


The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

For Demonstration Only  
STORM SEWER DESIGN by the Modified Rational Method

Not for submission  
Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.600
Ratio R	0.400	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

For Demonstration Only

Not for submission

For Demonstration Only

Not for submission

For Demonstration Only

Not for submission

For Demonstration Only  
Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SW01	107.550	3.350	Open Manhole	1500	1.000	104.200	300				
SW02	107.250	3.150	Open Manhole	1500	1.001	104.100	300	1.000	104.100	300	
SW09	107.220	2.020	Open Manhole	1500	2.000	105.200	300				
SW10	107.160	2.160	Open Manhole	1500	2.001	105.000	300	2.000	105.161	300	161
SW11	107.500	2.699	Open Manhole	1500	2.002	104.801	300	2.001	104.801	300	
SW03	107.365	3.828	Open Manhole	2100	1.002	103.537	600	1.001	103.865	300	28
								2.002	104.749	300	912
SW04	107.100	4.470	Open Manhole	3000	1.003	102.630	1500	1.002	103.488	600	
SW05	105.950	3.435	Open Manhole	3000	1.004	102.515	1500	1.003	102.515	1500	
SW06	105.450	2.999	Open Manhole	3000	1.005	102.451	1500	1.004	102.451	1500	
SW07	105.100	2.679	Open Manhole	3000	1.006	102.421	1500	1.005	102.421	1500	
SW08	104.800	2.474	Open Manhole	3000	1.007	102.326	225	1.006	102.326	1500	
	103.560	1.467	Open Manhole	1200		OUTFALL		1.007	102.093	225	

For Demonstration Only  
Not for submission

For Demonstration Only  
Not for submission

For Demonstration Only  
Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.067	0.067	0.067
1.001	-	-	100	0.090	0.090	0.090
2.000	-	-	100	0.075	0.075	0.075
2.001	-	-	100	0.071	0.071	0.071
2.002	-	-	100	0.044	0.044	0.044
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.118	0.118	0.118
1.004	-	-	100	0.060	0.060	0.060
1.005	-	-	100	0.061	0.061	0.061
1.006	-	-	100	0.009	0.009	0.009
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.595	0.595	0.595

For Demonstration Only

Surcharged Outfall Details for Storm

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

1.007                      103.560    102.093    102.065    1200    0

Datum (m) 101.990    Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.300	23	1.300	45	1.300	67	1.300	89	1.300	111	1.300
2	1.300	24	1.300	46	1.300	68	1.300	90	1.300	112	1.300
3	1.300	25	1.300	47	1.300	69	1.300	91	1.300	113	1.300
4	1.300	26	1.300	48	1.300	70	1.300	92	1.300	114	1.300
5	1.300	27	1.300	49	1.300	71	1.300	93	1.300	115	1.300
6	1.300	28	1.300	50	1.300	72	1.300	94	1.300	116	1.300
7	1.300	29	1.300	51	1.300	73	1.300	95	1.300	117	1.300
8	1.300	30	1.300	52	1.300	74	1.300	96	1.300	118	1.300
9	1.300	31	1.300	53	1.300	75	1.300	97	1.300	119	1.300
10	1.300	32	1.300	54	1.300	76	1.300	98	1.300	120	1.300
11	1.300	33	1.300	55	1.300	77	1.300	99	1.300	121	1.300
12	1.300	34	1.300	56	1.300	78	1.300	100	1.300	122	1.300
13	1.300	35	1.300	57	1.300	79	1.300	101	1.300	123	1.300
14	1.300	36	1.300	58	1.300	80	1.300	102	1.300	124	1.300
15	1.300	37	1.300	59	1.300	81	1.300	103	1.300	125	1.300
16	1.300	38	1.300	60	1.300	82	1.300	104	1.300	126	1.300
17	1.300	39	1.300	61	1.300	83	1.300	105	1.300	127	1.300
18	1.300	40	1.300	62	1.300	84	1.300	106	1.300	128	1.300
19	1.300	41	1.300	63	1.300	85	1.300	107	1.300	129	1.300
20	1.300	42	1.300	64	1.300	86	1.300	108	1.300	130	1.300
21	1.300	43	1.300	65	1.300	87	1.300	109	1.300	131	1.300
22	1.300	44	1.300	66	1.300	88	1.300	110	1.300	132	1.300

For Demonstration Only

1 Dale Street  
 Liverpool  
 L2 2ET



Date 07/08/2017 14:15  
 File 217-111 - sw network.mdx

Designed by VincentWilliams  
 Checked by

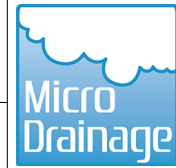
XP Solutions

Network 2016.1

Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
133	1.300	183	1.300	233	1.300	283	1.300	333	1.300	383	1.300
134	1.300	184	1.300	234	1.300	284	1.300	334	1.300	384	1.300
135	1.300	185	1.300	235	1.300	285	1.300	335	1.300	385	1.300
136	1.300	186	1.300	236	1.300	286	1.300	336	1.300	386	1.300
137	1.300	187	1.300	237	1.300	287	1.300	337	1.300	387	1.300
138	1.300	188	1.300	238	1.300	288	1.300	338	1.300	388	1.300
139	1.300	189	1.300	239	1.300	289	1.300	339	1.300	389	1.300
140	1.300	190	1.300	240	1.300	290	1.300	340	1.300	390	1.300
141	1.300	191	1.300	241	1.300	291	1.300	341	1.300	391	1.300
142	1.300	192	1.300	242	1.300	292	1.300	342	1.300	392	1.300
143	1.300	193	1.300	243	1.300	293	1.300	343	1.300	393	1.300
144	1.300	194	1.300	244	1.300	294	1.300	344	1.300	394	1.300
145	1.300	195	1.300	245	1.300	295	1.300	345	1.300	395	1.300
146	1.300	196	1.300	246	1.300	296	1.300	346	1.300	396	1.300
147	1.300	197	1.300	247	1.300	297	1.300	347	1.300	397	1.300
148	1.300	198	1.300	248	1.300	298	1.300	348	1.300	398	1.300
149	1.300	199	1.300	249	1.300	299	1.300	349	1.300	399	1.300
150	1.300	200	1.300	250	1.300	300	1.300	350	1.300	400	1.300
151	1.300	201	1.300	251	1.300	301	1.300	351	1.300	401	1.300
152	1.300	202	1.300	252	1.300	302	1.300	352	1.300	402	1.300
153	1.300	203	1.300	253	1.300	303	1.300	353	1.300	403	1.300
154	1.300	204	1.300	254	1.300	304	1.300	354	1.300	404	1.300
155	1.300	205	1.300	255	1.300	305	1.300	355	1.300	405	1.300
156	1.300	206	1.300	256	1.300	306	1.300	356	1.300	406	1.300
157	1.300	207	1.300	257	1.300	307	1.300	357	1.300	407	1.300
158	1.300	208	1.300	258	1.300	308	1.300	358	1.300	408	1.300
159	1.300	209	1.300	259	1.300	309	1.300	359	1.300	409	1.300
160	1.300	210	1.300	260	1.300	310	1.300	360	1.300	410	1.300
161	1.300	211	1.300	261	1.300	311	1.300	361	1.300	411	1.300
162	1.300	212	1.300	262	1.300	312	1.300	362	1.300	412	1.300
163	1.300	213	1.300	263	1.300	313	1.300	363	1.300	413	1.300
164	1.300	214	1.300	264	1.300	314	1.300	364	1.300	414	1.300
165	1.300	215	1.300	265	1.300	315	1.300	365	1.300	415	1.300
166	1.300	216	1.300	266	1.300	316	1.300	366	1.300	416	1.300
167	1.300	217	1.300	267	1.300	317	1.300	367	1.300	417	1.300
168	1.300	218	1.300	268	1.300	318	1.300	368	1.300	418	1.300
169	1.300	219	1.300	269	1.300	319	1.300	369	1.300	419	1.300
170	1.300	220	1.300	270	1.300	320	1.300	370	1.300	420	1.300
171	1.300	221	1.300	271	1.300	321	1.300	371	1.300	421	1.300
172	1.300	222	1.300	272	1.300	322	1.300	372	1.300	422	1.300
173	1.300	223	1.300	273	1.300	323	1.300	373	1.300	423	1.300
174	1.300	224	1.300	274	1.300	324	1.300	374	1.300	424	1.300
175	1.300	225	1.300	275	1.300	325	1.300	375	1.300	425	1.300
176	1.300	226	1.300	276	1.300	326	1.300	376	1.300	426	1.300
177	1.300	227	1.300	277	1.300	327	1.300	377	1.300	427	1.300
178	1.300	228	1.300	278	1.300	328	1.300	378	1.300	428	1.300
179	1.300	229	1.300	279	1.300	329	1.300	379	1.300	429	1.300
180	1.300	230	1.300	280	1.300	330	1.300	380	1.300	430	1.300
181	1.300	231	1.300	281	1.300	331	1.300	381	1.300	431	1.300
182	1.300	232	1.300	282	1.300	332	1.300	382	1.300	432	1.300

1 Dale Street  
 Liverpool  
 L2 2ET



Date 07/08/2017 14:15  
 File 217-111 - sw network.mdx

Designed by VincentWilliams  
 Checked by

XP Solutions

Network 2016.1

Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
433	1.300	483	1.300	533	1.300	583	1.300	633	1.300	683	1.300
434	1.300	484	1.300	534	1.300	584	1.300	634	1.300	684	1.300
435	1.300	485	1.300	535	1.300	585	1.300	635	1.300	685	1.300
436	1.300	486	1.300	536	1.300	586	1.300	636	1.300	686	1.300
437	1.300	487	1.300	537	1.300	587	1.300	637	1.300	687	1.300
438	1.300	488	1.300	538	1.300	588	1.300	638	1.300	688	1.300
439	1.300	489	1.300	539	1.300	589	1.300	639	1.300	689	1.300
440	1.300	490	1.300	540	1.300	590	1.300	640	1.300	690	1.300
441	1.300	491	1.300	541	1.300	591	1.300	641	1.300	691	1.300
442	1.300	492	1.300	542	1.300	592	1.300	642	1.300	692	1.300
443	1.300	493	1.300	543	1.300	593	1.300	643	1.300	693	1.300
444	1.300	494	1.300	544	1.300	594	1.300	644	1.300	694	1.300
445	1.300	495	1.300	545	1.300	595	1.300	645	1.300	695	1.300
446	1.300	496	1.300	546	1.300	596	1.300	646	1.300	696	1.300
447	1.300	497	1.300	547	1.300	597	1.300	647	1.300	697	1.300
448	1.300	498	1.300	548	1.300	598	1.300	648	1.300	698	1.300
449	1.300	499	1.300	549	1.300	599	1.300	649	1.300	699	1.300
450	1.300	500	1.300	550	1.300	600	1.300	650	1.300	700	1.300
451	1.300	501	1.300	551	1.300	601	1.300	651	1.300	701	1.300
452	1.300	502	1.300	552	1.300	602	1.300	652	1.300	702	1.300
453	1.300	503	1.300	553	1.300	603	1.300	653	1.300	703	1.300
454	1.300	504	1.300	554	1.300	604	1.300	654	1.300	704	1.300
455	1.300	505	1.300	555	1.300	605	1.300	655	1.300	705	1.300
456	1.300	506	1.300	556	1.300	606	1.300	656	1.300	706	1.300
457	1.300	507	1.300	557	1.300	607	1.300	657	1.300	707	1.300
458	1.300	508	1.300	558	1.300	608	1.300	658	1.300	708	1.300
459	1.300	509	1.300	559	1.300	609	1.300	659	1.300	709	1.300
460	1.300	510	1.300	560	1.300	610	1.300	660	1.300	710	1.300
461	1.300	511	1.300	561	1.300	611	1.300	661	1.300	711	1.300
462	1.300	512	1.300	562	1.300	612	1.300	662	1.300	712	1.300
463	1.300	513	1.300	563	1.300	613	1.300	663	1.300	713	1.300
464	1.300	514	1.300	564	1.300	614	1.300	664	1.300	714	1.300
465	1.300	515	1.300	565	1.300	615	1.300	665	1.300	715	1.300
466	1.300	516	1.300	566	1.300	616	1.300	666	1.300	716	1.300
467	1.300	517	1.300	567	1.300	617	1.300	667	1.300	717	1.300
468	1.300	518	1.300	568	1.300	618	1.300	668	1.300	718	1.300
469	1.300	519	1.300	569	1.300	619	1.300	669	1.300	719	1.300
470	1.300	520	1.300	570	1.300	620	1.300	670	1.300	720	1.300
471	1.300	521	1.300	571	1.300	621	1.300	671	1.300	721	1.300
472	1.300	522	1.300	572	1.300	622	1.300	672	1.300	722	1.300
473	1.300	523	1.300	573	1.300	623	1.300	673	1.300	723	1.300
474	1.300	524	1.300	574	1.300	624	1.300	674	1.300	724	1.300
475	1.300	525	1.300	575	1.300	625	1.300	675	1.300	725	1.300
476	1.300	526	1.300	576	1.300	626	1.300	676	1.300	726	1.300
477	1.300	527	1.300	577	1.300	627	1.300	677	1.300	727	1.300
478	1.300	528	1.300	578	1.300	628	1.300	678	1.300	728	1.300
479	1.300	529	1.300	579	1.300	629	1.300	679	1.300	729	1.300
480	1.300	530	1.300	580	1.300	630	1.300	680	1.300	730	1.300
481	1.300	531	1.300	581	1.300	631	1.300	681	1.300	731	1.300
482	1.300	532	1.300	582	1.300	632	1.300	682	1.300	732	1.300

1 Dale Street  
 Liverpool  
 L2 2ET



Date 07/08/2017 14:15

Designed by VincentWilliams

File 217-111 - sw network.mdx

Checked by

XP Solutions

Network 2016.1

**For Demonstration Only**  
Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
733	1.300	783	1.300	833	1.300	883	1.300	933	1.300	983	1.300
734	1.300	784	1.300	834	1.300	884	1.300	934	1.300	984	1.300
735	1.300	785	1.300	835	1.300	885	1.300	935	1.300	985	1.300
736	1.300	786	1.300	836	1.300	886	1.300	936	1.300	986	1.300
737	1.300	787	1.300	837	1.300	887	1.300	937	1.300	987	1.300
738	1.300	788	1.300	838	1.300	888	1.300	938	1.300	988	1.300
739	1.300	789	1.300	839	1.300	889	1.300	939	1.300	989	1.300
740	1.300	790	1.300	840	1.300	890	1.300	940	1.300	990	1.300
741	1.300	791	1.300	841	1.300	891	1.300	941	1.300	991	1.300
742	1.300	792	1.300	842	1.300	892	1.300	942	1.300	992	1.300
743	1.300	793	1.300	843	1.300	893	1.300	943	1.300	993	1.300
744	1.300	794	1.300	844	1.300	894	1.300	944	1.300	994	1.300
745	1.300	795	1.300	845	1.300	895	1.300	945	1.300	995	1.300
746	1.300	796	1.300	846	1.300	896	1.300	946	1.300	996	1.300
747	1.300	797	1.300	847	1.300	897	1.300	947	1.300	997	1.300
748	1.300	798	1.300	848	1.300	898	1.300	948	1.300	998	1.300
749	1.300	799	1.300	849	1.300	899	1.300	949	1.300	999	1.300
750	1.300	800	1.300	850	1.300	900	1.300	950	1.300	1000	1.300
751	1.300	801	1.300	851	1.300	901	1.300	951	1.300	1001	1.300
752	1.300	802	1.300	852	1.300	902	1.300	952	1.300	1002	1.300
753	1.300	803	1.300	853	1.300	903	1.300	953	1.300	1003	1.300
754	1.300	804	1.300	854	1.300	904	1.300	954	1.300	1004	1.300
755	1.300	805	1.300	855	1.300	905	1.300	955	1.300	1005	1.300
756	1.300	806	1.300	856	1.300	906	1.300	956	1.300	1006	1.300
757	1.300	807	1.300	857	1.300	907	1.300	957	1.300	1007	1.300
758	1.300	808	1.300	858	1.300	908	1.300	958	1.300	1008	1.300
759	1.300	809	1.300	859	1.300	909	1.300	959	1.300	1009	1.300
760	1.300	810	1.300	860	1.300	910	1.300	960	1.300	1010	1.300
761	1.300	811	1.300	861	1.300	911	1.300	961	1.300	1011	1.300
762	1.300	812	1.300	862	1.300	912	1.300	962	1.300	1012	1.300
763	1.300	813	1.300	863	1.300	913	1.300	963	1.300	1013	1.300
764	1.300	814	1.300	864	1.300	914	1.300	964	1.300	1014	1.300
765	1.300	815	1.300	865	1.300	915	1.300	965	1.300	1015	1.300
766	1.300	816	1.300	866	1.300	916	1.300	966	1.300	1016	1.300
767	1.300	817	1.300	867	1.300	917	1.300	967	1.300	1017	1.300
768	1.300	818	1.300	868	1.300	918	1.300	968	1.300	1018	1.300
769	1.300	819	1.300	869	1.300	919	1.300	969	1.300	1019	1.300
770	1.300	820	1.300	870	1.300	920	1.300	970	1.300	1020	1.300
771	1.300	821	1.300	871	1.300	921	1.300	971	1.300	1021	1.300
772	1.300	822	1.300	872	1.300	922	1.300	972	1.300	1022	1.300
773	1.300	823	1.300	873	1.300	923	1.300	973	1.300	1023	1.300
774	1.300	824	1.300	874	1.300	924	1.300	974	1.300	1024	1.300
775	1.300	825	1.300	875	1.300	925	1.300	975	1.300	1025	1.300
776	1.300	826	1.300	876	1.300	926	1.300	976	1.300	1026	1.300
777	1.300	827	1.300	877	1.300	927	1.300	977	1.300	1027	1.300
778	1.300	828	1.300	878	1.300	928	1.300	978	1.300	1028	1.300
779	1.300	829	1.300	879	1.300	929	1.300	979	1.300	1029	1.300
780	1.300	830	1.300	880	1.300	930	1.300	980	1.300	1030	1.300
781	1.300	831	1.300	881	1.300	931	1.300	981	1.300	1031	1.300
782	1.300	832	1.300	882	1.300	932	1.300	982	1.300	1032	1.300

1 Dale Street  
 Liverpool  
 L2 2ET



Date 07/08/2017 14:15  
 File 217-111 - sw network.mdx

Designed by VincentWilliams  
 Checked by

XP Solutions Network 2016.1

**For Demonstration Only**  
Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1033	1.300	1083	1.300	1133	1.300	1183	1.300	1233	1.300	1283	1.300
1034	1.300	1084	1.300	1134	1.300	1184	1.300	1234	1.300	1284	1.300
1035	1.300	1085	1.300	1135	1.300	1185	1.300	1235	1.300	1285	1.300
1036	1.300	1086	1.300	1136	1.300	1186	1.300	1236	1.300	1286	1.300
1037	1.300	1087	1.300	1137	1.300	1187	1.300	1237	1.300	1287	1.300
1038	1.300	1088	1.300	1138	1.300	1188	1.300	1238	1.300	1288	1.300
1039	1.300	1089	1.300	1139	1.300	1189	1.300	1239	1.300	1289	1.300
1040	1.300	1090	1.300	1140	1.300	1190	1.300	1240	1.300	1290	1.300
1041	1.300	1091	1.300	1141	1.300	1191	1.300	1241	1.300	1291	1.300
1042	1.300	1092	1.300	1142	1.300	1192	1.300	1242	1.300	1292	1.300
1043	1.300	1093	1.300	1143	1.300	1193	1.300	1243	1.300	1293	1.300
1044	1.300	1094	1.300	1144	1.300	1194	1.300	1244	1.300	1294	1.300
1045	1.300	1095	1.300	1145	1.300	1195	1.300	1245	1.300	1295	1.300
1046	1.300	1096	1.300	1146	1.300	1196	1.300	1246	1.300	1296	1.300
1047	1.300	1097	1.300	1147	1.300	1197	1.300	1247	1.300	1297	1.300
1048	1.300	1098	1.300	1148	1.300	1198	1.300	1248	1.300	1298	1.300
1049	1.300	1099	1.300	1149	1.300	1199	1.300	1249	1.300	1299	1.300
1050	1.300	1100	1.300	1150	1.300	1200	1.300	1250	1.300	1300	1.300
1051	1.300	1101	1.300	1151	1.300	1201	1.300	1251	1.300	1301	1.300
1052	1.300	1102	1.300	1152	1.300	1202	1.300	1252	1.300	1302	1.300
1053	1.300	1103	1.300	1153	1.300	1203	1.300	1253	1.300	1303	1.300
1054	1.300	1104	1.300	1154	1.300	1204	1.300	1254	1.300	1304	1.300
1055	1.300	1105	1.300	1155	1.300	1205	1.300	1255	1.300	1305	1.300
1056	1.300	1106	1.300	1156	1.300	1206	1.300	1256	1.300	1306	1.300
1057	1.300	1107	1.300	1157	1.300	1207	1.300	1257	1.300	1307	1.300
1058	1.300	1108	1.300	1158	1.300	1208	1.300	1258	1.300	1308	1.300
1059	1.300	1109	1.300	1159	1.300	1209	1.300	1259	1.300	1309	1.300
1060	1.300	1110	1.300	1160	1.300	1210	1.300	1260	1.300	1310	1.300
1061	1.300	1111	1.300	1161	1.300	1211	1.300	1261	1.300	1311	1.300
1062	1.300	1112	1.300	1162	1.300	1212	1.300	1262	1.300	1312	1.300
1063	1.300	1113	1.300	1163	1.300	1213	1.300	1263	1.300	1313	1.300
1064	1.300	1114	1.300	1164	1.300	1214	1.300	1264	1.300	1314	1.300
1065	1.300	1115	1.300	1165	1.300	1215	1.300	1265	1.300	1315	1.300
1066	1.300	1116	1.300	1166	1.300	1216	1.300	1266	1.300	1316	1.300
1067	1.300	1117	1.300	1167	1.300	1217	1.300	1267	1.300	1317	1.300
1068	1.300	1118	1.300	1168	1.300	1218	1.300	1268	1.300	1318	1.300
1069	1.300	1119	1.300	1169	1.300	1219	1.300	1269	1.300	1319	1.300
1070	1.300	1120	1.300	1170	1.300	1220	1.300	1270	1.300	1320	1.300
1071	1.300	1121	1.300	1171	1.300	1221	1.300	1271	1.300	1321	1.300
1072	1.300	1122	1.300	1172	1.300	1222	1.300	1272	1.300	1322	1.300
1073	1.300	1123	1.300	1173	1.300	1223	1.300	1273	1.300	1323	1.300
1074	1.300	1124	1.300	1174	1.300	1224	1.300	1274	1.300	1324	1.300
1075	1.300	1125	1.300	1175	1.300	1225	1.300	1275	1.300	1325	1.300
1076	1.300	1126	1.300	1176	1.300	1226	1.300	1276	1.300	1326	1.300
1077	1.300	1127	1.300	1177	1.300	1227	1.300	1277	1.300	1327	1.300
1078	1.300	1128	1.300	1178	1.300	1228	1.300	1278	1.300	1328	1.300
1079	1.300	1129	1.300	1179	1.300	1229	1.300	1279	1.300	1329	1.300
1080	1.300	1130	1.300	1180	1.300	1230	1.300	1280	1.300	1330	1.300
1081	1.300	1131	1.300	1181	1.300	1231	1.300	1281	1.300	1331	1.300
1082	1.300	1132	1.300	1182	1.300	1232	1.300	1282	1.300	1332	1.300

For Demonstration Only  
Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1333	1.300	1351	1.300	1369	1.300	1387	1.300	1405	1.300	1423	1.300
1334	1.300	1352	1.300	1370	1.300	1388	1.300	1406	1.300	1424	1.300
1335	1.300	1353	1.300	1371	1.300	1389	1.300	1407	1.300	1425	1.300
1336	1.300	1354	1.300	1372	1.300	1390	1.300	1408	1.300	1426	1.300
1337	1.300	1355	1.300	1373	1.300	1391	1.300	1409	1.300	1427	1.300
1338	1.300	1356	1.300	1374	1.300	1392	1.300	1410	1.300	1428	1.300
1339	1.300	1357	1.300	1375	1.300	1393	1.300	1411	1.300	1429	1.300
1340	1.300	1358	1.300	1376	1.300	1394	1.300	1412	1.300	1430	1.300
1341	1.300	1359	1.300	1377	1.300	1395	1.300	1413	1.300	1431	1.300
1342	1.300	1360	1.300	1378	1.300	1396	1.300	1414	1.300	1432	1.300
1343	1.300	1361	1.300	1379	1.300	1397	1.300	1415	1.300	1433	1.300
1344	1.300	1362	1.300	1380	1.300	1398	1.300	1416	1.300	1434	1.300
1345	1.300	1363	1.300	1381	1.300	1399	1.300	1417	1.300	1435	1.300
1346	1.300	1364	1.300	1382	1.300	1400	1.300	1418	1.300	1436	1.300
1347	1.300	1365	1.300	1383	1.300	1401	1.300	1419	1.300	1437	1.300
1348	1.300	1366	1.300	1384	1.300	1402	1.300	1420	1.300	1438	1.300
1349	1.300	1367	1.300	1385	1.300	1403	1.300	1421	1.300	1439	1.300
1350	1.300	1368	1.300	1386	1.300	1404	1.300	1422	1.300	1440	1.300

Simulation Criteria for Storm


Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /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 Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.400		

For Demonstration Only  
Not for submission



The Alan Johnston Partnership		Page 9
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

For Demonstration Only  
Not for submission

Online Controls for Storm

Hydro-Brake Optimum® Manhole: SW08, DS/PN: 1.007, Volume (m³): 79.3

Unit Reference MD-SHE-0103-5000-1200-5000  
 Design Head (m) 1.200  
 Design Flow (l/s) 5.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 103  
 Invert Level (m) 102.326  
 Minimum Outlet Pipe Diameter (mm) 150  
 Suggested Manhole Diameter (mm) 1200


**Control Points      Head (m)    Flow (l/s)**

Design Point (Calculated)    1.200      5.0  
 Flush-Flo™                      0.354      5.0  
 Kick-Flo®                        0.745      4.0  
 Mean Flow over Head Range    -            4.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	5.0	3.000	7.7	7.000	11.5
0.200	4.7	1.400	5.4	3.500	8.3	7.500	11.8
0.300	5.0	1.600	5.7	4.000	8.8	8.000	12.2
0.400	5.0	1.800	6.0	4.500	9.3	8.500	12.6
0.500	4.9	2.000	6.3	5.000	9.8	9.000	12.9
0.600	4.7	2.200	6.6	5.500	10.2	9.500	13.3
0.800	4.1	2.400	6.9	6.000	10.7		
1.000	4.6	2.600	7.2	6.500	11.1		

For Demonstration Only  
Not for submission

The Alan Johnston Partnership		Page 10
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

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

Not for submission

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 Storage Structures 0  
Number of Online Controls 1 Number of Time/Area Diagrams 0  
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 18.000 Cv (Winter) 0.840

Not for submission

Margin for Flood Risk Warning (mm) 100.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status ON  
DVD Status ON  
Inertia Status OFF

Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
Return Period(s) (years) 1, 2, 30, 100  
Climate Change (%) 0, 0, 0, 30


For Demonstration Only

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SW01	15 Winter	1	+0%	100/240 Winter			
1.001	SW02	15 Winter	1	+0%	100/15 Summer			
2.000	SW09	15 Winter	1	+0%				
2.001	SW10	15 Winter	1	+0%	100/15 Summer			
2.002	SW11	15 Winter	1	+0%	100/15 Summer			
1.002	SW03	15 Winter	1	+0%	100/120 Winter			
1.003	SW04	1440 Winter	1	+0%	100/120 Winter			
1.004	SW05	1440 Winter	1	+0%	100/120 Winter			
1.005	SW06	1440 Winter	1	+0%	100/120 Winter			
1.006	SW07	1440 Winter	1	+0%	100/120 Summer			
1.007	SW08	1440 Winter	1	+0%	1/15 Summer	100/240 Winter		

For Demonstration Only

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	104.270	-0.230	0.000	0.12	8.2	OK	
1.001	SW02	104.200	-0.200	0.000	0.24	17.7	OK	

Not for submission

The Alan Johnston Partnership		Page 11
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions		Network 2016.1

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

Not for submission

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	SW09	105.281	-0.219	0.000	0.16	9.3	OK	
2.001	SW10	105.098	-0.202	0.000	0.23	16.6	OK	
2.002	SW11	104.922	-0.179	0.000	0.34	20.8	OK	
1.002	SW03	103.679	-0.458	0.000	0.13	38.7	OK	
1.003	SW04	103.326	-0.804	0.000	0.00	3.3	OK	
1.004	SW05	103.326	-0.689	0.000	0.00	4.6	OK	
1.005	SW06	103.327	-0.624	0.000	0.00	7.3	OK	
1.006	SW07	103.327	-0.594	0.000	0.00	6.2	OK	
1.007	SW08	103.327	0.776	0.000	0.13	5.0	SURCHARGED	5


Not for submission

For Demonstration Only

Not for submission

For Demonstration Only

Not for submission

The Alan Johnston Partnership		Page 12
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

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

**Not for submission**

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 Storage Structures 0  
Number of Online Controls 1 Number of Time/Area Diagrams 0  
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 18.000 Cv (Winter) 0.840

**Not for submission**

Margin for Flood Risk Warning (mm) 100.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status ON  
DVD Status ON  
Inertia Status OFF


Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
Return Period(s) (years) 1, 2, 30, 100  
Climate Change (%) 0, 0, 0, 30

**For Demonstration Only**

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SW01	15 Winter	2	+0%	100/240 Winter			
1.001	SW02	15 Winter	2	+0%	100/15 Summer			
2.000	SW09	15 Winter	2	+0%				
2.001	SW10	15 Winter	2	+0%	100/15 Summer			
2.002	SW11	15 Winter	2	+0%	100/15 Summer			
1.002	SW03	15 Winter	2	+0%	100/120 Winter			
1.003	SW04	1440 Winter	2	+0%	100/120 Winter			
1.004	SW05	1440 Winter	2	+0%	100/120 Winter			
1.005	SW06	1440 Winter	2	+0%	100/120 Winter			
1.006	SW07	1440 Winter	2	+0%	100/120 Summer			
1.007	SW08	1440 Winter	2	+0%	1/15 Summer	100/240 Winter		

**For Demonstration Only**

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	104.280	-0.220	0.000	0.16	10.6	OK	
1.001	SW02	104.216	-0.185	0.000	0.31	22.9	OK	

The Alan Johnston Partnership		Page 13
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions		Network 2016.1

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

Not for submission

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Cap. (l/s)	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	SW09	105.293	-0.207	0.000	0.21		12.1	OK	
2.001	SW10	105.113	-0.187	0.000	0.30		21.5	OK	
2.002	SW11	104.941	-0.160	0.000	0.44		27.0	OK	
1.002	SW03	103.700	-0.437	0.000	0.16		50.0	OK	
1.003	SW04	103.359	-0.771	0.000	0.00		4.1	OK	
1.004	SW05	103.359	-0.656	0.000	0.00		4.6	OK	
1.005	SW06	103.359	-0.592	0.000	0.00		6.9	OK	
1.006	SW07	103.359	-0.562	0.000	0.00		6.4	OK	
1.007	SW08	103.359	0.808	0.000	0.13		5.0	SURCHARGED	5


Not for submission

For Demonstration Only

Not for submission

For Demonstration Only

Not for submission

The Alan Johnston Partnership		Page 14
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

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

Not for submission

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 Storage Structures 0  
Number of Online Controls 1 Number of Time/Area Diagrams 0  
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 18.000 Cv (Winter) 0.840

Not for submission

Margin for Flood Risk Warning (mm) 100.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status ON  
DVD Status ON  
Inertia Status OFF

Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
Return Period(s) (years) 1, 2, 30, 100  
Climate Change (%) 0, 0, 0, 30


For Demonstration Only

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SW01	15 Winter	30	+0%	100/240 Winter			
1.001	SW02	15 Winter	30	+0%	100/15 Summer			
2.000	SW09	15 Winter	30	+0%				
2.001	SW10	15 Winter	30	+0%	100/15 Summer			
2.002	SW11	15 Winter	30	+0%	100/15 Summer			
1.002	SW03	15 Winter	30	+0%	100/120 Winter			
1.003	SW04	960 Winter	30	+0%	100/120 Winter			
1.004	SW05	960 Winter	30	+0%	100/120 Winter			
1.005	SW06	960 Winter	30	+0%	100/120 Winter			
1.006	SW07	960 Winter	30	+0%	100/120 Summer			
1.007	SW08	960 Winter	30	+0%	1/15 Summer	100/240 Winter		

For Demonstration Only

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	104.325	-0.175	0.000	0.29	20.1	OK	
1.001	SW02	104.281	-0.119	0.000	0.67	49.1	OK	

Not for submission

The Alan Johnston Partnership		Page 15
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

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


Not for submission

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	SW09	105.331	-0.169	0.000	0.39	22.8	OK	
2.001	SW10	105.174	-0.126	0.000	0.61	44.3	OK	
2.002	SW11	105.032	-0.069	0.000	0.94	57.7	OK	
1.002	SW03	103.781	-0.356	0.000	0.35	106.7	OK	
1.003	SW04	103.600	-0.530	0.000	0.00	9.0	OK	
1.004	SW05	103.600	-0.415	0.000	0.00	7.1	OK	
1.005	SW06	103.599	-0.352	0.000	0.00	7.3	OK	
1.006	SW07	103.599	-0.322	0.000	0.00	6.4	OK	
1.007	SW08	103.598	1.047	0.000	0.13	5.0	SURCHARGED	5

Not for submission

For Demonstration Only  
Not for submission

For Demonstration Only  
Not for submission

The Alan Johnston Partnership		Page 16
1 Dale Street Liverpool L2 2ET		
Date 07/08/2017 14:15 File 217-111 - sw network.mdx	Designed by VincentWilliams Checked by	
XP Solutions	Network 2016.1	

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

**Not for submission**

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/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 Storage Structures 0  
Number of Online Controls 1      Number of Time/Area Diagrams 0  
Number of Offline Controls 0      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR      Ratio R 0.400  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 18.000      Cv (Winter) 0.840

**Not for submission**

Margin for Flood Risk Warning (mm) 100.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status ON  
DVD Status ON  
Inertia Status OFF

Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
Return Period(s) (years) 1, 2, 30, 100  
Climate Change (%) 0, 0, 0, 30

**For Demonstration Only**

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SW01	480 Winter	100	+30%	100/240 Winter			
1.001	SW02	480 Winter	100	+30%	100/15 Summer			
2.000	SW09	15 Winter	100	+30%				
2.001	SW10	15 Winter	100	+30%	100/15 Summer			
2.002	SW11	15 Winter	100	+30%	100/15 Summer			
1.002	SW03	480 Winter	100	+30%	100/120 Winter			
1.003	SW04	480 Winter	100	+30%	100/120 Winter			
1.004	SW05	480 Winter	100	+30%	100/120 Winter			
1.005	SW06	480 Winter	100	+30%	100/120 Winter			
1.006	SW07	480 Winter	100	+30%	100/120 Summer			
1.007	SW08	480 Winter	100	+30%	1/15 Summer	100/240 Winter		

**For Demonstration Only**

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow / Cap. (l/s)	Overflow Flow (l/s)	Pipe Status	Level Exceeded
1.000	SW01	104.821	0.321	0.000	0.06	3.9	SURCHARGED	
1.001	SW02	104.821	0.421	0.000	0.12	9.1	SURCHARGED	



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

Not for submission

PN	US/MH Name	Water	Surcharged	Flooded	Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap. (l/s)	Overflow Flow (l/s)		
2.000	SW09	105.406	-0.094	0.000	0.65	37.7	OK	
2.001	SW10	105.385	0.085	0.000	1.00	72.7	SURCHARGED	
2.002	SW11	105.176	0.075	0.000	1.53	93.7	SURCHARGED	
1.002	SW03	104.819	0.682	0.000	0.07	19.9	SURCHARGED	
1.003	SW04	104.818	0.688	0.000	0.01	25.2	SURCHARGED	
1.004	SW05	104.819	0.804	0.000	0.01	19.6	SURCHARGED	
1.005	SW06	104.819	0.868	0.000	0.01	18.6	SURCHARGED	
1.006	SW07	104.819	0.898	0.000	0.01	14.9	SURCHARGED	
1.007	SW08	104.819	2.268	18.816	0.15	5.6	FLOOD	5

Not for submission

For Demonstration Only

Not for submission

For Demonstration Only

Not for submission