

Robert E Fry & Associates		Page 1
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

« - 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
1.000	27.064	0.180	150.4	0.055	5.00	5.4	0.600	o	225	Pipe/Conduit	
1.001	18.138	0.121	150.0	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	8.631	0.052	167.0	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	58.198	0.576	101.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	40.083	0.395	101.5	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	25.768	0.379	68.0	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	18.145	0.076	238.8	0.057	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	23.900	0.092	259.8	0.057	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	14.621	0.059	247.8	0.057	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	14.059	0.056	250.0	0.057	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	18.233	0.506	36.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	24.424	0.394	62.0	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	18.460	0.111	166.3	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.003	21.733	0.130	167.2	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.004	38.449	0.520	74.0	0.109	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.005	38.095	0.845	45.1	0.057	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	22.389	0.057	392.8	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	49.89	5.42	84.703	0.055	5.4	0.0	0.0	1.06	42.3	12.8
1.001	48.89	5.71	84.523	0.112	5.4	0.0	0.0	1.07	42.4	20.2
1.002	48.41	5.85	84.402	0.169	5.4	0.0	0.0	1.01	40.1	27.6
1.003	46.42	6.47	84.275	0.226	5.4	0.0	0.0	1.56	110.6	33.8
1.004	45.17	6.90	83.699	0.283	5.4	0.0	0.0	1.56	110.3	40.0
1.005	44.62	7.09	83.229	0.340	5.4	0.0	0.0	2.20	243.0	46.5
1.006	43.99	7.32	82.775	0.397	5.4	0.0	0.0	1.31	208.6	52.7
1.007	43.17	7.64	82.699	0.454	5.4	0.0	0.0	1.26	199.9	58.5
1.008	42.70	7.83	82.607	0.511	5.4	0.0	0.0	1.29	204.7	64.5
1.009	42.25	8.01	82.548	0.568	5.4	0.0	0.0	1.28	203.8	70.4
2.000	50.96	5.14	84.031	0.055	0.0	0.0	0.0	2.19	86.9	7.6
2.001	50.04	5.38	83.525	0.112	0.0	0.0	0.0	1.66	66.2	15.2
2.002	49.14	5.64	83.056	0.169	0.0	0.0	0.0	1.22	86.0	22.5
2.003	48.25	5.90	82.870	0.226	0.0	0.0	0.0	1.40	154.5	29.5
2.004	47.26	6.20	82.740	0.335	0.0	0.0	0.0	2.11	232.9	42.9
2.005	46.61	6.41	82.145	0.392	0.0	0.0	0.0	3.03	482.6	49.5
1.010	41.78	8.21	79.147	1.017	5.4	0.0	0.0	1.88	2128.0	120.5

Robert E Fry & Associates		Page 2
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

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
1.011	19.251	0.049	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.012	18.669	0.047	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
3.000	34.854	0.387	90.0	0.109	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.013	14.096	0.036	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.014	16.103	0.041	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.015	31.802	0.081	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.016	45.351	0.115	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
4.000	24.130	0.241	100.1	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	14.878	0.309	48.2	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	30.730	0.184	167.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	36.041	0.291	123.8	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.000	25.956	1.005	25.8	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.004	47.091	0.400	117.7	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.000	36.364	0.380	95.7	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	26.218	0.425	61.7	0.057	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)
1.011	41.38	8.38	79.090	1.074	5.4	0.0	0.0	1.88	2122.0	125.8
1.012	41.01	8.55	79.041	1.131	5.4	0.0	0.0	1.88	2122.0	131.0
3.000	50.16	5.35	82.000	0.109	0.0	0.0	0.0	1.66	117.2	14.8
1.013	40.73	8.67	78.994	1.297	5.4	0.0	0.0	1.88	2122.0	148.5
1.014	40.42	8.82	78.958	1.354	5.4	0.0	0.0	1.88	2122.0	153.6
1.015	39.82	9.10	78.918	1.411	5.4	0.0	0.0	1.88	2122.0	157.6
1.016	39.00	9.50	78.837	1.468	5.4	0.0	0.0	1.88	2122.0	160.5
4.000	50.32	5.31	83.220	0.055	0.0	0.0	0.0	1.31	52.0	7.5
4.001	49.84	5.44	82.979	0.112	0.0	0.0	0.0	1.89	75.1	15.1
4.002	48.37	5.86	82.595	0.169	0.0	0.0	0.0	1.21	85.8	22.1
4.003	46.99	6.29	82.411	0.226	0.0	0.0	0.0	1.41	99.8	28.8
5.000	50.85	5.17	83.200	0.055	0.0	0.0	0.0	2.59	102.8	7.6
4.004	45.37	6.83	82.120	0.338	0.0	0.0	0.0	1.45	102.4	41.5
6.000	49.79	5.45	82.600	0.055	0.0	0.0	0.0	1.34	53.2	7.4
6.001	49.02	5.67	82.145	0.112	0.0	0.0	0.0	2.01	141.7	14.9

Robert E Fry & Associates		Page 3
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.005	58.279	0.951	61.3	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.017	38.798	0.098	395.9	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.018	13.697	0.035	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
7.000	29.886	0.325	92.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.001	28.527	0.313	91.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.002	24.612	0.147	167.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.003	11.687	0.070	167.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.004	15.404	0.092	167.4	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.005	13.001	0.144	90.0	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.006	13.172	0.146	90.0	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.000	36.765	0.240	153.2	0.055	5.00	0.0	0.600	o	300	Pipe/Conduit	
8.001	35.046	0.219	160.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.000	32.529	0.325	100.1	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
9.001	31.073	0.311	99.9	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.002	22.691	0.136	167.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.005	44.20	7.25	81.645	0.507	0.0	0.0	0.0	2.32	256.0	60.7
1.017	38.33	9.85	78.722	2.032	5.4	0.0	0.0	1.87	2119.6	216.3
1.018	38.10	9.97	78.624	2.089	5.4	0.0	0.0	1.89	2135.6	221.0
7.000	50.11	5.37	82.300	0.055	0.0	0.0	0.0	1.36	54.2	7.5
7.001	49.08	5.65	81.900	0.112	0.0	0.0	0.0	1.65	116.5	14.9
7.002	47.94	5.99	81.587	0.169	0.0	0.0	0.0	1.21	85.8	21.9
7.003	47.41	6.15	81.439	0.226	0.0	0.0	0.0	1.21	85.8	29.0
7.004	46.84	6.34	81.294	0.283	0.0	0.0	0.0	1.40	154.3	35.9
7.005	46.49	6.45	81.202	0.340	0.0	0.0	0.0	1.91	211.0	42.8
7.006	46.14	6.56	81.058	0.397	0.0	0.0	0.0	1.91	211.0	49.6
8.000	49.68	5.48	80.820	0.055	0.0	0.0	0.0	1.27	89.6	7.4
8.001	48.06	5.95	80.580	0.112	0.0	0.0	0.0	1.24	87.7	14.6
9.000	49.93	5.41	81.072	0.055	0.0	0.0	0.0	1.31	52.0	7.4
9.001	48.77	5.74	80.672	0.112	0.0	0.0	0.0	1.57	111.2	14.8
8.002	47.05	6.27	80.361	0.281	0.0	0.0	0.0	1.21	85.8	35.8

Robert E Fry & Associates		Page 4
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

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
8.003	23.158	0.214	108.2	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.007	22.910	0.058	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
7.008	12.480	0.032	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
10.000	27.601	0.276	100.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	25.137	0.550	45.7	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.009	43.925	0.113	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
7.010	19.221	0.057	337.9	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.000	17.753	0.178	99.7	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
11.001	16.318	0.197	82.8	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.002	14.406	0.037	389.4	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.003	12.395	0.032	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.004	10.707	0.027	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.005	19.729	0.051	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.006	12.354	0.032	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.007	11.151	0.029	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.008	38.204	0.098	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
11.009	39.897	0.102	390.0	0.057	0.00	0.0	0.600	o	1200	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)
8.003	46.37	6.49	80.150	0.338	0.0	0.0	0.0	1.74	192.3	42.4
7.007	45.54	6.77	79.111	0.792	0.0	0.0	0.0	1.88	2122.0	97.7
7.008	45.22	6.88	79.053	0.849	0.0	0.0	0.0	1.88	2122.0	104.0
10.000	50.16	5.35	80.822	0.055	0.0	0.0	0.0	1.31	52.0	7.5
10.001	49.51	5.53	80.471	0.112	0.0	0.0	0.0	2.33	164.8	15.0
7.009	44.15	7.27	79.021	1.018	0.0	0.0	0.0	1.89	2135.6	121.7
7.010	43.73	7.42	78.908	1.075	0.0	0.0	0.0	2.03	2295.6	127.3
11.000	50.63	5.23	80.660	0.055	0.0	0.0	0.0	1.31	52.1	7.5
11.001	49.93	5.42	80.482	0.112	0.0	0.0	0.0	1.44	57.2	15.1
11.002	49.47	5.54	79.310	0.169	0.0	0.0	0.0	1.89	2137.4	22.6
11.003	49.09	5.65	79.273	0.226	0.0	0.0	0.0	1.89	2135.6	30.0
11.004	48.76	5.75	79.241	0.283	0.0	0.0	0.0	1.89	2135.6	37.4
11.005	48.17	5.92	79.214	0.340	0.0	0.0	0.0	1.89	2135.6	44.4
11.006	47.81	6.03	79.163	0.397	0.0	0.0	0.0	1.89	2135.6	51.4
11.007	47.49	6.13	79.132	0.454	0.0	0.0	0.0	1.89	2135.6	58.4
11.008	46.44	6.46	79.103	0.511	0.0	0.0	0.0	1.89	2135.6	64.3
11.009	45.40	6.82	79.005	0.568	0.0	0.0	0.0	1.89	2135.6	69.8

Robert E Fry & Associates		Page 5
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
11.010	19.955	0.051	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
7.011	13.047	0.033	395.4	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
7.012	62.951	0.229	274.5	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.019	10.664	0.027	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
12.000	33.506	0.763	43.9	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.020	11.319	0.057	200.0	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.021	60.053	0.150	400.4	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.022	33.191	0.083	399.9	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.000	46.552	0.119	391.2	0.055	5.00	0.0	0.600	o	1200	Pipe/Conduit	
13.001	24.124	0.062	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.002	17.748	0.046	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
14.000	22.846	0.059	390.0	0.055	5.00	0.0	0.600	o	1200	Pipe/Conduit	
14.001	27.665	0.072	385.4	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.003	22.375	0.057	390.0	0.057	0.00	0.0	0.600	o	1200	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)
11.010	44.90	6.99	78.903	0.625	0.0	0.0	0.0	1.89	2135.6	76.0
7.011	43.43	7.54	78.851	1.757	0.0	0.0	0.0	1.88	2121.0	206.7
7.012	42.27	8.01	78.818	1.814	0.0	0.0	0.0	2.25	2548.4	207.7
1.019	37.93	10.06	78.589	3.960	5.4	0.0	0.0	1.88	2122.1	412.2
12.000	50.42	5.28	80.300	0.055	0.0	0.0	0.0	1.98	78.7	7.5
1.020	37.66	10.21	78.562	4.072	5.4	0.0	0.0	1.28	141.1	420.7
1.021	36.71	10.75	77.680	4.129	5.4	0.0	0.0	1.86	2107.7	420.7
1.022	36.21	11.04	77.530	4.186	5.4	0.0	0.0	1.86	2108.9	420.7
13.000	49.94	5.41	78.028	0.055	0.0	0.0	0.0	1.89	2132.4	7.4
13.001	49.18	5.62	77.909	0.112	0.0	0.0	0.0	1.89	2135.6	14.9
13.002	48.64	5.78	77.847	0.169	0.0	0.0	0.0	1.89	2135.6	22.3
14.000	50.72	5.20	77.932	0.055	0.0	0.0	0.0	1.89	2135.6	7.6
14.001	49.82	5.44	77.873	0.112	0.0	0.0	0.0	1.90	2148.5	15.1
13.003	47.98	5.98	77.802	0.338	0.0	0.0	0.0	1.89	2135.6	43.9

Robert E Fry & Associates		Page 6
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
13.004	20.064	0.051	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.005	16.695	0.043	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
15.000	33.284	0.333	100.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
15.001	30.381	0.392	77.5	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
13.006	17.572	0.044	400.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.007	42.768	0.107	399.7	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
13.008	12.226	0.052	235.1	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.023	15.311	0.039	392.6	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.024	14.790	0.037	395.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
16.000	35.906	0.717	50.1	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
16.001	21.769	0.435	50.0	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
17.000	29.030	0.720	40.3	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
16.002	41.779	0.808	51.7	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
16.003	19.907	0.347	57.4	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
16.004	25.857	0.625	41.4	0.057	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)
13.004	47.40	6.16	77.744	0.395	0.0	0.0	0.0	1.89	2135.6	50.7
13.005	46.94	6.30	77.693	0.452	0.0	0.0	0.0	1.89	2135.6	57.5
15.000	49.89	5.42	79.350	0.055	0.0	0.0	0.0	1.31	52.0	7.4
15.001	48.89	5.71	78.942	0.112	0.0	0.0	0.0	1.79	126.4	14.8
13.006	46.45	6.46	77.650	0.621	0.0	0.0	0.0	1.86	2108.6	78.1
13.007	45.33	6.84	77.606	0.678	0.0	0.0	0.0	1.87	2109.4	83.2
13.008	45.09	6.93	77.499	0.735	0.0	0.0	0.0	2.44	2754.7	89.7
1.023	35.99	11.18	77.447	4.978	5.4	0.0	0.0	1.88	2128.5	490.6
1.024	35.78	11.31	77.408	5.035	5.4	0.0	0.0	1.88	2122.0	493.3
16.000	50.26	5.32	82.050	0.055	0.0	0.0	0.0	1.85	73.7	7.5
16.001	49.55	5.52	81.333	0.112	0.0	0.0	0.0	1.85	73.7	15.0
17.000	50.60	5.23	81.618	0.055	0.0	0.0	0.0	2.07	82.2	7.5
16.002	48.45	5.84	80.823	0.224	0.0	0.0	0.0	2.19	154.9	29.4
16.003	47.99	5.97	79.940	0.281	0.0	0.0	0.0	2.40	264.7	36.5
16.004	47.49	6.13	79.593	0.338	0.0	0.0	0.0	2.82	311.9	43.5

Robert E Fry & Associates		Page 7
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

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
16.005	24.376	0.581	42.0	0.057	0.00	0.0	0.600	o	375	Pipe/Conduit	
18.000	14.243	0.250	57.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
18.001	20.739	0.250	83.0	0.057	0.00	0.0	0.600	o	225	Pipe/Conduit	
18.002	18.220	0.163	111.8	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
16.006	14.277	0.037	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
16.007	12.442	0.032	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
16.008	9.038	0.123	73.5	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.025	26.522	0.068	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.026	15.482	0.040	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.027	14.180	0.036	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
19.000	28.860	0.074	390.0	0.055	5.00	0.0	0.600	o	1200	Pipe/Conduit	
19.001	21.696	0.056	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
19.002	15.646	0.040	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
19.003	14.121	0.036	390.0	0.057	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.028	49.551	0.127	390.0	0.056	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.029	33.081	0.085	390.0	0.000	0.00	0.0	0.600	o	1200	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)
16.005	47.03	6.27	78.968	0.395	0.0	0.0	0.0	2.80	309.7	50.3
18.000	50.96	5.14	79.200	0.055	0.0	0.0	0.0	1.74	69.0	7.6
18.001	50.06	5.38	78.950	0.112	0.0	0.0	0.0	1.44	57.1	15.2
18.002	49.33	5.58	78.625	0.169	0.0	0.0	0.0	1.49	105.1	22.6
16.006	46.64	6.40	77.562	0.621	0.0	0.0	0.0	1.89	2135.6	78.4
16.007	46.31	6.51	77.525	0.678	0.0	0.0	0.0	1.89	2135.6	85.0
16.008	46.20	6.54	77.493	0.735	0.0	0.0	0.0	4.37	4937.7	92.0
1.025	35.41	11.55	77.371	5.827	5.4	0.0	0.0	1.89	2135.6	564.2
1.026	35.20	11.68	77.303	5.884	5.4	0.0	0.0	1.89	2135.6	566.3
1.027	35.01	11.81	77.263	5.941	5.4	0.0	0.0	1.89	2135.6	568.7
19.000	50.52	5.25	77.432	0.055	0.0	0.0	0.0	1.89	2135.6	7.5
19.001	49.81	5.45	77.358	0.112	0.0	0.0	0.0	1.89	2135.6	15.1
19.002	49.32	5.58	77.302	0.169	0.0	0.0	0.0	1.89	2135.6	22.6
19.003	48.89	5.71	77.262	0.226	0.0	0.0	0.0	1.89	2135.6	29.9
1.028	34.36	12.24	77.226	6.223	5.4	0.0	0.0	1.89	2135.6	584.5
1.029	33.94	12.54	77.099	6.223	5.4	0.0	0.0	1.89	2135.6	584.5

Robert E Fry & Associates		Page 8
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for SW1.SWS

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
1.030	7.825	0.031	252.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.031	78.545	0.266	295.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.032	89.179	1.328	67.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.033	97.098	0.647	150.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.034	79.691	0.530	150.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.035	99.821	6.212	16.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.036	27.302	3.165	8.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.037	41.620	4.285	9.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.038	25.596	2.864	8.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.039	49.884	5.851	8.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.040	72.446	6.335	11.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.041	2.616	0.006	436.0	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)
1.030	33.78	12.65	77.014	6.223	5.4	0.0	0.0	1.14	125.4«	584.5
1.031	32.15	13.90	76.983	6.223	5.4	0.0	0.0	1.05	115.9«	584.5
1.032	31.35	14.57	76.717	6.223	5.4	0.0	0.0	2.21	244.5«	584.5
1.033	30.14	15.67	75.389	6.223	5.4	0.0	0.0	1.48	163.1«	584.5
1.034	29.25	16.57	74.742	6.223	5.4	0.0	0.0	1.48	162.9«	584.5
1.035	28.90	16.93	74.212	6.223	5.4	0.0	0.0	4.54	501.4«	584.5
1.036	28.84	17.01	68.000	6.223	5.4	0.0	0.0	6.20	684.8	584.5
1.037	28.73	17.13	64.835	6.223	5.4	0.0	0.0	5.84	645.3	584.5
1.038	28.66	17.20	60.550	6.223	5.4	0.0	0.0	6.09	672.8	584.5
1.039	28.54	17.33	57.686	6.223	5.4	0.0	0.0	6.24	688.8	584.5
1.040	28.34	17.55	51.835	6.223	5.4	0.0	0.0	5.38	594.6	584.5
1.041	28.30	17.60	45.500	6.223	5.4	0.0	0.0	0.86	95.1«	584.5

Robert E Fry & Associates		Page 9
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Manhole Schedules for SW1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	87.353	2.650	Open Manhole	1200	1.000	84.703	225				
2	86.800	2.277	Open Manhole	1200	1.001	84.523	225	1.000	84.523	225	
3	86.446	2.044	Open Manhole	1200	1.002	84.402	225	1.001	84.402	225	
4	86.410	2.135	Open Manhole	1350	1.003	84.275	300	1.002	84.350	225	
5	85.738	2.039	Open Manhole	1350	1.004	83.699	300	1.003	83.699	300	
6	85.100	1.871	Open Manhole	1350	1.005	83.229	375	1.004	83.304	300	
7	84.752	1.977	Open Manhole	1500	1.006	82.775	450	1.005	82.850	375	
8	84.481	1.782	Open Manhole	1500	1.007	82.699	450	1.006	82.699	450	
9	84.644	2.037	Open Manhole	1500	1.008	82.607	450	1.007	82.607	450	
10	84.809	2.261	Open Manhole	1500	1.009	82.548	450	1.008	82.548	450	
11	86.168	2.137	Open Manhole	1200	2.000	84.031	225				
12	86.206	2.681	Open Manhole	1200	2.001	83.525	225	2.000	83.525	225	
13	86.245	3.189	Open Manhole	1350	2.002	83.056	300	2.001	83.131	225	
14	86.011	3.141	Open Manhole	1350	2.003	82.870	375	2.002	82.945	300	
15	85.717	2.977	Open Manhole	1350	2.004	82.740	375	2.003	82.740	375	
16	85.105	2.960	Open Manhole	1500	2.005	82.145	450	2.004	82.220	375	
17	84.900	5.753	Open Manhole	2400	1.010	79.147	1200	1.009	82.492	450	2595
								2.005	81.300	450	1403
18	85.069	5.979	Open Manhole	2400	1.011	79.090	1200	1.010	79.090	1200	
19	84.870	5.829	Open Manhole	2400	1.012	79.041	1200	1.011	79.041	1200	
20	85.232	3.232	Open Manhole	1350	3.000	82.000	300				
21	84.972	5.978	Open Manhole	2400	1.013	78.994	1200	1.012	78.994	1200	
								3.000	81.613	300	1719
22	84.760	5.802	Open Manhole	2400	1.014	78.958	1200	1.013	78.958	1200	
23	84.470	5.552	Open Manhole	2400	1.015	78.918	1200	1.014	78.918	1200	
24	84.137	5.300	Open Manhole	2400	1.016	78.837	1200	1.015	78.837	1200	
25	85.400	2.180	Open Manhole	1200	4.000	83.220	225				
26	85.200	2.221	Open Manhole	1200	4.001	82.979	225	4.000	82.979	225	
27	84.850	2.255	Open Manhole	1350	4.002	82.595	300	4.001	82.670	225	
28	84.850	2.439	Open Manhole	1350	4.003	82.411	300	4.002	82.411	300	
29	84.900	1.700	Open Manhole	1200	5.000	83.200	225				
30	84.600	2.480	Open Manhole	1350	4.004	82.120	300	4.003	82.120	300	
								5.000	82.195	225	
31	84.780	2.180	Open Manhole	1200	6.000	82.600	225				
32	84.400	2.255	Open Manhole	1350	6.001	82.145	300	6.000	82.220	225	
33	84.050	2.405	Open Manhole	1350	4.005	81.645	375	4.004	81.720	300	
								6.001	81.720	300	
34	83.100	4.378	Open Manhole	2400	1.017	78.722	1200	1.016	78.722	1200	

Robert E Fry & Associates		Page 10
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Manhole Schedules for SW1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
35	82.570	3.946	Open Manhole	2400	1.018	78.624	1200	4.005	80.694	375	1147
36	84.000	1.700	Open Manhole	1200	7.000	82.300	225	1.017	78.624	1200	
37	84.300	2.400	Open Manhole	1350	7.001	81.900	300	7.000	81.975	225	
38	84.120	2.533	Open Manhole	1350	7.002	81.587	300	7.001	81.587	300	
39	83.820	2.381	Open Manhole	1350	7.003	81.439	300	7.002	81.439	300	
40	83.829	2.535	Open Manhole	1350	7.004	81.294	375	7.003	81.369	300	
41	83.462	2.260	Open Manhole	1350	7.005	81.202	375	7.004	81.202	375	
42	83.300	2.242	Open Manhole	1350	7.006	81.058	375	7.005	81.058	375	
43	82.701	1.881	Open Manhole	1350	8.000	80.820	300				
44	83.100	2.520	Open Manhole	1350	8.001	80.580	300	8.000	80.580	300	
45	83.400	2.328	Open Manhole	1200	9.000	81.072	225				
46	83.300	2.628	Open Manhole	1350	9.001	80.672	300	9.000	80.747	225	
47	83.200	2.839	Open Manhole	1350	8.002	80.361	300	8.001	80.361	300	
								9.001	80.361	300	
48	83.060	2.910	Open Manhole	1350	8.003	80.150	375	8.002	80.225	300	
49	83.113	4.002	Open Manhole	2400	7.007	79.111	1200	7.006	80.911	375	975
								8.003	79.936	375	
50	82.900	3.847	Open Manhole	2400	7.008	79.053	1200	7.007	79.053	1200	
51	82.637	1.815	Open Manhole	1200	10.000	80.822	225				
52	82.750	2.279	Open Manhole	1350	10.001	80.471	300	10.000	80.546	225	
53	82.720	3.699	Open Manhole	2400	7.009	79.021	1200	7.008	79.021	1200	
								10.001	79.921	300	
54	82.400	3.492	Open Manhole	2400	7.010	78.908	1200	7.009	78.908	1200	
55	82.382	1.722	Open Manhole	1200	11.000	80.660	225				
56	82.514	2.032	Open Manhole	1200	11.001	80.482	225	11.000	80.482	225	
57	82.696	3.386	Open Manhole	2400	11.002	79.310	1200	11.001	80.285	225	
58	82.833	3.560	Open Manhole	2400	11.003	79.273	1200	11.002	79.273	1200	
59	82.987	3.746	Open Manhole	2400	11.004	79.241	1200	11.003	79.241	1200	
60	83.107	3.893	Open Manhole	2400	11.005	79.214	1200	11.004	79.214	1200	
61	83.319	4.156	Open Manhole	2400	11.006	79.163	1200	11.005	79.163	1200	
62	83.463	4.332	Open Manhole	2400	11.007	79.132	1200	11.006	79.132	1200	
63	83.574	4.471	Open Manhole	2400	11.008	79.103	1200	11.007	79.103	1200	
64	83.278	4.273	Open Manhole	2400	11.009	79.005	1200	11.008	79.005	1200	
65	82.763	3.860	Open Manhole	2400	11.010	78.903	1200	11.009	78.903	1200	
66	82.575	3.724	Open Manhole	2400	7.011	78.851	1200	7.010	78.851	1200	
								11.010	78.851	1200	
67	82.695	3.877	Open Manhole	2400	7.012	78.818	1200	7.011	78.818	1200	

Robert E Fry & Associates		Page 11
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Manhole Schedules for SW1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
68	82.446	3.857	Open Manhole	2400	1.019	78.589	1200	1.018	78.589	1200	825
69	81.758	1.458	Open Manhole	1200	12.000	80.300	225	7.012	78.589	1200	
70	82.346	3.784	Open Manhole	2400	1.020	78.562	375	1.019	78.562	1200	
71	82.245	4.565	Open Manhole	2400	1.021	77.680	1200	12.000	79.537	225	
72	81.139	3.609	Open Manhole	2400	1.022	77.530	1200	1.020	78.505	375	
73	81.900	3.872	Open Manhole	2400	13.000	78.028	1200	1.021	77.530	1200	
74	81.000	3.091	Open Manhole	2400	13.001	77.909	1200	13.000	77.909	1200	
75	80.877	3.030	Open Manhole	2400	13.002	77.847	1200	13.001	77.847	1200	
76	82.800	4.868	Open Manhole	2400	14.000	77.932	1200	14.000	77.873	1200	
77	82.600	4.727	Open Manhole	2400	14.001	77.873	1200	13.002	77.802	1200	
78	81.300	3.498	Open Manhole	2400	13.003	77.802	1200	14.001	77.802	1200	
79	80.787	3.043	Open Manhole	2400	13.004	77.744	1200	13.003	77.744	1200	
80	80.555	2.862	Open Manhole	2400	13.005	77.693	1200	13.004	77.693	1200	
81	80.750	1.400	Open Manhole	1200	15.000	79.350	225	15.000	79.017	225	
82	80.900	1.958	Open Manhole	1350	15.001	78.942	300	13.005	77.650	1200	
83	80.400	2.750	Open Manhole	2400	13.006	77.650	1200	15.001	78.550	300	
84	80.180	2.574	Open Manhole	2400	13.007	77.606	1200	13.006	77.606	1200	
85	80.050	2.551	Open Manhole	2400	13.008	77.499	1200	13.007	77.499	1200	
86	80.050	2.603	Open Manhole	2400	1.023	77.447	1200	1.022	77.447	1200	
87	80.305	2.897	Open Manhole	2400	1.024	77.408	1200	13.008	77.447	1200	
88	83.887	1.837	Open Manhole	1200	16.000	82.050	225	1.023	77.408	1200	
89	83.170	1.837	Open Manhole	1200	16.001	81.333	225	16.000	81.333	225	
90	83.100	1.482	Open Manhole	1200	17.000	81.618	225	16.001	80.898	225	
91	82.380	1.557	Open Manhole	1350	16.002	80.823	300	17.000	80.898	225	
92	81.572	1.632	Open Manhole	1350	16.003	79.940	375	16.002	80.015	300	
93	81.225	1.632	Open Manhole	1350	16.004	79.593	375	16.003	79.593	375	
94	80.600	1.632	Open Manhole	1350	16.005	78.968	375	16.004	78.968	375	
95	80.600	1.400	Open Manhole	1200	18.000	79.200	225	18.000	78.950	225	
96	80.350	1.400	Open Manhole	1200	18.001	78.950	225	18.001	78.700	225	
97	80.100	1.475	Open Manhole	1350	18.002	78.625	300	16.005	78.387	375	
98	80.200	2.638	Open Manhole	2400	16.006	77.562	1200	18.002	78.462	300	

Robert E Fry & Associates		Page 12
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Manhole Schedules for SW1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
99	80.300	2.775	Open Manhole	2400	16.007	77.525	1200	16.006	77.525	1200	
100	80.400	2.907	Open Manhole	2400	16.008	77.493	1200	16.007	77.493	1200	
101	80.500	3.129	Open Manhole	2400	1.025	77.371	1200	1.024	77.371	1200	
								16.008	77.371	1200	
102	80.300	2.997	Open Manhole	2400	1.026	77.303	1200	1.025	77.303	1200	
103	80.100	2.837	Open Manhole	2400	1.027	77.263	1200	1.026	77.263	1200	
104	80.300	2.868	Open Manhole	2400	19.000	77.432	1200				
105	80.000	2.642	Open Manhole	2400	19.001	77.358	1200	19.000	77.358	1200	
106	79.800	2.498	Open Manhole	2400	19.002	77.302	1200	19.001	77.302	1200	
107	80.000	2.738	Open Manhole	2400	19.003	77.262	1200	19.002	77.262	1200	
108	80.200	2.974	Open Manhole	2400	1.028	77.226	1200	1.027	77.226	1200	
								19.003	77.226	1200	
109	80.500	3.401	Open Manhole	2400	1.029	77.099	1200	1.028	77.099	1200	
110	81.352	4.338	Open Manhole	2400	1.030	77.014	375	1.029	77.014	1200	
111	81.712	4.729	Open Manhole	1350	1.031	76.983	375	1.030	76.983	375	
112	79.409	2.692	Open Manhole	1350	1.032	76.717	375	1.031	76.717	375	
113	77.675	2.286	Open Manhole	1350	1.033	75.389	375	1.032	75.389	375	
114	77.118	2.376	Open Manhole	1350	1.034	74.742	375	1.033	74.742	375	
115	76.561	2.349	Open Manhole	1350	1.035	74.212	375	1.034	74.212	375	
116	70.515	2.515	Open Manhole	1350	1.036	68.000	375	1.035	68.000	375	
117	67.350	2.515	Open Manhole	1350	1.037	64.835	375	1.036	64.835	375	
118	63.019	2.469	Open Manhole	1350	1.038	60.550	375	1.037	60.550	375	
119	60.226	2.540	Open Manhole	1350	1.039	57.686	375	1.038	57.686	375	
120	54.895	3.060	Open Manhole	1350	1.040	51.835	375	1.039	51.835	375	
121	47.501	2.001	Open Manhole	1350	1.041	45.500	375	1.040	45.500	375	
122	47.562	2.068	Open Manhole	0		OUTFALL		1.041	45.494	375	

Robert E Fry & Associates		Page 13
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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	87.353	84.703	2.425	Open Manhole	1200
1.001	o	225	2	86.800	84.523	2.052	Open Manhole	1200
1.002	o	225	3	86.446	84.402	1.819	Open Manhole	1200
1.003	o	300	4	86.410	84.275	1.835	Open Manhole	1350
1.004	o	300	5	85.738	83.699	1.739	Open Manhole	1350
1.005	o	375	6	85.100	83.229	1.496	Open Manhole	1350
1.006	o	450	7	84.752	82.775	1.527	Open Manhole	1500
1.007	o	450	8	84.481	82.699	1.332	Open Manhole	1500
1.008	o	450	9	84.644	82.607	1.587	Open Manhole	1500
1.009	o	450	10	84.809	82.548	1.811	Open Manhole	1500
2.000	o	225	11	86.168	84.031	1.912	Open Manhole	1200
2.001	o	225	12	86.206	83.525	2.456	Open Manhole	1200
2.002	o	300	13	86.245	83.056	2.889	Open Manhole	1350
2.003	o	375	14	86.011	82.870	2.766	Open Manhole	1350
2.004	o	375	15	85.717	82.740	2.602	Open Manhole	1350
2.005	o	450	16	85.105	82.145	2.510	Open Manhole	1500
1.010	o	1200	17	84.900	79.147	4.553	Open Manhole	2400
1.011	o	1200	18	85.069	79.090	4.779	Open Manhole	2400
1.012	o	1200	19	84.870	79.041	4.629	Open Manhole	2400

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	27.064	150.4	2	86.800	84.523	2.052	Open Manhole	1200
1.001	18.138	150.0	3	86.446	84.402	1.819	Open Manhole	1200
1.002	8.631	167.0	4	86.410	84.350	1.835	Open Manhole	1350
1.003	58.198	101.0	5	85.738	83.699	1.739	Open Manhole	1350
1.004	40.083	101.5	6	85.100	83.304	1.496	Open Manhole	1350
1.005	25.768	68.0	7	84.752	82.850	1.527	Open Manhole	1500
1.006	18.145	238.8	8	84.481	82.699	1.332	Open Manhole	1500
1.007	23.900	259.8	9	84.644	82.607	1.587	Open Manhole	1500
1.008	14.621	247.8	10	84.809	82.548	1.811	Open Manhole	1500
1.009	14.059	250.0	17	84.900	82.492	1.958	Open Manhole	2400
2.000	18.233	36.0	12	86.206	83.525	2.456	Open Manhole	1200
2.001	24.424	62.0	13	86.245	83.131	2.889	Open Manhole	1350
2.002	18.460	166.3	14	86.011	82.945	2.766	Open Manhole	1350
2.003	21.733	167.2	15	85.717	82.740	2.602	Open Manhole	1350
2.004	38.449	74.0	16	85.105	82.220	2.510	Open Manhole	1500
2.005	38.095	45.1	17	84.900	81.300	3.150	Open Manhole	2400
1.010	22.389	392.8	18	85.069	79.090	4.779	Open Manhole	2400
1.011	19.251	395.0	19	84.870	79.041	4.629	Open Manhole	2400
1.012	18.669	395.0	21	84.972	78.994	4.778	Open Manhole	2400

Robert E Fry & Associates		Page 14
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
3.000	o	300	20	85.232	82.000	2.932	Open Manhole	1350
1.013	o	1200	21	84.972	78.994	4.778	Open Manhole	2400
1.014	o	1200	22	84.760	78.958	4.602	Open Manhole	2400
1.015	o	1200	23	84.470	78.918	4.352	Open Manhole	2400
1.016	o	1200	24	84.137	78.837	4.100	Open Manhole	2400
4.000	o	225	25	85.400	83.220	1.955	Open Manhole	1200
4.001	o	225	26	85.200	82.979	1.996	Open Manhole	1200
4.002	o	300	27	84.850	82.595	1.955	Open Manhole	1350
4.003	o	300	28	84.850	82.411	2.139	Open Manhole	1350
5.000	o	225	29	84.900	83.200	1.475	Open Manhole	1200
4.004	o	300	30	84.600	82.120	2.180	Open Manhole	1350
6.000	o	225	31	84.780	82.600	1.955	Open Manhole	1200
6.001	o	300	32	84.400	82.145	1.955	Open Manhole	1350
4.005	o	375	33	84.050	81.645	2.030	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.000	34.854	90.0	21	84.972	81.613	3.059	Open Manhole	2400
1.013	14.096	395.0	22	84.760	78.958	4.602	Open Manhole	2400
1.014	16.103	395.0	23	84.470	78.918	4.352	Open Manhole	2400
1.015	31.802	395.0	24	84.137	78.837	4.100	Open Manhole	2400
1.016	45.351	395.0	34	83.100	78.722	3.178	Open Manhole	2400
4.000	24.130	100.1	26	85.200	82.979	1.996	Open Manhole	1200
4.001	14.878	48.2	27	84.850	82.670	1.955	Open Manhole	1350
4.002	30.730	167.0	28	84.850	82.411	2.139	Open Manhole	1350
4.003	36.041	123.8	30	84.600	82.120	2.180	Open Manhole	1350
5.000	25.956	25.8	30	84.600	82.195	2.180	Open Manhole	1350
4.004	47.091	117.7	33	84.050	81.720	2.030	Open Manhole	1350
6.000	36.364	95.7	32	84.400	82.220	1.955	Open Manhole	1350
6.001	26.218	61.7	33	84.050	81.720	2.030	Open Manhole	1350
4.005	58.279	61.3	34	83.100	80.694	2.031	Open Manhole	2400

Robert E Fry & Associates		Page 15
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
1.017	o	1200	34	83.100	78.722	3.178	Open Manhole	2400
1.018	o	1200	35	82.570	78.624	2.746	Open Manhole	2400
7.000	o	225	36	84.000	82.300	1.475	Open Manhole	1200
7.001	o	300	37	84.300	81.900	2.100	Open Manhole	1350
7.002	o	300	38	84.120	81.587	2.233	Open Manhole	1350
7.003	o	300	39	83.820	81.439	2.081	Open Manhole	1350
7.004	o	375	40	83.829	81.294	2.160	Open Manhole	1350
7.005	o	375	41	83.462	81.202	1.885	Open Manhole	1350
7.006	o	375	42	83.300	81.058	1.867	Open Manhole	1350
8.000	o	300	43	82.701	80.820	1.581	Open Manhole	1350
8.001	o	300	44	83.100	80.580	2.220	Open Manhole	1350
9.000	o	225	45	83.400	81.072	2.103	Open Manhole	1200
9.001	o	300	46	83.300	80.672	2.328	Open Manhole	1350
8.002	o	300	47	83.200	80.361	2.539	Open Manhole	1350
8.003	o	375	48	83.060	80.150	2.535	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.017	38.798	395.9	35	82.570	78.624	2.746	Open Manhole	2400
1.018	13.697	390.0	68	82.446	78.589	2.657	Open Manhole	2400
7.000	29.886	92.0	37	84.300	81.975	2.100	Open Manhole	1350
7.001	28.527	91.0	38	84.120	81.587	2.233	Open Manhole	1350
7.002	24.612	167.0	39	83.820	81.439	2.081	Open Manhole	1350
7.003	11.687	167.0	40	83.829	81.369	2.160	Open Manhole	1350
7.004	15.404	167.4	41	83.462	81.202	1.885	Open Manhole	1350
7.005	13.001	90.0	42	83.300	81.058	1.867	Open Manhole	1350
7.006	13.172	90.0	49	83.113	80.911	1.827	Open Manhole	2400
8.000	36.765	153.2	44	83.100	80.580	2.220	Open Manhole	1350
8.001	35.046	160.0	47	83.200	80.361	2.539	Open Manhole	1350
9.000	32.529	100.1	46	83.300	80.747	2.328	Open Manhole	1350
9.001	31.073	99.9	47	83.200	80.361	2.539	Open Manhole	1350
8.002	22.691	167.0	48	83.060	80.225	2.535	Open Manhole	1350
8.003	23.158	108.2	49	83.113	79.936	2.802	Open Manhole	2400

Robert E Fry & Associates		Page 16
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
7.007	o	1200	49	83.113	79.111	2.802	Open Manhole	2400
7.008	o	1200	50	82.900	79.053	2.647	Open Manhole	2400
10.000	o	225	51	82.637	80.822	1.590	Open Manhole	1200
10.001	o	300	52	82.750	80.471	1.979	Open Manhole	1350
7.009	o	1200	53	82.720	79.021	2.499	Open Manhole	2400
7.010	o	1200	54	82.400	78.908	2.292	Open Manhole	2400
11.000	o	225	55	82.382	80.660	1.497	Open Manhole	1200
11.001	o	225	56	82.514	80.482	1.807	Open Manhole	1200
11.002	o	1200	57	82.696	79.310	2.186	Open Manhole	2400
11.003	o	1200	58	82.833	79.273	2.360	Open Manhole	2400
11.004	o	1200	59	82.987	79.241	2.546	Open Manhole	2400
11.005	o	1200	60	83.107	79.214	2.693	Open Manhole	2400
11.006	o	1200	61	83.319	79.163	2.956	Open Manhole	2400
11.007	o	1200	62	83.463	79.132	3.131	Open Manhole	2400
11.008	o	1200	63	83.574	79.103	3.271	Open Manhole	2400
11.009	o	1200	64	83.278	79.005	3.073	Open Manhole	2400
11.010	o	1200	65	82.763	78.903	2.660	Open Manhole	2400

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)
7.007	22.910	395.0	50	82.900	79.053	2.647	Open Manhole	2400
7.008	12.480	395.0	53	82.720	79.021	2.499	Open Manhole	2400
10.000	27.601	100.0	52	82.750	80.546	1.979	Open Manhole	1350
10.001	25.137	45.7	53	82.720	79.921	2.499	Open Manhole	2400
7.009	43.925	390.0	54	82.400	78.908	2.292	Open Manhole	2400
7.010	19.221	337.9	66	82.575	78.851	2.524	Open Manhole	2400
11.000	17.753	99.7	56	82.514	80.482	1.807	Open Manhole	1200
11.001	16.318	82.8	57	82.696	80.285	2.186	Open Manhole	2400
11.002	14.406	389.4	58	82.833	79.273	2.360	Open Manhole	2400
11.003	12.395	390.0	59	82.987	79.241	2.546	Open Manhole	2400
11.004	10.707	390.0	60	83.107	79.214	2.693	Open Manhole	2400
11.005	19.729	390.0	61	83.319	79.163	2.956	Open Manhole	2400
11.006	12.354	390.0	62	83.463	79.132	3.132	Open Manhole	2400
11.007	11.151	390.0	63	83.574	79.103	3.271	Open Manhole	2400
11.008	38.204	390.0	64	83.278	79.005	3.073	Open Manhole	2400
11.009	39.897	390.0	65	82.763	78.903	2.660	Open Manhole	2400
11.010	19.955	390.0	66	82.575	78.851	2.524	Open Manhole	2400

Robert E Fry & Associates		Page 17
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
7.011	o	1200	66	82.575	78.851	2.524	Open Manhole	2400
7.012	o	1200	67	82.695	78.818	2.677	Open Manhole	2400
1.019	o	1200	68	82.446	78.589	2.657	Open Manhole	2400
12.000	o	225	69	81.758	80.300	1.233	Open Manhole	1200
1.020	o	375	70	82.346	78.562	3.409	Open Manhole	2400
1.021	o	1200	71	82.245	77.680	3.365	Open Manhole	2400
1.022	o	1200	72	81.139	77.530	2.409	Open Manhole	2400
13.000	o	1200	73	81.900	78.028	2.672	Open Manhole	2400
13.001	o	1200	74	81.000	77.909	1.891	Open Manhole	2400
13.002	o	1200	75	80.877	77.847	1.830	Open Manhole	2400
14.000	o	1200	76	82.800	77.932	3.668	Open Manhole	2400
14.001	o	1200	77	82.600	77.873	3.527	Open Manhole	2400
13.003	o	1200	78	81.300	77.802	2.298	Open Manhole	2400
13.004	o	1200	79	80.787	77.744	1.843	Open Manhole	2400
13.005	o	1200	80	80.555	77.693	1.662	Open Manhole	2400

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)
7.011	13.047	395.4	67	82.695	78.818	2.677	Open Manhole	2400
7.012	62.951	274.5	68	82.446	78.589	2.657	Open Manhole	2400
1.019	10.664	395.0	70	82.346	78.562	2.584	Open Manhole	2400
12.000	33.506	43.9	70	82.346	79.537	2.584	Open Manhole	2400
1.020	11.319	200.0	71	82.245	78.505	3.365	Open Manhole	2400
1.021	60.053	400.4	72	81.139	77.530	2.409	Open Manhole	2400
1.022	33.191	399.9	86	80.050	77.447	1.403	Open Manhole	2400
13.000	46.552	391.2	74	81.000	77.909	1.891	Open Manhole	2400
13.001	24.124	390.0	75	80.877	77.847	1.830	Open Manhole	2400
13.002	17.748	390.0	78	81.300	77.802	2.298	Open Manhole	2400
14.000	22.846	390.0	77	82.600	77.873	3.527	Open Manhole	2400
14.001	27.665	385.4	78	81.300	77.802	2.298	Open Manhole	2400
13.003	22.375	390.0	79	80.787	77.744	1.843	Open Manhole	2400
13.004	20.064	390.0	80	80.555	77.693	1.662	Open Manhole	2400
13.005	16.695	390.0	83	80.400	77.650	1.550	Open Manhole	2400

Robert E Fry & Associates		Page 18
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
15.000	o	225	81	80.750	79.350	1.175	Open Manhole	1200
15.001	o	300	82	80.900	78.942	1.658	Open Manhole	1350
13.006	o	1200	83	80.400	77.650	1.550	Open Manhole	2400
13.007	o	1200	84	80.180	77.606	1.374	Open Manhole	2400
13.008	o	1200	85	80.050	77.499	1.351	Open Manhole	2400
1.023	o	1200	86	80.050	77.447	1.403	Open Manhole	2400
1.024	o	1200	87	80.305	77.408	1.697	Open Manhole	2400
16.000	o	225	88	83.887	82.050	1.612	Open Manhole	1200
16.001	o	225	89	83.170	81.333	1.612	Open Manhole	1200
17.000	o	225	90	83.100	81.618	1.257	Open Manhole	1200
16.002	o	300	91	82.380	80.823	1.257	Open Manhole	1350
16.003	o	375	92	81.572	79.940	1.257	Open Manhole	1350
16.004	o	375	93	81.225	79.593	1.257	Open Manhole	1350
16.005	o	375	94	80.600	78.968	1.257	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
15.000	33.284	100.0	82	80.900	79.017	1.658	Open Manhole	1350
15.001	30.381	77.5	83	80.400	78.550	1.550	Open Manhole	2400
13.006	17.572	400.0	84	80.180	77.606	1.374	Open Manhole	2400
13.007	42.768	399.7	85	80.050	77.499	1.351	Open Manhole	2400
13.008	12.226	235.1	86	80.050	77.447	1.403	Open Manhole	2400
1.023	15.311	392.6	87	80.305	77.408	1.697	Open Manhole	2400
1.024	14.790	395.0	101	80.500	77.371	1.929	Open Manhole	2400
16.000	35.906	50.1	89	83.170	81.333	1.612	Open Manhole	1200
16.001	21.769	50.0	91	82.380	80.898	1.257	Open Manhole	1350
17.000	29.030	40.3	91	82.380	80.898	1.257	Open Manhole	1350
16.002	41.779	51.7	92	81.572	80.015	1.257	Open Manhole	1350
16.003	19.907	57.4	93	81.225	79.593	1.257	Open Manhole	1350
16.004	25.857	41.4	94	80.600	78.968	1.257	Open Manhole	1350
16.005	24.376	42.0	98	80.200	78.387	1.438	Open Manhole	2400

Robert E Fry & Associates		Page 19
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
18.000	o	225	95	80.600	79.200	1.175	Open Manhole	1200
18.001	o	225	96	80.350	78.950	1.175	Open Manhole	1200
18.002	o	300	97	80.100	78.625	1.175	Open Manhole	1350
16.006	o	1200	98	80.200	77.562	1.438	Open Manhole	2400
16.007	o	1200	99	80.300	77.525	1.575	Open Manhole	2400
16.008	o	1200	100	80.400	77.493	1.707	Open Manhole	2400
1.025	o	1200	101	80.500	77.371	1.929	Open Manhole	2400
1.026	o	1200	102	80.300	77.303	1.797	Open Manhole	2400
1.027	o	1200	103	80.100	77.263	1.637	Open Manhole	2400
19.000	o	1200	104	80.300	77.432	1.668	Open Manhole	2400
19.001	o	1200	105	80.000	77.358	1.442	Open Manhole	2400
19.002	o	1200	106	79.800	77.302	1.298	Open Manhole	2400
19.003	o	1200	107	80.000	77.262	1.538	Open Manhole	2400
1.028	o	1200	108	80.200	77.226	1.774	Open Manhole	2400
1.029	o	1200	109	80.500	77.099	2.201	Open Manhole	2400
1.030	o	375	110	81.352	77.014	3.963	Open Manhole	2400
1.031	o	375	111	81.712	76.983	4.354	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
18.000	14.243	57.0	96	80.350	78.950	1.175	Open Manhole	1200
18.001	20.739	83.0	97	80.100	78.700	1.175	Open Manhole	1350
18.002	18.220	111.8	98	80.200	78.462	1.438	Open Manhole	2400
16.006	14.277	390.0	99	80.300	77.525	1.575	Open Manhole	2400
16.007	12.442	390.0	100	80.400	77.493	1.707	Open Manhole	2400
16.008	9.038	73.5	101	80.500	77.371	1.929	Open Manhole	2400
1.025	26.522	390.0	102	80.300	77.303	1.797	Open Manhole	2400
1.026	15.482	390.0	103	80.100	77.263	1.637	Open Manhole	2400
1.027	14.180	390.0	108	80.200	77.226	1.774	Open Manhole	2400
19.000	28.860	390.0	105	80.000	77.358	1.442	Open Manhole	2400
19.001	21.696	390.0	106	79.800	77.302	1.298	Open Manhole	2400
19.002	15.646	390.0	107	80.000	77.262	1.538	Open Manhole	2400
19.003	14.121	390.0	108	80.200	77.226	1.774	Open Manhole	2400
1.028	49.551	390.0	109	80.500	77.099	2.201	Open Manhole	2400
1.029	33.081	390.0	110	81.352	77.014	3.138	Open Manhole	2400
1.030	7.825	252.4	111	81.712	76.983	4.354	Open Manhole	1350
1.031	78.545	295.3	112	79.409	76.717	2.317	Open Manhole	1350

Robert E Fry & Associates		Page 20
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

PIPELINE SCHEDULES for SW1.SWS

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)
1.032	o	375	112	79.409	76.717	2.317	Open Manhole	1350
1.033	o	375	113	77.675	75.389	1.911	Open Manhole	1350
1.034	o	375	114	77.118	74.742	2.001	Open Manhole	1350
1.035	o	375	115	76.561	74.212	1.974	Open Manhole	1350
1.036	o	375	116	70.515	68.000	2.140	Open Manhole	1350
1.037	o	375	117	67.350	64.835	2.140	Open Manhole	1350
1.038	o	375	118	63.019	60.550	2.094	Open Manhole	1350
1.039	o	375	119	60.226	57.686	2.165	Open Manhole	1350
1.040	o	375	120	54.895	51.835	2.685	Open Manhole	1350
1.041	o	375	121	47.501	45.500	1.626	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.032	89.179	67.2	113	77.675	75.389	1.911	Open Manhole	1350
1.033	97.098	150.1	114	77.118	74.742	2.001	Open Manhole	1350
1.034	79.691	150.4	115	76.561	74.212	1.974	Open Manhole	1350
1.035	99.821	16.1	116	70.515	68.000	2.140	Open Manhole	1350
1.036	27.302	8.6	117	67.350	64.835	2.140	Open Manhole	1350
1.037	41.620	9.7	118	63.019	60.550	2.094	Open Manhole	1350
1.038	25.596	8.9	119	60.226	57.686	2.165	Open Manhole	1350
1.039	49.884	8.5	120	54.895	51.835	2.685	Open Manhole	1350
1.040	72.446	11.4	121	47.501	45.500	1.626	Open Manhole	1350
1.041	2.616	436.0	122	47.562	45.494	1.693	Open Manhole	0

Free Flowing Outfall Details for SW1.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.041	122	47.562	45.494	0.000	0	0

Simulation Criteria for SW1.SWS

Volumetric Runoff Coeff	0.750	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)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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 2 Number of Real Time Controls 0

Robert E Fry & Associates		Page 21
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Simulation Criteria for SW1.SWS

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	17.000	Storm Duration (mins)	30
Ratio R	0.300		

Robert E Fry & Associates		Page 22
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Online Controls for SW1.SWS

Hydro-Brake® Optimum Manhole: 70, DS/PN: 1.020, Volume (m³): 27.7

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)	78.562
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	55.0	Kick-Flo®	1.081	47.0
Flush-Flo™	0.518	55.0	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)	Depth (m)	Flow (l/s)
0.100	9.2	0.800	53.4	2.000	63.2	4.000	88.4	7.000	116.2
0.200	30.9	1.000	50.0	2.200	66.2	4.500	93.6	7.500	120.1
0.300	52.3	1.200	49.4	2.400	69.0	5.000	98.6	8.000	124.0
0.400	54.4	1.400	53.2	2.600	71.7	5.500	103.3	8.500	127.7
0.500	55.0	1.600	56.7	3.000	76.9	6.000	107.7	9.000	131.3
0.600	54.8	1.800	60.0	3.500	82.9	6.500	112.0	9.500	134.8

Hydro-Brake® Optimum Manhole: 110, DS/PN: 1.030, Volume (m³): 54.3

Unit Reference	MD-SHE-0308-6730-2900-6730
Design Head (m)	2.900
Design Flow (l/s)	67.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	308
Invert Level (m)	77.014
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.900	67.3	Kick-Flo®	1.807	53.6
Flush-Flo™	0.841	67.2	Mean Flow over Head Range	-	58.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake®

Robert E Fry & Associates		Page 23
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Hydro-Brake® Optimum Manhole: 110, DS/PN: 1.030, Volume (m³): 54.3

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	9.3	0.800	67.1	2.000	56.3	4.000	78.7	7.000	103.3
0.200	31.6	1.000	66.8	2.200	58.9	4.500	83.3	7.500	106.8
0.300	54.4	1.200	65.7	2.400	61.4	5.000	87.7	8.000	110.2
0.400	61.3	1.400	63.7	2.600	63.8	5.500	91.8	8.500	113.5
0.500	64.1	1.600	60.3	3.000	68.4	6.000	95.8	9.000	116.7
0.600	65.9	1.800	54.0	3.500	73.7	6.500	99.6	9.500	119.9

Robert E Fry & Associates		Page 24
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

Storage Structures for SW1.SWS

Tank or Pond Manhole: 70, DS/PN: 1.020

Invert Level (m) 80.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	896.0	1.546	1683.0

Tank or Pond Manhole: 110, DS/PN: 1.030

Invert Level (m) 78.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	768.0	2.552	1430.0

Robert E Fry & Associates		Page 25
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

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 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.300 Cv (Winter) 0.840

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) 100
 Climate Change (%) 30

								Water	Surcharged	Flooded
PN	US/MH	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Level (m)	Depth (m)	Volume (m³)
1.000	1	15 Winter	100	+30%	100/15 Summer			85.174	0.246	0.000
1.001	2	15 Winter	100	+30%	100/15 Summer			85.084	0.336	0.000
1.002	3	15 Winter	100	+30%	100/15 Summer			84.859	0.232	0.000
1.003	4	15 Winter	100	+30%				84.555	-0.020	0.000
1.004	5	15 Winter	100	+30%	100/15 Summer			84.079	0.080	0.000
1.005	6	15 Winter	100	+30%				83.497	-0.107	0.000
1.006	7	15 Winter	100	+30%	100/15 Summer			83.356	0.131	0.000
1.007	8	15 Winter	100	+30%	100/15 Summer			83.257	0.108	0.000
1.008	9	15 Winter	100	+30%	100/15 Summer			83.156	0.099	0.000
1.009	10	15 Winter	100	+30%	100/15 Summer			83.051	0.053	0.000
2.000	11	15 Winter	100	+30%				84.117	-0.139	0.000
2.001	12	15 Winter	100	+30%				83.683	-0.067	0.000
2.002	13	15 Winter	100	+30%				83.348	-0.008	0.000
2.003	14	15 Winter	100	+30%				83.117	-0.128	0.000
2.004	15	15 Winter	100	+30%				82.975	-0.140	0.000
2.005	16	15 Winter	100	+30%				82.347	-0.249	0.000
1.010	17	240 Winter	100	+30%	100/15 Winter			81.502	1.155	0.000
1.011	18	240 Winter	100	+30%	100/15 Winter			81.501	1.211	0.000
1.012	19	240 Winter	100	+30%	100/15 Winter			81.500	1.259	0.000
3.000	20	15 Winter	100	+30%				82.140	-0.160	0.000
1.013	21	240 Winter	100	+30%	100/15 Winter			81.499	1.305	0.000
1.014	22	240 Winter	100	+30%	100/15 Winter			81.498	1.340	0.000
1.015	23	240 Winter	100	+30%	100/15 Summer			81.497	1.380	0.000

Robert E Fry & Associates		Page 26
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
				Flow (l/s)		
1.000	1	0.72		28.1	SURCHARGED	
1.001	2	1.35		51.3	SURCHARGED	
1.002	3	2.34		74.8	SURCHARGED	
1.003	4	0.91		95.5	OK	
1.004	5	1.10		113.1	SURCHARGED	
1.005	6	0.62		130.2	OK	
1.006	7	0.88		146.6	SURCHARGED	
1.007	8	0.97		162.1	SURCHARGED	
1.008	9	1.15		179.4	SURCHARGED	
1.009	10	1.29		197.7	SURCHARGED	
2.000	11	0.31		24.0	OK	
2.001	12	0.82		50.2	OK	
2.002	13	1.00		74.1	OK	
2.003	14	0.75		98.8	OK	
2.004	15	0.69		146.2	OK	
2.005	16	0.40		170.8	OK	
1.010	17	0.08		109.4	SURCHARGED	
1.011	18	0.09		114.0	SURCHARGED	
1.012	19	0.10		117.6	SURCHARGED	
3.000	20	0.43		46.9	OK	
1.013	21	0.13		132.4	SURCHARGED	
1.014	22	0.13		136.7	SURCHARGED	
1.015	23	0.10		141.3	SURCHARGED	

Robert E Fry & Associates		Page 27
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.016	24	240 Winter	100	+30%	100/15 Summer				81.496	1.459
4.000	25	15 Winter	100	+30%					83.334	-0.111
4.001	26	15 Winter	100	+30%					83.181	-0.023
4.002	27	15 Winter	100	+30%	100/15 Summer				83.058	0.162
4.003	28	15 Winter	100	+30%	100/15 Summer				82.942	0.231
5.000	29	15 Winter	100	+30%					83.277	-0.148
4.004	30	15 Winter	100	+30%	100/15 Summer				82.699	0.279
6.000	31	15 Winter	100	+30%					82.710	-0.115
6.001	32	15 Winter	100	+30%					82.276	-0.169
4.005	33	15 Winter	100	+30%					81.898	-0.122
1.017	34	240 Winter	100	+30%	100/15 Summer				81.495	1.573
1.018	35	240 Winter	100	+30%	100/15 Summer				81.493	1.669
7.000	36	15 Winter	100	+30%					82.410	-0.115
7.001	37	15 Winter	100	+30%					82.047	-0.153
7.002	38	15 Winter	100	+30%	100/15 Summer				81.935	0.048
7.003	39	15 Winter	100	+30%	100/15 Summer				81.802	0.063
7.004	40	15 Winter	100	+30%					81.651	-0.018
7.005	41	15 Winter	100	+30%					81.562	-0.015
7.006	42	240 Winter	100	+30%	100/15 Winter				81.498	0.065
8.000	43	240 Winter	100	+30%	100/60 Winter				81.507	0.387
8.001	44	240 Winter	100	+30%	100/30 Summer				81.506	0.626
9.000	45	240 Winter	100	+30%	100/60 Winter				81.508	0.211
9.001	46	240 Winter	100	+30%	100/30 Winter				81.506	0.534
8.002	47	240 Winter	100	+30%	100/15 Summer				81.503	0.842
8.003	48	240 Winter	100	+30%	100/30 Summer				81.499	0.974
7.007	49	240 Winter	100	+30%	100/15 Winter				81.495	1.184
7.008	50	240 Winter	100	+30%	100/15 Winter				81.495	1.242
10.000	51	240 Winter	100	+30%	100/60 Summer				81.498	0.451
10.001	52	240 Winter	100	+30%	100/30 Summer				81.496	0.725
7.009	53	240 Winter	100	+30%	100/15 Winter				81.494	1.273
7.010	54	240 Winter	100	+30%	100/15 Summer				81.495	1.386
11.000	55	240 Winter	100	+30%	100/30 Winter				81.499	0.614
11.001	56	240 Winter	100	+30%	100/30 Summer				81.497	0.790
11.002	57	240 Winter	100	+30%	100/30 Summer				81.493	0.983
11.003	58	240 Winter	100	+30%	100/30 Summer				81.493	1.020
11.004	59	240 Winter	100	+30%	100/30 Summer				81.493	1.052
11.005	60	240 Winter	100	+30%	100/30 Summer				81.493	1.080
11.006	61	240 Winter	100	+30%	100/15 Winter				81.493	1.130
11.007	62	240 Winter	100	+30%	100/15 Winter				81.494	1.162
11.008	63	240 Winter	100	+30%	100/15 Winter				81.494	1.191
11.009	64	240 Winter	100	+30%	100/15 Winter				81.494	1.289
11.010	65	240 Winter	100	+30%	100/15 Summer				81.494	1.391
7.011	66	240 Winter	100	+30%	100/15 Summer				81.494	1.443
7.012	67	240 Winter	100	+30%	100/15 Summer				81.493	1.475
1.019	68	240 Winter	100	+30%	100/15 Summer				81.491	1.702
12.000	69	240 Winter	100	+30%	100/30 Summer				81.492	0.967
1.020	70	240 Winter	100	+30%	100/15 Summer				81.489	2.552
1.021	71	720 Winter	100	+30%	100/120 Summer				79.489	0.609
1.022	72	720 Winter	100	+30%	100/60 Winter				79.486	0.756

Robert E Fry & Associates		Page 28
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
1.016	24	0.000	0.09		145.9	SURCHARGED	
4.000	25	0.000	0.50		23.7	OK	
4.001	26	0.000	0.75		49.5	OK	
4.002	27	0.000	0.87		68.2	SURCHARGED	
4.003	28	0.000	0.90		83.2	SURCHARGED	
5.000	29	0.000	0.25		24.0	OK	
4.004	30	0.000	1.29		123.7	SURCHARGED	
6.000	31	0.000	0.47		23.4	OK	
6.001	32	0.000	0.39		49.5	OK	
4.005	33	0.000	0.78		186.4	OK	
1.017	34	0.000	0.13		201.2	SURCHARGED	
1.018	35	0.000	0.21		205.7	SURCHARGED	
7.000	36	0.000	0.47		23.6	OK	
7.001	37	0.000	0.47		49.3	OK	
7.002	38	0.000	0.94		71.9	SURCHARGED	
7.003	39	0.000	1.43		94.8	SURCHARGED	
7.004	40	0.000	0.97		115.4	OK	
7.005	41	0.000	0.91		135.1	OK	
7.006	42	0.000	0.28		41.2	SURCHARGED	
8.000	43	0.000	0.07		5.6	SURCHARGED	
8.001	44	0.000	0.14		11.1	SURCHARGED	
9.000	45	0.000	0.12		5.7	SURCHARGED	
9.001	46	0.000	0.11		11.2	SURCHARGED	
8.002	47	0.000	0.35		26.6	SURCHARGED	
8.003	48	0.000	0.19		31.7	SURCHARGED	
7.007	49	0.000	0.05		71.8	SURCHARGED	
7.008	50	0.000	0.08		76.0	SURCHARGED	
10.000	51	0.000	0.12		5.6	SURCHARGED	
10.001	52	0.000	0.08		11.2	SURCHARGED	
7.009	53	0.000	0.06		89.7	SURCHARGED	
7.010	54	0.000	0.07		93.9	SURCHARGED	
11.000	55	0.000	0.12		5.5	SURCHARGED	
11.001	56	0.000	0.22		11.2	SURCHARGED	
11.002	57	0.000	0.01		14.3	SURCHARGED	
11.003	58	0.000	0.02		18.5	SURCHARGED	
11.004	59	0.000	0.03		22.7	SURCHARGED	
11.005	60	0.000	0.02		26.9	SURCHARGED	
11.006	61	0.000	0.03		31.1	SURCHARGED	
11.007	62	0.000	0.04		35.4	SURCHARGED	
11.008	63	0.000	0.03		39.6	SURCHARGED	
11.009	64	0.000	0.03		43.8	SURCHARGED	
11.010	65	0.000	0.04		48.0	SURCHARGED	
7.011	66	0.000	0.15		146.2	SURCHARGED	
7.012	67	0.000	0.08		150.1	SURCHARGED	
1.019	68	0.000	0.41		360.0	SURCHARGED	
12.000	69	0.000	0.07		5.3	FLOOD RISK	
1.020	70	0.000	0.64		67.9	SURCHARGED	
1.021	71	0.000	0.04		67.2	SURCHARGED	

Robert E Fry & Associates		Page 29
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap.	Flow / Overflow (l/s)	Flow (l/s)		
1.022	72	0.000	0.05		68.6	SURCHARGED	

Robert E Fry & Associates		Page 30
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
13.000	73	720 Winter	100	+30%	100/240 Winter				79.483	0.255
13.001	74	720 Winter	100	+30%	100/180 Winter				79.484	0.375
13.002	75	720 Winter	100	+30%	100/120 Winter				79.484	0.436
14.000	76	720 Winter	100	+30%	100/180 Winter				79.483	0.351
14.001	77	720 Winter	100	+30%	100/120 Winter				79.483	0.410
13.003	78	720 Winter	100	+30%	100/120 Winter				79.484	0.482
13.004	79	720 Winter	100	+30%	100/120 Summer				79.484	0.539
13.005	80	720 Winter	100	+30%	100/120 Summer				79.484	0.591
15.000	81	720 Winter	100	+30%					79.484	-0.091
15.001	82	720 Winter	100	+30%	100/240 Winter				79.484	0.242
13.006	83	720 Winter	100	+30%	100/120 Summer				79.484	0.634
13.007	84	720 Winter	100	+30%	100/60 Winter				79.484	0.678
13.008	85	720 Winter	100	+30%	100/60 Winter				79.484	0.785
1.023	86	720 Winter	100	+30%	100/60 Winter				79.484	0.837
1.024	87	720 Winter	100	+30%	100/60 Winter				79.482	0.874
16.000	88	15 Winter	100	+30%					82.142	-0.133
16.001	89	15 Winter	100	+30%					81.480	-0.078
17.000	90	15 Winter	100	+30%					81.705	-0.138
16.002	91	15 Winter	100	+30%					81.009	-0.114
16.003	92	15 Winter	100	+30%					80.144	-0.171
16.004	93	15 Winter	100	+30%					79.795	-0.173
16.005	94	720 Winter	100	+30%	100/360 Winter				79.480	0.137
18.000	95	720 Winter	100	+30%	100/480 Winter				79.481	0.056
18.001	96	720 Winter	100	+30%	100/180 Winter				79.481	0.306
18.002	97	720 Winter	100	+30%	100/120 Summer				79.480	0.555
16.006	98	720 Winter	100	+30%	100/60 Winter				79.479	0.717
16.007	99	720 Winter	100	+30%	100/60 Winter				79.479	0.754
16.008	100	720 Winter	100	+30%	100/60 Winter				79.479	0.786
1.025	101	720 Winter	100	+30%	100/60 Winter				79.479	0.909
1.026	102	720 Winter	100	+30%	100/60 Summer				79.477	0.974
1.027	103	720 Winter	100	+30%	100/60 Summer				79.474	1.011
19.000	104	720 Winter	100	+30%	100/60 Winter				79.472	0.840
19.001	105	720 Winter	100	+30%	100/60 Winter				79.472	0.914
19.002	106	720 Winter	100	+30%	100/60 Summer				79.472	0.969
19.003	107	720 Winter	100	+30%	100/60 Summer				79.472	1.010
1.028	108	720 Winter	100	+30%	100/60 Summer				79.472	1.046
1.029	109	720 Winter	100	+30%	100/60 Summer				79.469	1.170
1.030	110	720 Winter	100	+30%	100/15 Summer				79.466	2.077
1.031	111	720 Summer	100	+30%					77.195	-0.163
1.032	112	2880 Summer	100	+30%					76.854	-0.238
1.033	113	2880 Summer	100	+30%					75.560	-0.204
1.034	114	2880 Summer	100	+30%					74.914	-0.203
1.035	115	2160 Summer	100	+30%					74.305	-0.282
1.036	116	2880 Summer	100	+30%					68.083	-0.292
1.037	117	2880 Summer	100	+30%					64.919	-0.291
1.038	118	2880 Summer	100	+30%					60.634	-0.291
1.039	119	2880 Summer	100	+30%					57.767	-0.294
1.040	120	2880 Summer	100	+30%					51.921	-0.289
1.041	121	2880 Winter	100	+30%					45.754	-0.121

Robert E Fry & Associates		Page 31
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
13.000	73	0.000	0.00		1.9	SURCHARGED	
13.001	74	0.000	0.01		7.0	SURCHARGED	
13.002	75	0.000	0.01		10.5	SURCHARGED	
14.000	76	0.000	0.00		2.0	SURCHARGED	
14.001	77	0.000	0.00		3.8	SURCHARGED	
13.003	78	0.000	0.02		20.4	SURCHARGED	
13.004	79	0.000	0.02		23.6	SURCHARGED	
13.005	80	0.000	0.02		26.3	SURCHARGED	
15.000	81	0.000	0.05		2.6	OK	
15.001	82	0.000	0.05		5.2	SURCHARGED	
13.006	83	0.000	0.03		28.6	SURCHARGED	
13.007	84	0.000	0.02		30.8	SURCHARGED	
13.008	85	0.000	0.03		35.2	SURCHARGED	
1.023	86	0.000	0.08		83.5	SURCHARGED	
1.024	87	0.000	0.09		84.8	SURCHARGED	
16.000	88	0.000	0.34		23.7	OK	
16.001	89	0.000	0.74		49.9	OK	
17.000	90	0.000	0.31		23.9	OK	
16.002	91	0.000	0.68		98.8	OK	
16.003	92	0.000	0.56		124.2	OK	
16.004	93	0.000	0.55		149.2	OK	
16.005	94	0.000	0.07		18.5	SURCHARGED	
18.000	95	0.000	0.04		2.6	SURCHARGED	
18.001	96	0.000	0.10		5.2	SURCHARGED	
18.002	97	0.000	0.09		7.9	SURCHARGED	
16.006	98	0.000	0.03		28.0	SURCHARGED	
16.007	99	0.000	0.03		28.1	SURCHARGED	
16.008	100	0.000	0.01		29.4	SURCHARGED	
1.025	101	0.000	0.08		116.8	SURCHARGED	
1.026	102	0.000	0.11		118.7	SURCHARGED	
1.027	103	0.000	0.12		120.6	SURCHARGED	
19.000	104	0.000	0.00		2.4	SURCHARGED	
19.001	105	0.000	0.01		7.7	SURCHARGED	
19.002	106	0.000	0.01		12.4	SURCHARGED	
19.003	107	0.000	0.02		15.6	SURCHARGED	
1.028	108	0.000	0.08		128.4	SURCHARGED	
1.029	109	0.000	0.09		127.1	SURCHARGED	
1.030	110	0.000	0.77		67.1	SURCHARGED	
1.031	111	0.000	0.61		67.1	OK	
1.032	112	0.000	0.29		67.1	OK	
1.033	113	0.000	0.43		67.1	OK	
1.034	114	0.000	0.43		67.1	OK	
1.035	115	0.000	0.14		67.1	OK	
1.036	116	0.000	0.11		67.1	OK	
1.037	117	0.000	0.11		67.1	OK	
1.038	118	0.000	0.12		67.1	OK	
1.039	119	0.000	0.11		67.1	OK	
1.040	120	0.000	0.12		67.1	OK	

Robert E Fry & Associates		Page 32
45 Bridgeman Terrace Wigan WN1 1TT	GRESFORD ROAD LLAY SURFACE WATER DESIGN	
Date 15/06/2018 File SW1.MDX	Designed by GWH Checked by	
XP Solutions	Network 2017.1.2	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded	Flow / Overflow		Pipe	Status	Level
		Volume (m³)	Cap.	(l/s)	Flow (l/s)		Exceeded
1.041	121	0.000	0.79		67.1	OK	