
1.000	54.5	2.600	78.2	6.500	122.2		

Complex Manhole: SMH SR 0-P 8, DS/PN: S15.002, Volume (m³): 150.7

Orifice

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 24.846

Weir

Discharge Coef 0.544 Width (m) 5.500 Invert Level (m) 25.346

Complex Manhole: SMH SR 0-P 7, DS/PN: S15.003, Volume (m³): 152.1

Orifice

Diameter (m) 0.300 Discharge Coefficient 0.600 Invert Level (m) 24.179

Weir

Discharge Coef 0.544 Width (m) 5.500 Invert Level (m) 24.679

Complex Manhole: SMH SR 0-P 6, DS/PN: S15.004, Volume (m³): 84.7

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Midpoint
Alencon Link
Basingstoke, RG21 7PP

Date 20/11/2023
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Engineer

Designed by TA
Checked by Stephen McCann

Network 2020.1

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Orifice

Diameter (m) 0.375 Discharge Coefficient 0.600 Invert Level (m) 23.807

Weir

Discharge Coef 0.544 Width (m) 5.500 Invert Level (m) 24.307

Complex Manhole: SMH SR 0-P 5, DS/PN: S15.005, Volume (m³): 45.7

Orifice

Diameter (m) 0.375 Discharge Coefficient 0.600 Invert Level (m) 23.606

Weir

Discharge Coef 0.544 Width (m) 5.500 Invert Level (m) 24.106

Hydro-Brake® Optimum Manhole: SMH04-831 (P), DS/PN: S16.001, Volume (m³): 2.6

Unit Reference MD-SHE-0100-4800-1250-4800

Design Head (m) 1.250

Design Flow (l/s) 4.8

Flush-Flo™ Calculated

Objective Minimise upstream storage

Application Surface

Sump Available Yes

Diameter (mm) 100

Invert Level (m) 22.435

Minimum Outlet Pipe Diameter (mm) 150

Suggested Manhole Diameter (mm) 1200

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)

1.250

4.8

Flush-Flo™

0.370

4.8

Kick-Flo®

0.772

3.8

Mean Flow over Head Range

-

4.2

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)

0.100

3.3

0.600

4.6

1.600

5.4

2.600

6.8

0.200

4.5

0.800

3.9

1.800

5.7

3.000

7.2

0.300

4.8

1.000

4.3

2.000

6.0

3.500

7.8

0.400

4.8

1.200

4.7

2.200

6.2

4.000

8.3

0.500

4.7

1.400

5.1

2.400

6.5

4.500

8.7

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Midpoint Alencon Link Basingstoke, RG21 7PP		Engineer																																																																																																																																																						
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Hydro-Brake® Optimum Manhole: SMH04-831 (P), DS/PN: S16.001, Volume (m³): 2.6 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>5.000</td><td>9.2</td><td>6.500</td><td>10.4</td><td>8.000</td><td>11.5</td><td>9.500</td><td>12.5</td></tr><tr><td>5.500</td><td>9.6</td><td>7.000</td><td>10.8</td><td>8.500</td><td>11.8</td><td></td><td></td></tr><tr><td>6.000</td><td>10.0</td><td>7.500</td><td>11.2</td><td>9.000</td><td>12.2</td><td></td><td></td></tr></table> Hydro-Brake® Optimum Manhole: SMH04-837 (P), DS/PN: S17.005, Volume (m³): 20.6 <table><tr><td>Unit Reference</td><td>MD-SHE-0165-1400-1300-1400</td></tr><tr><td>Design Head (m)</td><td>1.300</td></tr><tr><td>Design Flow (l/s)</td><td>14.0</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>165</td></tr><tr><td>Invert Level (m)</td><td>22.674</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1500</td></tr></table> <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.300</td><td>14.0</td></tr><tr><td>Flush-Flo™</td><td>0.387</td><td>14.0</td></tr><tr><td>Kick-Flo®</td><td>0.850</td><td>11.5</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>12.1</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>5.9</td><td>1.200</td><td>13.5</td><td>3.000</td><td>20.8</td><td>7.000</td><td>31.3</td></tr><tr><td>0.200</td><td>13.0</td><td>1.400</td><td>14.5</td><td>3.500</td><td>22.4</td><td>7.500</td><td>32.4</td></tr><tr><td>0.300</td><td>13.8</td><td>1.600</td><td>15.4</td><td>4.000</td><td>23.9</td><td>8.000</td><td>33.4</td></tr><tr><td>0.400</td><td>14.0</td><td>1.800</td><td>16.3</td><td>4.500</td><td>25.3</td><td>8.500</td><td>34.4</td></tr><tr><td>0.500</td><td>13.8</td><td>2.000</td><td>17.2</td><td>5.000</td><td>26.6</td><td>9.000</td><td>35.3</td></tr><tr><td>0.600</td><td>13.6</td><td>2.200</td><td>18.0</td><td>5.500</td><td>27.9</td><td>9.500</td><td>36.3</td></tr><tr><td>0.800</td><td>12.2</td><td>2.400</td><td>18.7</td><td>6.000</td><td>29.1</td><td></td><td></td></tr><tr><td>1.000</td><td>12.4</td><td>2.600</td><td>19.5</td><td>6.500</td><td>30.2</td><td></td><td></td></tr></table> Hydro-Brake® Optimum Manhole: SMH04-838 (P), DS/PN: S18.001, Volume (m³): 7.5 <table><tr><td>Unit Reference</td><td>MD-SHE-0154-1200-1300-1200</td></tr><tr><td>Design Head (m)</td><td>1.300</td></tr><tr><td>Design Flow (l/s)</td><td>12.0</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr></table> ©1982-2020 Innovyze				Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	5.000	9.2	6.500	10.4	8.000	11.5	9.500	12.5	5.500	9.6	7.000	10.8	8.500	11.8			6.000	10.0	7.500	11.2	9.000	12.2			Unit Reference	MD-SHE-0165-1400-1300-1400	Design Head (m)	1.300	Design Flow (l/s)	14.0	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	165	Invert Level (m)	22.674	Minimum Outlet Pipe Diameter (mm)	225	Suggested Manhole Diameter (mm)	1500	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.300	14.0	Flush-Flo™	0.387	14.0	Kick-Flo®	0.850	11.5	Mean Flow over Head Range	-	12.1	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.9	1.200	13.5	3.000	20.8	7.000	31.3	0.200	13.0	1.400	14.5	3.500	22.4	7.500	32.4	0.300	13.8	1.600	15.4	4.000	23.9	8.000	33.4	0.400	14.0	1.800	16.3	4.500	25.3	8.500	34.4	0.500	13.8	2.000	17.2	5.000	26.6	9.000	35.3	0.600	13.6	2.200	18.0	5.500	27.9	9.500	36.3	0.800	12.2	2.400	18.7	6.000	29.1			1.000	12.4	2.600	19.5	6.500	30.2			Unit Reference	MD-SHE-0154-1200-1300-1200	Design Head (m)	1.300	Design Flow (l/s)	12.0	Flush-Flo™	Calculated
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																																																																																																	
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Innovyze	Network 2020.1																																																																																								
Hydro-Brake® Optimum Manhole: SMH04-838 (P), DS/PN: S18.001, Volume (m³): 7.5 Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 154 Invert Level (m) 22.677 Minimum Outlet Pipe Diameter (mm) 225 Suggested Manhole Diameter (mm) 1200 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.300</td><td>12.0</td></tr><tr><td>Flush-Flo™</td><td>0.389</td><td>12.0</td></tr><tr><td>Kick-Flo®</td><td>0.844</td><td>9.8</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>10.4</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>5.5</td><td>1.200</td><td>11.6</td><td>3.000</td><td>17.8</td><td>7.000</td><td>26.8</td></tr><tr><td>0.200</td><td>11.2</td><td>1.400</td><td>12.4</td><td>3.500</td><td>19.2</td><td>7.500</td><td>27.7</td></tr><tr><td>0.300</td><td>11.9</td><td>1.600</td><td>13.2</td><td>4.000</td><td>20.5</td><td>8.000</td><td>28.6</td></tr><tr><td>0.400</td><td>12.0</td><td>1.800</td><td>14.0</td><td>4.500</td><td>21.7</td><td>8.500</td><td>29.4</td></tr><tr><td>0.500</td><td>11.9</td><td>2.000</td><td>14.7</td><td>5.000</td><td>22.8</td><td>9.000</td><td>30.2</td></tr><tr><td>0.600</td><td>11.6</td><td>2.200</td><td>15.4</td><td>5.500</td><td>23.9</td><td>9.500</td><td>31.1</td></tr><tr><td>0.800</td><td>10.4</td><td>2.400</td><td>16.0</td><td>6.000</td><td>24.9</td><td></td><td></td></tr><tr><td>1.000</td><td>10.6</td><td>2.600</td><td>16.7</td><td>6.500</td><td>25.9</td><td></td><td></td></tr></table> Orifice Manhole: SMH P4.2 O-P 7, DS/PN: S19.001, Volume (m³): 130.3 Diameter (m) 0.120 Discharge Coefficient 0.600 Invert Level (m) 25.300 Orifice Manhole: SMH P4.2 O-P 5, DS/PN: S19.003, Volume (m³): 88.4 Diameter (m) 0.125 Discharge Coefficient 0.600 Invert Level (m) 24.873 Orifice Manhole: SMH P4.2 O-P 2, DS/PN: S19.006, Volume (m³): 60.7 Diameter (m) 0.160 Discharge Coefficient 0.600 Invert Level (m) 24.058 Hydro-Brake® Optimum Manhole: SMH04-840 (P), DS/PN: S19.008, Volume (m³): 12.2 Unit Reference MD-SHE-0165-1420-1420-1420 Design Head (m) 1.420 Design Flow (l/s) 14.2 Flush-Flo™ Calculated			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.300	12.0	Flush-Flo™	0.389	12.0	Kick-Flo®	0.844	9.8	Mean Flow over Head Range	-	10.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.5	1.200	11.6	3.000	17.8	7.000	26.8	0.200	11.2	1.400	12.4	3.500	19.2	7.500	27.7	0.300	11.9	1.600	13.2	4.000	20.5	8.000	28.6	0.400	12.0	1.800	14.0	4.500	21.7	8.500	29.4	0.500	11.9	2.000	14.7	5.000	22.8	9.000	30.2	0.600	11.6	2.200	15.4	5.500	23.9	9.500	31.1	0.800	10.4	2.400	16.0	6.000	24.9			1.000	10.6	2.600	16.7	6.500	25.9		
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Midpoint
Alencon Link
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Innovyze

Engineer

Designed by TA
Checked by Stephen McCann

Network 2020.1

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Hydro-Brake® Optimum Manhole: SMH04-840 (P), DS/PN: S19.008, Volume (m³):
12.2

Objective Minimise upstream storage

ApplicationSurface

Sump AvailableYes

Diameter (mm)165

Invert Level (m)22.438

Minimum Outlet Pipe Diameter (mm)225

Suggested Manhole Diameter (mm)1500

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)1.42014.2

Flush-Flo™0.42214.2

Kick-Flo®0.91411.5

Mean Flow over Head Range-12.3

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

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

0.1005.9

1.20013.1

3.00020.3

7.00030.4

0.20012.9

1.40014.1

3.50021.8

7.50031.5

0.30013.9

1.60015.0

4.00023.3

8.00032.5

0.40014.2

1.80015.9

4.50024.6

8.50033.4

0.50014.1

2.00016.7

5.00025.9

9.00034.4

0.60013.9

2.20017.5

5.50027.1

9.50035.3

0.80012.9

2.40018.2

6.00028.3

1.00012.0

2.60018.9

6.50029.4

Complex Manhole: SMH04-802, DS/PN: S1.023, Volume (m³): 3.3

Orifice

Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 21.800

Weir

Discharge Coef 0.544 Width (m) 1.200 Invert Level (m) 22.090

Hydro-Brake® Optimum Manhole: SP12 OUTLET, DS/PN: S1.025, Volume (m³): 13.0

Unit Reference MD-SHE-0283-5000-1900-5000

Design Head (m)1.900

Design Flow (l/s)50.0

Flush-Flo™Calculated

Objective Minimise upstream storage

ApplicationSurface

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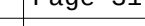
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Midpoint Alencon Link Basingstoke, RG21 7PP	Engineer																																																																									
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Hydro-Brake® Optimum Manhole: SP12 OUTLET, DS/PN: S1.025, Volume (m³): 13.0																																																																										
Sump AvailableYes Diameter (mm)283 Invert Level (m)21.600 Minimum Outlet Pipe Diameter (mm)300 Suggested Manhole Diameter (mm)2100																																																																										
<table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.900</td><td>50.0</td></tr><tr><td>Flush-Flo™</td><td>0.585</td><td>50.0</td></tr><tr><td>Kick-Flo®</td><td>1.279</td><td>41.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>42.9</td></tr></table>			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.900	50.0	Flush-Flo™	0.585	50.0	Kick-Flo®	1.279	41.3	Mean Flow over Head Range	-	42.9																																																									
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Kick-Flo®	1.279	41.3																																																																								
Mean Flow over Head Range	-	42.9																																																																								
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																																																																										
<table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>8.8</td><td>1.200</td><td>44.1</td><td>3.000</td><td>62.3</td><td>7.000</td><td>94.0</td></tr><tr><td>0.200</td><td>29.1</td><td>1.400</td><td>43.1</td><td>3.500</td><td>67.1</td><td>7.500</td><td>97.2</td></tr><tr><td>0.300</td><td>46.5</td><td>1.600</td><td>46.0</td><td>4.000</td><td>71.6</td><td>8.000</td><td>100.3</td></tr><tr><td>0.400</td><td>48.8</td><td>1.800</td><td>48.7</td><td>4.500</td><td>75.8</td><td>8.500</td><td>103.3</td></tr><tr><td>0.500</td><td>49.8</td><td>2.000</td><td>51.2</td><td>5.000</td><td>79.8</td><td>9.000</td><td>106.2</td></tr><tr><td>0.600</td><td>50.0</td><td>2.200</td><td>53.6</td><td>5.500</td><td>83.6</td><td>9.500</td><td>109.1</td></tr><tr><td>0.800</td><td>49.2</td><td>2.400</td><td>55.9</td><td>6.000</td><td>87.2</td><td></td><td></td></tr><tr><td>1.000</td><td>47.7</td><td>2.600</td><td>58.1</td><td>6.500</td><td>90.7</td><td></td><td></td></tr></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	8.8	1.200	44.1	3.000	62.3	7.000	94.0	0.200	29.1	1.400	43.1	3.500	67.1	7.500	97.2	0.300	46.5	1.600	46.0	4.000	71.6	8.000	100.3	0.400	48.8	1.800	48.7	4.500	75.8	8.500	103.3	0.500	49.8	2.000	51.2	5.000	79.8	9.000	106.2	0.600	50.0	2.200	53.6	5.500	83.6	9.500	109.1	0.800	49.2	2.400	55.9	6.000	87.2			1.000	47.7	2.600	58.1	6.500	90.7		
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																			
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Innovyze	Network 2020.1																																																	
Storage Structures for Storm Bio-Retention Area Manhole: S6, DS/PN: S2.000 Invert Level (m) 25.923 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.30 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>111.0</td><td>87.000</td><td>1.000</td><td>111.0</td><td>87.000</td></tr></table> Bio-Retention Area Manhole: S7, DS/PN: S3.000 Invert Level (m) 26.150 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.30 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>115.0</td><td>89.000</td><td>1.000</td><td>115.0</td><td>89.000</td></tr></table> Bio-Retention Area Manhole: S9, DS/PN: S4.000 Invert Level (m) 26.927 Porosity 0.30 Infiltration Coefficient Base (m/hr) 26.92700 Infiltration Coefficient Side (m/hr) 0.00000 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>136.0</td><td>105.000</td><td>1.000</td><td>136.0</td><td>105.000</td></tr></table> Bio-Retention Area Manhole: S13, DS/PN: S6.000 Invert Level (m) 26.890 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.30 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>141.0</td><td>108.000</td><td>1.000</td><td>141.0</td><td>108.000</td></tr></table> Bio-Retention Area Manhole: S10, DS/PN: S7.000 Invert Level (m) 26.456 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.30 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	111.0	87.000	1.000	111.0	87.000	Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	115.0	89.000	1.000	115.0	89.000	Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	136.0	105.000	1.000	136.0	105.000	Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	141.0	108.000	1.000	141.0	108.000
Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)																																													
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<u>Bio-Retention Area Manhole: S10, DS/PN: S7.000</u> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>128.0</td><td>98.000</td><td>1.000</td><td>128.0</td><td>98.000</td></tr></table> <u>Bio-Retention Area Manhole: S12, DS/PN: S8.000</u> <table><tr><td>Invert Level (m)</td><td>25.896</td><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td></tr><tr><td>Porosity</td><td>0.30</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>102.0</td><td>81.000</td><td>1.000</td><td>102.0</td><td>81.000</td></tr></table> <u>Bio-Retention Area Manhole: S20, DS/PN: S9.000</u> <table><tr><td>Invert Level (m)</td><td>25.557</td><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td></tr><tr><td>Porosity</td><td>0.30</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>191.0</td><td>133.000</td><td>1.000</td><td>191.0</td><td>133.000</td></tr></table> <u>Bio-Retention Area Manhole: S15, DS/PN: S10.000</u> <table><tr><td>Invert Level (m)</td><td>25.071</td><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td></tr><tr><td>Porosity</td><td>0.30</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>114.0</td><td>91.000</td><td>1.000</td><td>114.0</td><td>91.000</td></tr></table> <u>Bio-Retention Area Manhole: S23, DS/PN: S11.000</u> <table><tr><td>Invert Level (m)</td><td>24.719</td><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td></tr><tr><td>Porosity</td><td>0.30</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th><th>Depth (m)</th><th>Area (m²)</th><th>Perimeter (m)</th></tr><tr><td>0.000</td><td>157.0</td><td>111.000</td><td>1.000</td><td>157.0</td><td>111.000</td></tr></table> <u>Bio-Retention Area Manhole: S18, DS/PN: S12.000</u> <table><tr><td>Invert Level (m)</td><td>24.435</td><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td></tr><tr><td>Porosity</td><td>0.30</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	128.0	98.000	1.000	128.0	98.000	Invert Level (m)	25.896	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.30	Safety Factor	2.0	Infiltration Coefficient Base (m/hr)	0.00000			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	102.0	81.000	1.000	102.0	81.000	Invert Level (m)	25.557	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.30	Safety Factor	2.0	Infiltration Coefficient Base (m/hr)	0.00000			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	191.0	133.000	1.000	191.0	133.000	Invert Level (m)	25.071	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.30	Safety Factor	2.0	Infiltration Coefficient Base (m/hr)	0.00000			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	114.0	91.000	1.000	114.0	91.000	Invert Level (m)	24.719	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.30	Safety Factor	2.0	Infiltration Coefficient Base (m/hr)	0.00000			Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)	0.000	157.0	111.000	1.000	157.0	111.000	Invert Level (m)	24.435	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.30	Safety Factor	2.0	Infiltration Coefficient Base (m/hr)	0.00000		
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Depth (m)	Area (m²)	Perimeter (m)	Depth (m)	Area (m²)	Perimeter (m)																																																																																													
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Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																													
0.000	420.0	1.000	420.0	1.001	0.0																																																																																													
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																													
0.000	50.0	1.125	50.0	1.126	0.0																																																																																													
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																													
0.000	1770.0	1.000	1770.0	1.001	0.0																																																																																													
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<u>Tank or Pond Manhole: SMH04-838 (P), DS/PN: S18.001</u> Invert Level (m) 22.677 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>900.0</td><td>1.132</td><td>900.0</td><td>1.133</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: SMH04-840 (P), DS/PN: S19.008</u> Invert Level (m) 22.438 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1150.0</td><td>1.331</td><td>1150.0</td><td>1.332</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: SP13 OUTLET, DS/PN: S1.022</u> Invert Level (m) 21.900 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>35.0</td><td>1.300</td><td>399.0</td></tr></table> <u>Tank or Pond Manhole: SP12 OUTLET, DS/PN: S1.025</u> Invert Level (m) 21.600 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>952.0</td><td>1.500</td><td>2042.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	900.0	1.132	900.0	1.133	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1150.0	1.331	1150.0	1.332	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	35.0	1.300	399.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	952.0	1.500	2042.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																					
0.000	900.0	1.132	900.0	1.133	0.0																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																					
0.000	1150.0	1.331	1150.0	1.332	0.0																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)																																							
0.000	35.0	1.300	399.0																																							
Depth (m)	Area (m²)	Depth (m)	Area (m²)																																							
0.000	952.0	1.500	2042.0																																							
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	19
Number of Online Controls	15	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model				FEH
FEH Rainfall Version				1999
Site	Location	GB 529200	120700 TQ 29200	20700
	C (1km)			-0.027
	D1 (1km)			0.383
	D2 (1km)			0.289
	D3 (1km)			0.420
	E (1km)			0.316
	F (1km)			2.478
	Cv (Summer)			1.000
	Cv (Winter)			1.000

```
Margin for Flood Risk Warning (mm) 300.0      DVD Status  ON
      Analysis Timestep  Fine Inertia Status OFF
      DTS Status  OFF
```

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.
S1.000	SMH04-823	15	Summer	100	+40%	100/15	Summer	
S1.001	SMH04-822	15	Summer	100	+40%	100/15	Summer	
S1.002	SMH04-821	15	Summer	100	+40%	30/15	Summer	
S1.003	SMH04-820	15	Summer	100	+40%			
S1.004	SMH04-819	60	Summer	100	+40%			
S2.000	S6	15	Summer	100	+40%			
S2.001	S6	15	Summer	100	+40%			
S3.000	S7	15	Summer	100	+40%	30/15	Summer	
S2.002	S6	15	Summer	100	+40%			
S2.003	S6	15	Summer	100	+40%			
S4.000	S9	15	Summer	100	+40%			
S2.004	SMH04-827	15	Summer	100	+40%			

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH04-823	28.342	0.647	0.000	1.37		44.4	SURCHARGED
S1.001	SMH04-822	28.076	0.517	0.000	1.03		46.4	SURCHARGED
S1.002	SMH04-821	27.795	0.573	0.000	2.07		84.0	SURCHARGED
S1.003	SMH04-820	26.982	-0.071	0.000	0.80		83.3	OK
S1.004	SMH04-819	25.522	-0.395	0.000	0.04		56.3	OK
S2.000	S6	26.083	-0.140	0.000	0.55	7	33.6	OK
S2.001	S6	26.049	-0.139	0.000	0.54		32.3	OK
S3.000	S7	26.431	0.181	0.000	2.24	12	13.4	SURCHARGED
S2.002	S6	25.949	-0.100	0.000	0.76		44.3	OK
S2.003	S6	25.858	-0.088	0.000	0.84		43.5	OK
S4.000	S9	26.933	-0.094	0.000	0.01	4	0.1	OK
S2.004	SMH04-827	25.802	-0.103	0.000	0.76		43.0	OK

PN	US/MH Name	Level Exceeded
S1.000	SMH04-823	
S1.001	SMH04-822	
S1.002	SMH04-821	
S1.003	SMH04-820	
S1.004	SMH04-819	
S2.000	S6	
S2.001	S6	
S3.000	S7	
S2.002	S6	
S2.003	S6	
S4.000	S9	
S2.004	SMH04-827	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm								
PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S5.000	SMH04-829		28.059	-0.066	0.000	0.81		
S5.001	SMH04-828		27.781	-0.144	0.000	0.28		
S2.005	SMH04-826		25.655	-0.173	0.000	0.51		
S6.000	S13		27.365	0.375	0.000	3.10		20
S2.006	S10		25.588	-0.113	0.000	0.83		
S1.005	SMH04-818		25.523	-0.148	0.000	0.05		
S7.000	S10		27.719	1.163	0.000	3.13		
S1.006	SMH04-817		25.514	0.000	0.000	0.05		
S8.000	S12		26.281	0.285	0.000	2.16		14
S1.007	SMH04-816		25.423	0.123	0.000	0.03		
S9.000	S20		26.209	0.552	0.000	3.78		28
S1.008	SMH04-815		25.422	0.879	0.000	0.13		
S10.000	S15		25.447	0.276	0.000	2.46		14
S1.009	SMH04-814		24.647	0.279	0.000	0.05		
S11.000	S23		25.063	0.244	0.000	2.68		20
S1.010	SMH04-813		24.579	0.298	0.000	0.06		
S12.000	S18		25.119	0.584	0.000	2.92		12
S1.011	SMH04-812		24.562	0.365	0.000	0.06		
S1.012	SMH04-811		24.562	0.468	0.000	0.06		
S13.000	S20		24.553	0.889	0.000	3.87		26
S1.013	SMH04-810		24.567	0.597	0.000	0.06		
S14.000	S29		24.327	0.669	0.000	3.67		57
S1.014	SMH04-809		24.569	0.704	0.000	0.07		
S1.015	SMH04-808		24.569	0.816	0.000	0.07		
S1.016	SMH04-807		24.567	1.464	0.000	0.35		
S15.000	SMH SR 0-P 10		26.133	0.101	0.000	1.08		
S15.001	SMH SR 0-P 9		25.842	-0.271	0.000	0.27		
S15.002	SMH SR 0-P 8		25.420	-0.026	0.000	0.19		
S15.003	SMH SR 0-P 7		24.715	-0.064	0.000	0.11		
S15.004	SMH SR 0-P 6		24.337	-0.070	0.000	0.07		
S15.005	SMH SR 0-P 5		24.091	-0.125	0.000	0.06		
S15.006	SMH SR 0-P 4		23.880	-0.167	0.000	0.06		
S15.007	SMH SR 0-P 3		23.871	-0.067	0.000	0.07		
S15.008	SMH SR 0-P 2		23.854	0.823	0.000	2.16		
S15.009	SMH SR 0-P 1		23.553	0.615	0.000	1.98		
S15.010	SMH04-832 (P)		23.496	0.597	0.000	1.62		
S1.017	SMH04-806		23.492	0.605	0.000	0.45		
S1.018	SMH04-805		23.420	0.683	0.000	0.53		
S16.000	SMH P2.8aE 0-P 1		23.515	0.583	0.000	2.79		
S16.001	SMH04-831 (P)		23.432	0.772	0.000	0.14		
S1.019	SMH04-804		23.346	0.770	0.000	0.75		
S1.020	SMH04-803		23.340	0.804	0.000	0.75		
S1.021	SP13 INLET 1		23.334	0.864	0.000	0.46		
S17.000	SMH CNC/P2.5 0-P 5		26.068	0.753	0.000	1.37		
S17.001	SMH CNC/P2.5 0-P 4		26.510	1.640	0.000	1.08		
S17.002	SMH CNC/P2.5 0-P 3		26.390	1.701	0.000	0.97		
S17.003	SMH CNC/P2.5 0-P 2		26.251	1.750	0.000	1.23		
S17.004	SMH CNC/P2.5 0-P 1		24.926	1.218	0.000	1.92		
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>				
PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S1.021	SP13 INLET 1	102.2	SURCHARGED	
S17.000	SMH CNC/P2.5 O-P 5	103.4	SURCHARGED	
S17.001	SMH CNC/P2.5 O-P 4	216.2	SURCHARGED	
S17.002	SMH CNC/P2.5 O-P 3	194.8	SURCHARGED	
S17.003	SMH CNC/P2.5 O-P 2	465.4	SURCHARGED	
S17.004	SMH CNC/P2.5 O-P 1	972.8	FLOOD RISK	
S17.005	SMH04-837 (P)	13.1	SURCHARGED	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S17.006	SMH04-836 (P)	720 Summer	100	+40%	30/180 Summer		
S18.000	SMH PS 0-P 1	15 Summer	100	+40%	100/15 Summer		
S18.001	SMH04-838 (P)	720 Winter	100	+40%	30/15 Summer		
S17.007	SMH04-835 (P)	720 Summer	100	+40%	30/60 Summer		
S17.008	SMH04-834 (P)	720 Summer	100	+40%	30/30 Summer		
S19.000	SMH P4.2 0-P 8	15 Summer	100	+40%			
S19.001	SMH P4.2 0-P 7	30 Winter	100	+40%			
S19.002	SMH P4.2 0-P 6	120 Winter	100	+40%			
S19.003	SMH P4.2 0-P 5	120 Winter	100	+40%			
S19.004	SMH P4.2 0-P 4	60 Summer	100	+40%			
S19.005	SMH P4.2 0-P 3	60 Summer	100	+40%			
S19.006	SMH P4.2 0-P 2	60 Summer	100	+40%			
S19.007	SMH P4.2 0-P 1	720 Winter	100	+40%	100/240 Summer		
S19.008	SMH04-840 (P)	720 Winter	100	+40%	1/600 Summer		
S19.009	SMH04-839 (P)	720 Winter	100	+40%	30/30 Summer		
S17.009	SMH04-833 (P)	720 Summer	100	+40%	1/120 Summer		
S17.010	SMH04-830	720 Summer	100	+40%	1/60 Summer		
S17.011	SP13 INLET 2	720 Summer	100	+40%	1/480 Summer		
S1.022	SP13 OUTLET	720 Summer	100	+40%	1/30 Summer		
S1.023	SMH04-802	720 Summer	100	+40%	1/15 Summer		
S1.024	SP12 INLET	720 Summer	100	+40%	30/480 Summer		
S1.025	SP12 OUTLET	720 Summer	100	+40%	1/180 Summer		
S1.026	S79	240 Winter	100	+40%			
S20.000	S80	15 Summer	1	+0%			
S20.001	S81	15 Summer	1	+0%			
S1.027	SMH04-801	8640 Summer	100	+40%			

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S17.006	SMH04-836 (P)		23.531	0.647	0.000	0.21		
S18.000	SMH PS 0-P 1		24.191	0.676	0.000	2.30		
S18.001	SMH04-838 (P)		23.802	0.900	0.000	0.36		
S17.007	SMH04-835 (P)		23.521	0.759	0.000	0.39		
S17.008	SMH04-834 (P)		23.498	0.822	0.000	0.37		
S19.000	SMH P4.2 0-P 8		25.845	-0.405	0.000	0.11		
S19.001	SMH P4.2 0-P 7		25.822	-0.078	0.000	0.02		
S19.002	SMH P4.2 0-P 6		25.423	-0.289	0.000	0.03		
S19.003	SMH P4.2 0-P 5		25.414	-0.059	0.000	0.02		
S19.004	SMH P4.2 0-P 4		24.533	-0.332	0.000	0.03		
S19.005	SMH P4.2 0-P 3		24.531	-0.306	0.000	0.08		
S19.006	SMH P4.2 0-P 2		24.521	-0.137	0.000	0.02		
S19.007	SMH P4.2 0-P 1		23.697	0.277	0.000	0.06		
S19.008	SMH04-840 (P)		23.695	1.032	0.000	0.44		
S19.009	SMH04-839 (P)		23.497	0.880	0.000	0.47		
S17.009	SMH04-833 (P)		23.471	1.033	0.000	0.66		
S17.010	SMH04-830		23.408	1.015	0.000	0.65		

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S17.011	SP13 INLET 2		23.340	0.940	0.000	0.24		
S1.022	SP13 OUTLET	0	23.331	1.056	0.000	1.04	0.0	
S1.023	SMH04-802		23.205	1.030	0.000	1.04		
S1.024	SP12 INLET		22.892	0.592	0.000	0.43		
S1.025	SP12 OUTLET	0	22.880	0.980	0.000	0.91	0.0	
S1.026	S79		21.772	-0.094	0.000	0.81		
S20.000	S80		20.150	-0.300	0.000	0.00		
S20.001	S81		20.104	-0.300	0.000	0.00		
S1.027	SMH04-801		19.997	-0.104	0.000	0.76		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S17.006	SMH04-836 (P)	12.6	SURCHARGED	
S18.000	SMH PS 0-P 1	1179.4	FLOOD RISK	
S18.001	SMH04-838 (P)	11.8	SURCHARGED	
S17.007	SMH04-835 (P)	22.1	SURCHARGED	
S17.008	SMH04-834 (P)	22.0	FLOOD RISK	
S19.000	SMH P4.2 0-P 8	85.8	OK	
S19.001	SMH P4.2 0-P 7	18.8	FLOOD RISK*	
S19.002	SMH P4.2 0-P 6	21.0	FLOOD RISK*	
S19.003	SMH P4.2 0-P 5	22.6	FLOOD RISK*	
S19.004	SMH P4.2 0-P 4	25.2	OK	
S19.005	SMH P4.2 0-P 3	58.6	OK	
S19.006	SMH P4.2 0-P 2	33.1	FLOOD RISK*	
S19.007	SMH P4.2 0-P 1	24.4	SURCHARGED	
S19.008	SMH04-840 (P)	13.3	FLOOD RISK	
S19.009	SMH04-839 (P)	13.3	FLOOD RISK	
S17.009	SMH04-833 (P)	34.8	FLOOD RISK	
S17.010	SMH04-830	34.7	SURCHARGED	
S17.011	SP13 INLET 2	34.7	SURCHARGED	
S1.022	SP13 OUTLET	128.7	SURCHARGED	
S1.023	SMH04-802	128.7	SURCHARGED	
S1.024	SP12 INLET	128.7	SURCHARGED	
S1.025	SP12 OUTLET	50.0	SURCHARGED	
S1.026	S79	50.0	OK	
S20.000	S80	0.0	OK	
S20.001	S81	0.0	OK	
S1.027	SMH04-801	50.0	OK	