

ARP Associates		Page 0
Northwest House	425-87-V3 - Network 1	
Servia Hill	1:1, 1;30yr Results	
Leeds LS6 2QH	Gypsy Lane, Wombwell	
Date 08/07/2022	Designed by JMG	
File V3 - NW1.MDX	Checked by MI	
Elstree Computing Ltd	Network 2018.1	

Time Area Diagram for Storm Network 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.711	4-8	1.517	8-12	0.009

Total Area Contributing (ha) = 2.237

Total Pipe Volume (m³) = 140.824

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Existing Network Details for Storm Network 1

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
1.000	35.369	0.951	37.2	0.107	4.00	0.0	0.600	o	225	Pipe/Conduit
1.001	13.772	0.898	15.3	0.067	4.00	0.0	0.600	o	225	Pipe/Conduit
1.002	12.241	0.321	38.1	0.076	4.00	0.0	0.600	o	300	Pipe/Conduit
1.003	28.134	0.326	86.3	0.035	4.00	0.0	0.600	o	300	Pipe/Conduit
1.004	21.271	0.528	40.3	0.071	4.00	0.0	0.600	o	375	Pipe/Conduit
2.000	12.735	0.400	31.8	0.102	4.00	0.0	0.600	o	150	Pipe/Conduit
1.005	16.475	0.190	86.7	0.019	4.00	0.0	0.600	o	375	Pipe/Conduit
1.006	29.890	1.079	27.7	0.016	4.00	0.0	0.600	o	375	Pipe/Conduit
1.007	29.944	0.400	74.9	0.191	4.00	0.0	0.600	o	525	Pipe/Conduit
1.008	11.755	0.222	53.0	0.063	4.00	0.0	0.600	o	525	Pipe/Conduit
1.009	33.363	0.456	73.2	0.079	4.00	0.0	0.600	o	525	Pipe/Conduit
3.000	21.046	0.872	24.1	0.114	4.00	0.0	0.600	o	225	Pipe/Conduit
4.000	15.956	0.324	49.2	0.039	4.00	0.0	0.600	o	225	Pipe/Conduit
3.001	11.190	0.115	97.3	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit
3.002	26.367	0.256	103.0	0.026	4.00	0.0	0.600	o	225	Pipe/Conduit
3.003	47.363	1.328	35.7	0.114	4.00	0.0	0.600	o	300	Pipe/Conduit
3.004	29.811	2.244	13.3	0.069	4.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	71.199	0.107	0.0	2.15	85.6
1.001	70.248	0.174	0.0	3.36	133.5
1.002	69.275	0.250	0.0	2.55	180.5
1.003	68.954	0.285	0.0	1.69	119.7
1.004	68.553	0.356	0.0	2.86	316.1
2.000	68.650	0.102	0.0	1.79	31.6
1.005	68.025	0.477	0.0	1.95	215.0
1.006	67.835	0.493	0.0	3.45	381.5
1.007	66.606	0.684	0.0	2.59	560.9
1.008	66.206	0.747	0.0	3.08	667.4
1.009	65.984	0.826	0.0	2.62	567.4
3.000	70.643	0.114	0.0	2.67	106.3
4.000	70.095	0.039	0.0	1.87	74.3
3.001	69.771	0.153	0.0	1.33	52.7
3.002	69.656	0.179	0.0	1.29	51.2
3.003	69.325	0.293	0.0	2.64	186.7
3.004	67.997	0.362	0.0	4.34	306.5

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Existing Network Details for Storm Network 1

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
1.010	55.166	0.333	165.7	0.087	4.00	0.0	0.600	o	525	Pipe/Conduit
1.011	13.017	0.087	149.6	0.073	4.00	0.0	0.600	o	525	Pipe/Conduit
1.012	15.743	0.105	149.9	0.119	4.00	0.0	0.600	o	525	Pipe/Conduit
1.013	30.649	0.204	150.2	0.085	4.00	0.0	0.600	o	525	Pipe/Conduit
1.014	49.134	2.456	20.0	0.117	4.00	0.0	0.600	o	525	Pipe/Conduit
1.015	38.502	2.298	16.8	0.111	4.00	0.0	0.600	o	525	Pipe/Conduit
1.016	15.328	0.578	26.5	0.061	4.00	0.0	0.600	o	525	Pipe/Conduit
5.000	25.959	0.324	80.1	0.020	4.00	0.0	0.600	o	150	Pipe/Conduit
1.017	11.156	0.981	11.4	0.034	4.00	0.0	0.600	o	600	Pipe/Conduit
1.018	16.879	0.042	401.9	0.000	4.00	0.0	0.600	o	600	Pipe/Conduit
6.000	20.594	0.124	166.1	0.087	4.00	0.0	0.600	o	300	Pipe/Conduit
6.001	14.806	0.089	166.4	0.066	4.00	0.0	0.600	o	300	Pipe/Conduit
7.000	18.608	0.874	21.3	0.102	4.00	0.0	0.600	o	225	Pipe/Conduit
6.002	20.039	0.137	146.3	0.027	4.00	0.0	0.600	o	300	Pipe/Conduit
6.003	26.484	0.057	464.6	0.000	4.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.010	65.528	1.275	0.0	1.74	376.1
1.011	65.195	1.348	0.0	1.83	395.9
1.012	65.108	1.467	0.0	1.83	395.5
1.013	65.003	1.552	0.0	1.83	395.1
1.014	64.799	1.669	0.0	5.02	1087.6
1.015	62.343	1.780	0.0	5.49	1188.7
1.016	60.045	1.841	0.0	4.36	944.3
5.000	60.166	0.020	0.0	1.12	19.9
1.017	59.392	1.895	0.0	7.25	2049.2
1.018	58.411	1.895	0.0	1.21	341.7
6.000	59.076	0.087	0.0	1.22	86.0
6.001	58.952	0.153	0.0	1.22	86.0
7.000	59.811	0.102	0.0	2.85	113.3
6.002	58.863	0.282	0.0	1.30	91.7
6.003	58.726	0.282	0.0	0.72	51.1

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Existing Network Details for Storm Network 1

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
1.019	14.108	0.028	503.9	0.000	4.00	0.0	0.600	o	600	Pipe/Conduit
1.020	4.002	0.012	333.5	0.000	4.00	0.0	0.600	o	900	Pipe/Conduit
1.021	21.949	0.049	447.9	0.020	4.00	0.0	0.600	o	900	Pipe/Conduit
1.022	32.942	0.073	451.3	0.040	4.00	0.0	0.600	o	900	Pipe/Conduit
1.023	10.734	0.107	100.3	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.019	58.369	2.177	0.0	1.08	304.8
1.020	58.041	2.177	0.0	1.71	1087.9
1.021	58.029	2.197	0.0	1.47	937.6
1.022	57.980	2.237	0.0	1.47	934.2
1.023	57.857	2.237	0.0	1.00	17.7

ARP Associates

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Network 2018.1

Micro Drainage

Manhole Schedules for Storm Network 1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)
1	72.624	1.425	Open Manhole	1200	1.000	71.199	225			
2	71.673	1.425	Open Manhole	1200	1.001	70.248	225	1.000	70.248	225
3	71.276	2.001	Open Manhole	1200	1.002	69.275	300	1.001	69.350	225
4	70.948	1.994	Open Manhole	1200	1.003	68.954	300	1.002	68.954	300
5	70.561	2.008	Open Manhole	1200	1.004	68.553	375	1.003	68.628	300
6	70.674	2.024	Open Manhole	1200	2.000	68.650	150			
7	70.300	2.275	Open Manhole	1500	1.005	68.025	375	1.004	68.025	375
								2.000	68.250	150
8	69.777	1.942	Open Manhole	1500	1.006	67.835	375	1.005	67.835	375
9	68.852	2.246	Open Manhole	1800	1.007	66.606	525	1.006	66.756	375
10	68.357	2.151	Open Manhole	1500	1.008	66.206	525	1.007	66.206	525
11	68.513	2.529	Open Manhole	1500	1.009	65.984	525	1.008	65.984	525
12	72.068	1.425	Open Manhole	1200	3.000	70.643	225			
13	71.520	1.425	Open Manhole	1500	4.000	70.095	225			
14	71.747	1.976	Open Manhole	1500	3.001	69.771	225	3.000	69.771	225
								4.000	69.771	225
15	71.761	2.105	Open Manhole	1500	3.002	69.656	225	3.001	69.656	225
16	71.352	2.027	Open Manhole	1500	3.003	69.325	300	3.002	69.400	225
17	70.338	2.341	Open Manhole	1500	3.004	67.997	300	3.003	67.997	300
18	69.030	3.502	Open Manhole	1800	1.010	65.528	525	1.009	65.528	525
								3.004	65.753	300
19	67.977	2.782	Open Manhole	1500	1.011	65.195	525	1.010	65.195	525
20	67.712	2.604	Open Manhole	1800	1.012	65.108	525	1.011	65.108	525
21	67.390	2.387	Open Manhole	1500	1.013	65.003	525	1.012	65.003	525
22	66.826	2.027	Open Manhole	1500	1.014	64.799	525	1.013	64.799	525
23	64.068	1.725	Open Manhole	1500	1.015	62.343	525	1.014	62.343	525
24	62.218	2.173	Open Manhole	1500	1.016	60.045	525	1.015	60.045	525
25	61.516	1.350	Open Manhole	1200	5.000	60.166	150			
26	61.650	2.258	Open Manhole	1500	1.017	59.392	600	1.016	59.467	525
								5.000	59.842	150
27	61.500	3.089	Open Manhole	1500	1.018	58.411	600	1.017	58.411	600
28	60.576	1.500	Open Manhole	1500	6.000	59.076	300			
29	60.820	1.868	Open Manhole	1500	6.001	58.952	300	6.000	58.952	300
30	61.236	1.425	Open Manhole	1500	7.000	59.811	225			
31	60.997	2.134	Open Manhole	1500	6.002	58.863	300	6.001	58.863	300
								7.000	58.937	225
32	61.000	2.274	Open Manhole	1500	6.003	58.726	300	6.002	58.726	300
27.1	61.500	3.131	Open Manhole	1500	1.019	58.369	600	1.018	58.369	600

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Manhole Schedules for Storm Network 1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
33	61.000	2.959	Open Manhole	2100	1.020	58.041	900	6.003	58.669	300	800
34	61.000	2.971	Open Manhole	2100	1.021	58.029	900	1.019	58.341	600	
35	60.988	3.008	Open Manhole	2100	1.022	57.980	900	1.020	58.029	900	
36	60.552	2.695	Open Manhole	2100	1.022	57.980	900	1.021	57.980	900	
37	60.552	2.695	Open Manhole	2100	1.023	57.857	150	1.022	57.907	900	
37	60.155	2.405	Open Manhole	1200	OUTFALL			1.023	57.750	150	

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PIPELINE SCHEDULES for Storm Network 1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	72.624	71.199	1.125	Open Manhole	1200
1.001	o	225	2	71.673	70.248	1.125	Open Manhole	1200
1.002	o	300	3	71.276	69.275	1.701	Open Manhole	1200
1.003	o	300	4	70.948	68.954	1.694	Open Manhole	1200
1.004	o	375	5	70.561	68.553	1.633	Open Manhole	1200
2.000	o	150	6	70.674	68.650	1.799	Open Manhole	1200
1.005	o	375	7	70.300	68.025	1.900	Open Manhole	1500
1.006	o	375	8	69.777	67.835	1.567	Open Manhole	1500
1.007	o	525	9	68.852	66.606	1.721	Open Manhole	1800
1.008	o	525	10	68.357	66.206	1.701	Open Manhole	1500
1.009	o	525	11	68.513	65.984	2.004	Open Manhole	1500
3.000	o	225	12	72.068	70.643	1.125	Open Manhole	1200
4.000	o	225	13	71.520	70.095	1.125	Open Manhole	1500
3.001	o	225	14	71.747	69.771	1.676	Open Manhole	1500
3.002	o	225	15	71.761	69.656	1.805	Open Manhole	1500
3.003	o	300	16	71.352	69.325	1.727	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	35.369	37.2	2	71.673	70.248	1.125	Open Manhole	1200
1.001	13.772	15.3	3	71.276	69.350	1.626	Open Manhole	1200
1.002	12.241	38.1	4	70.948	68.954	1.694	Open Manhole	1200
1.003	28.134	86.3	5	70.561	68.628	1.633	Open Manhole	1200
1.004	21.271	40.3	7	70.300	68.025	1.900	Open Manhole	1500
2.000	12.735	31.8	7	70.300	68.250	1.825	Open Manhole	1500
1.005	16.475	86.7	8	69.777	67.835	1.567	Open Manhole	1500
1.006	29.890	27.7	9	68.852	66.756	1.721	Open Manhole	1800
1.007	29.944	74.9	10	68.357	66.206	1.626	Open Manhole	1500
1.008	11.755	53.0	11	68.513	65.984	2.079	Open Manhole	1500
1.009	33.363	73.2	18	69.030	65.528	2.977	Open Manhole	1800
3.000	21.046	24.1	14	71.747	69.771	1.676	Open Manhole	1500
4.000	15.956	49.2	14	71.747	69.771	1.676	Open Manhole	1500
3.001	11.190	97.3	15	71.761	69.656	1.805	Open Manhole	1500
3.002	26.367	103.0	16	71.352	69.400	1.652	Open Manhole	1500
3.003	47.363	35.7	17	70.338	67.997	2.041	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network 1

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)
3.004	o	300	17	70.338	67.997	2.041	Open Manhole	1500
1.010	o	525	18	69.030	65.528	2.977	Open Manhole	1800
1.011	o	525	19	67.977	65.195	2.257	Open Manhole	1500
1.012	o	525	20	67.712	65.108	2.079	Open Manhole	1800
1.013	o	525	21	67.390	65.003	1.862	Open Manhole	1500
1.014	o	525	22	66.826	64.799	1.502	Open Manhole	1500
1.015	o	525	23	64.068	62.343	1.200	Open Manhole	1500
1.016	o	525	24	62.218	60.045	1.648	Open Manhole	1500
5.000	o	150	25	61.516	60.166	1.200	Open Manhole	1200
1.017	o	600	26	61.650	59.392	1.658	Open Manhole	1500
1.018	o	600	27	61.500	58.411	2.489	Open Manhole	1500
6.000	o	300	28	60.576	59.076	1.275	Open Manhole	1500
6.001	o	300	29	60.820	58.952	1.643	Open Manhole	1500
7.000	o	225	30	61.236	59.811	1.200	Open Manhole	1500
6.002	o	300	31	60.997	58.863	1.834	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.004	29.811	13.3	18	69.030	65.753	2.977	Open Manhole	1800
1.010	55.166	165.7	19	67.977	65.195	2.257	Open Manhole	1500
1.011	13.017	149.6	20	67.712	65.108	2.079	Open Manhole	1800
1.012	15.743	149.9	21	67.390	65.003	1.862	Open Manhole	1500
1.013	30.649	150.2	22	66.826	64.799	1.502	Open Manhole	1500
1.014	49.134	20.0	23	64.068	62.343	1.200	Open Manhole	1500
1.015	38.502	16.8	24	62.218	60.045	1.648	Open Manhole	1500
1.016	15.328	26.5	26	61.650	59.467	1.658	Open Manhole	1500
5.000	25.959	80.1	26	61.650	59.842	1.658	Open Manhole	1500
1.017	11.156	11.4	27	61.500	58.411	2.489	Open Manhole	1500
1.018	16.879	401.9	27.1	61.500	58.369	2.531	Open Manhole	1500
6.000	20.594	166.1	29	60.820	58.952	1.643	Open Manhole	1500
6.001	14.806	166.4	31	60.997	58.863	1.909	Open Manhole	1500
7.000	18.608	21.3	31	60.997	58.937	1.835	Open Manhole	1500
6.002	20.039	146.3	32	61.000	58.726	1.974	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network 1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.003	o	300	32	61.000	58.726	1.974	Open Manhole	1500
1.019	o	600	27.1	61.500	58.369	2.531	Open Manhole	1500
1.020	o	900	33	61.000	58.041	2.059	Open Manhole	2100
1.021	o	900	34	61.000	58.029	2.071	Open Manhole	2100
1.022	o	900	35	60.988	57.980	2.108	Open Manhole	2100
1.023	o	150	36	60.552	57.857	2.545	Open Manhole	2100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.003	26.484	464.6	27.1	61.500	58.669	2.531	Open Manhole	1500
1.019	14.108	503.9	33	61.000	58.341	2.059	Open Manhole	2100
1.020	4.002	333.5	34	61.000	58.029	2.071	Open Manhole	2100
1.021	21.949	447.9	35	60.988	57.980	2.108	Open Manhole	2100
1.022	32.942	451.3	36	60.552	57.907	1.745	Open Manhole	2100
1.023	10.734	100.3	37	60.155	57.750	2.255	Open Manhole	1200

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Setting Out Information - True Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	1	1200		440023.634	402329.373	
1.001	2	1200		440052.778	402349.413	
1.002	3	1200		440066.107	402352.876	
1.003	4	1200		440078.098	402350.414	
1.004	5	1200		440103.361	402338.032	
2.000	6	1200		440105.201	402313.428	
1.005	7	1500		440115.655	402320.700	
1.006	8	1500		440132.127	402320.994	
1.007	9	1800		440158.942	402307.790	
1.008	10	1500		440177.040	402283.934	
1.009	11	1500		440178.691	402272.296	
3.000	12	1200		440049.649	402301.308	
4.000	13	1500		440056.696	402271.216	
3.001	14	1500		440063.637	402285.583	
3.002	15	1500		440073.114	402291.533	
3.003	16	1500		440094.302	402275.840	

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Setting Out Information - True Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
3.004	17	1500		440137.740	402256.962	
1.010	18	1800		440163.780	402242.450	
1.011	19	1500		440213.011	402217.559	
1.012	20	1800		440225.163	402222.225	
1.013	21	1500		440232.345	402236.234	
1.014	22	1500		440253.186	402258.707	
1.015	23	1500		440286.596	402294.734	
1.016	24	1500		440312.777	402322.965	
5.000	25	1200		440307.341	402354.755	
1.017	26	1500		440323.200	402334.204	
1.018	27	1500		440332.185	402340.817	
6.000	28	1500		440306.897	402419.937	
6.001	29	1500		440318.976	402403.257	
7.000	30	1500		440303.360	402377.547	
6.002	31	1500		440318.431	402388.461	
6.003	32	1500		440330.075	402372.152	

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Setting Out Information - True Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.019	27.1	1500		440345.777	402350.825	
1.020	33	2100		440350.522	402337.539	
1.021	34	2100		440352.895	402334.317	
1.022	35	2100		440360.438	402313.705	
1.023	36	2100		440383.633	402290.313	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.023	37	1200		440394.314	402289.243	

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Setting Out Information - Site Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	1	1200		440023.634	402329.373	
1.001	2	1200		440052.778	402349.413	
1.002	3	1200		440066.107	402352.876	
1.003	4	1200		440078.098	402350.414	
1.004	5	1200		440103.361	402338.032	
2.000	6	1200		440105.201	402313.428	
1.005	7	1500		440115.655	402320.700	
1.006	8	1500		440132.127	402320.994	
1.007	9	1800		440158.942	402307.790	
1.008	10	1500		440177.040	402283.934	
1.009	11	1500		440178.691	402272.296	
3.000	12	1200		440049.649	402301.308	
4.000	13	1500		440056.696	402271.216	
3.001	14	1500		440063.637	402285.583	
3.002	15	1500		440073.114	402291.533	
3.003	16	1500		440094.302	402275.840	

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Setting Out Information - Site Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
3.004	17	1500		440137.740	402256.962	
1.010	18	1800		440163.780	402242.450	
1.011	19	1500		440213.011	402217.559	
1.012	20	1800		440225.163	402222.225	
1.013	21	1500		440232.345	402236.234	
1.014	22	1500		440253.186	402258.707	
1.015	23	1500		440286.596	402294.734	
1.016	24	1500		440312.777	402322.965	
5.000	25	1200		440307.341	402354.755	
1.017	26	1500		440323.200	402334.204	
1.018	27	1500		440332.185	402340.817	
6.000	28	1500		440306.897	402419.937	
6.001	29	1500		440318.976	402403.257	
7.000	30	1500		440303.360	402377.547	
6.002	31	1500		440318.431	402388.461	
6.003	32	1500		440330.075	402372.152	

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Setting Out Information - Site Coordinates (Storm Network 1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.019	27.1	1500		440345.777	402350.825	
1.020	33	2100		440350.522	402337.539	
1.021	34	2100		440352.895	402334.317	
1.022	35	2100		440360.438	402313.705	
1.023	36	2100		440383.633	402290.313	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.023	37	1200		440394.314	402289.243	

Surcharged Outfall Details for Storm Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.023	37	60.155	57.750	0.000	1200	0

Datum (m) 57.750 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1440	0.000	5760	0.000	10080	0.000	14400	0.000	18720	0.000
2880	0.000	7200	0.000	11520	0.000	15840	0.000	20160	0.000
4320	0.000	8640	0.000	12960	0.000	17280	0.000		

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Simulation Criteria for Storm Network 1

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.365		

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Online Controls for Storm Network 1

Hydro-Brake® Optimum Manhole: 36, DS/PN: 1.023, Volume (m³): 29.0

Unit Reference	MD-SHE-0075-3500-2150-3500
Design Head (m)	2.150
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	75
Invert Level (m)	57.857
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.150	3.5
Flush-Flo™	0.328	2.5
Kick-Flo®	0.667	2.0
Mean Flow over Head Range	-	2.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	1.200	2.7	3.000	4.1	7.000	6.1
0.200	2.4	1.400	2.9	3.500	4.4	7.500	6.3
0.300	2.5	1.600	3.0	4.000	4.7	8.000	6.5
0.400	2.5	1.800	3.2	4.500	4.9	8.500	6.7
0.500	2.4	2.000	3.4	5.000	5.2	9.000	6.8
0.600	2.3	2.200	3.5	5.500	5.4	9.500	7.0
0.800	2.2	2.400	3.7	6.000	5.6		
1.000	2.5	2.600	3.8	6.500	5.9		

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Storage Structures for Storm Network 1

Cellular Storage Manhole: 33, DS/PN: 1.020

Invert Level (m) 58.041 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1270.6	0.0	1.601	0.0	0.0
1.600	1270.6	0.0			

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

PN	US/MH Name	Surcharged		Flooded		Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	
1.000	1	-0.162	0.000	0.18		14.7	OK	
1.001	2	-0.156	0.000	0.21		23.8	OK	
1.002	3	-0.200	0.000	0.24		34.2	OK	
1.003	4	-0.176	0.000	0.36		38.8	OK	
1.004	5	-0.267	0.000	0.18		48.3	OK	
2.000	6	-0.078	0.000	0.46		14.0	OK	
1.005	7	-0.215	0.000	0.38		64.2	OK	
1.006	8	-0.262	0.000	0.20		65.8	OK	
1.007	9	-0.366	0.000	0.19		89.9	OK	
1.008	10	-0.336	0.000	0.27		98.7	OK	
1.009	11	-0.354	0.000	0.23		109.2	OK	
3.000	12	-0.166	0.000	0.15		15.6	OK	
4.000	13	-0.184	0.000	0.08		5.4	OK	
3.001	14	-0.116	0.000	0.47		21.1	OK	
3.002	15	-0.110	0.000	0.51		24.2	OK	
3.003	16	-0.203	0.000	0.22		38.7	OK	
3.004	17	-0.215	0.000	0.17		47.8	OK	
1.010	18	-0.261	0.000	0.49		165.5	OK	

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

US/MH		Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level
PN	Name								(m)
1.011	19	15 Winter	1	+0%	30/15 Summer				65.519
1.012	20	15 Winter	1	+0%	30/15 Summer				65.448
1.013	21	15 Winter	1	+0%	30/15 Summer				65.289
1.014	22	15 Winter	1	+0%					64.960
1.015	23	15 Winter	1	+0%					62.504
1.016	24	15 Winter	1	+0%					60.265
5.000	25	15 Winter	1	+0%					60.203
1.017	26	15 Winter	1	+0%					59.582
1.018	27	30 Winter	1	+0%	30/15 Summer				59.011
6.000	28	15 Winter	1	+0%	30/15 Summer				59.153
6.001	29	15 Winter	1	+0%	30/15 Summer				59.075
7.000	30	15 Winter	1	+0%					59.865
6.002	31	15 Winter	1	+0%	30/15 Summer				59.061
6.003	32	15 Winter	1	+0%	30/15 Summer				59.026
1.019	27.1	15 Summer	1	+0%	1/15 Summer				58.971
1.020	33	1440 Winter	1	+0%					58.367
1.021	34	1440 Winter	1	+0%					58.368
1.022	35	1440 Winter	1	+0%					58.368
1.023	36	1440 Winter	1	+0%	1/15 Summer				58.369

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.011	19	-0.201	0.000	0.69		171.8	OK	
1.012	20	-0.185	0.000	0.74		183.5	OK	
1.013	21	-0.239	0.000	0.57		189.9	OK	
1.014	22	-0.364	0.000	0.21		199.5	OK	
1.015	23	-0.364	0.000	0.20		208.5	OK	
1.016	24	-0.305	0.000	0.37		213.0	OK	
5.000	25	-0.113	0.000	0.14		2.7	OK	
1.017	26	-0.410	0.000	0.22		216.9	OK	
1.018	27	0.000	0.000	0.80		182.0	OK	
6.000	28	-0.223	0.000	0.15		11.9	OK	
6.001	29	-0.177	0.000	0.29		20.9	OK	
7.000	30	-0.171	0.000	0.13		14.0	OK	
6.002	31	-0.102	0.000	0.47		37.9	OK	
6.003	32	0.000	0.000	0.72		33.0	OK	
1.019	27.1	0.002	0.000	1.40		227.7	SURCHARGED	
1.020	33	-0.574	0.000	0.02		8.5	OK	
1.021	34	-0.561	0.000	0.01		7.4	OK	
1.022	35	-0.512	0.000	0.01		5.3	OK	
1.023	36	0.362	0.000	0.16		2.5	SURCHARGED	

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

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	1	-0.122	0.000	0.43		35.9	OK	
1.001	2	-0.112	0.000	0.50		58.4	OK	
1.002	3	-0.134	0.000	0.59		83.9	OK	
1.003	4	-0.081	0.000	0.88		94.8	OK	
1.004	5	-0.200	0.000	0.44		117.9	OK	
2.000	6	0.110	0.000	1.12		33.7	SURCHARGED	
1.005	7	-0.089	0.000	0.91		155.7	OK	
1.006	8	-0.190	0.000	0.48		162.3	OK	
1.007	9	-0.266	0.000	0.47		219.8	OK	
1.008	10	0.013	0.000	0.65		234.6	SURCHARGED	
1.009	11	0.118	0.000	0.51		245.2	SURCHARGED	
3.000	12	-0.129	0.000	0.38		38.3	OK	
4.000	13	-0.159	0.000	0.19		13.1	OK	
3.001	14	0.102	0.000	1.07		47.6	SURCHARGED	
3.002	15	0.081	0.000	1.16		55.1	SURCHARGED	
3.003	16	-0.146	0.000	0.51		88.9	OK	
3.004	17	-0.167	0.000	0.40		110.5	OK	
1.010	18	0.366	0.000	0.99		335.7	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.011	19	15 Winter	30	+0%	30/15 Summer				66.095
1.012	20	15 Winter	30	+0%	30/15 Summer				65.878
1.013	21	15 Winter	30	+0%	30/15 Summer				65.613
1.014	22	15 Winter	30	+0%					65.042
1.015	23	15 Winter	30	+0%					62.585
1.016	24	15 Winter	30	+0%					60.400
5.000	25	15 Winter	30	+0%					60.227
1.017	26	15 Winter	30	+0%					59.684
1.018	27	15 Winter	30	+0%	30/15 Summer				59.413
6.000	28	15 Winter	30	+0%	30/15 Summer				59.600
6.001	29	15 Winter	30	+0%	30/15 Summer				59.531
7.000	30	15 Winter	30	+0%					59.898
6.002	31	15 Winter	30	+0%	30/15 Summer				59.436
6.003	32	15 Winter	30	+0%	30/15 Summer				59.309
1.019	27.1	15 Winter	30	+0%	1/15 Summer				59.193
1.020	33	2160 Winter	30	+0%					58.857
1.021	34	2160 Winter	30	+0%					58.857
1.022	35	2160 Winter	30	+0%					58.856
1.023	36	2160 Winter	30	+0%	1/15 Summer				58.853

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.011	19	0.375	0.000	1.43		354.5	SURCHARGED	
1.012	20	0.245	0.000	1.54		383.5	SURCHARGED	
1.013	21	0.085	0.000	1.21		400.8	SURCHARGED	
1.014	22	-0.282	0.000	0.44		423.7	OK	
1.015	23	-0.283	0.000	0.43		444.5	OK	
1.016	24	-0.170	0.000	0.78		452.7	OK	
5.000	25	-0.089	0.000	0.35		6.7	OK	
1.017	26	-0.308	0.000	0.47		461.8	OK	
1.018	27	0.402	0.000	2.05		466.0	SURCHARGED	
6.000	28	0.224	0.000	0.30		24.2	SURCHARGED	
6.001	29	0.279	0.000	0.57		41.0	SURCHARGED	
7.000	30	-0.138	0.000	0.32		34.3	OK	
6.002	31	0.273	0.000	0.96		76.8	SURCHARGED	
6.003	32	0.283	0.000	1.60		73.6	SURCHARGED	
1.019	27.1	0.224	0.000	3.26		531.9	SURCHARGED	
1.020	33	-0.084	0.000	0.02		8.4	OK	
1.021	34	-0.072	0.000	0.01		7.5	OK	
1.022	35	-0.024	0.000	0.01		5.3	OK	
1.023	36	0.846	0.000	0.16		2.5	SURCHARGED	