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	Greenbridge Lane Halewood Rev A BBE Development Ltd	
Date 21/07/2025 13:27 File	Designed by J Hale Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.147	4-8	0.297

Total Area Contributing (ha) = 0.444

Total Pipe Volume (m³) = 463.581

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	10.189	0.038	268.1	0.075	4.00	0.0	0.600		o	300	Pipe/Conduit	
1.001	22.017	0.082	268.5	0.060	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.002	27.544	0.102	270.0	0.045	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.003	16.361	0.061	268.2	0.019	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)
1.000	50.00	4.18	7.600	0.075	0.0	0.0	0.0	0.96	67.5	10.2
1.001	50.00	4.56	7.562	0.135	0.0	0.0	0.0	0.95	67.5	18.3
1.002	50.00	5.04	7.480	0.180	0.0	0.0	0.0	0.95	67.3	24.4
1.003	50.00	5.33	7.378	0.199	0.0	0.0	0.0	0.96	67.5	26.9

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Halewood Rev A
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
2.000	25.657	0.095	270.1	0.066	4.00	0.0	0.600		o	300	Pipe/Conduit	
2.001	8.913	0.033	270.1	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.004	30.161	0.112	269.3	0.105	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.005	38.580	0.143	269.8	0.074	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.006	9.696	0.036	269.3	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.007	19.848	0.040	496.2	0.000	0.00	0.0		0.070	→_/		Pond/Tank	
1.008	12.954	0.047	275.6	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.000	50.00	4.45	7.400	0.066	0.0	0.0	0.0	0.95	67.3	8.9
2.001	50.00	4.61	7.305	0.066	0.0	0.0	0.0	0.95	67.3	8.9
1.004	50.00	5.86	7.272	0.370	0.0	0.0	0.0	0.95	67.4	50.1
1.005	50.00	6.53	7.160	0.444	0.0	0.0	0.0	0.95	67.3	60.1
1.006	50.00	6.70	7.017	0.444	0.0	0.0	0.0	0.95	67.4	60.1
1.007	50.00	7.17	6.906	0.444	0.0	0.0	0.0	0.70	15381.1	60.1
1.008	50.00	7.53	6.866	0.444	0.0	0.0	0.0	0.60	10.6	60.1

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	9.230	1.630	Open Manhole	1350	1.000	7.600	300				
2	9.065	1.503	Open Manhole	1350	1.001	7.562	300	1.000	7.562	300	
3	9.275	1.795	Open Manhole	1350	1.002	7.480	300	1.001	7.480	300	
4	9.977	2.599	Open Manhole	1350	1.003	7.378	300	1.002	7.378	300	
5	8.600	1.200	Open Manhole	1350	2.000	7.400	300				
6	8.850	1.545	Open Manhole	1350	2.001	7.305	300	2.000	7.305	300	
7	9.925	2.653	Open Manhole	1350	1.004	7.272	300	1.003	7.317	300	
								2.001	7.272	300	
8	8.890	1.730	Open Manhole	1350	1.005	7.160	300	1.004	7.160	300	
9	9.285	2.268	Open Manhole	1350	1.006	7.017	300	1.005	7.017	300	
headwall	8.500	1.594	Open Manhole	1800	1.007	6.906		1.006	6.981	300	
10	8.500	1.634	Open Manhole	1800	1.008	6.866	150	1.007	6.866		
	8.500	1.681	Open Manhole	0		OUTFALL		1.008	6.819	150	

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

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		1	9.230	7.600	1.330	Open Manhole	1350
1.001	o	300	2	9.065	7.562	1.203	Open Manhole	1350
1.002	o	300	3	9.275	7.480	1.495	Open Manhole	1350
1.003	o	300	4	9.977	7.378	2.299	Open Manhole	1350
2.000	o	300	5	8.600	7.400	0.900	Open Manhole	1350
2.001	o	300	6	8.850	7.305	1.245	Open Manhole	1350
1.004	o	300	7	9.925	7.272	2.353	Open Manhole	1350
1.005	o	300	8	8.890	7.160	1.430	Open Manhole	1350
1.006	o	300	9	9.285	7.017	1.968	Open Manhole	1350
1.007	→_/		headwall	8.500	6.906	0.000	Open Manhole	1800
1.008	o	150	10	8.500	6.866	1.484	Open Manhole	1800

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	10.189	268.1	2	9.065	7.562	1.203	Open Manhole	1350
1.001	22.017	268.5	3	9.275	7.480	1.495	Open Manhole	1350
1.002	27.544	270.0	4	9.977	7.378	2.299	Open Manhole	1350
1.003	16.361	268.2	7	9.925	7.317	2.308	Open Manhole	1350
2.000	25.657	270.1	6	8.850	7.305	1.245	Open Manhole	1350
2.001	8.913	270.1	7	9.925	7.272	2.353	Open Manhole	1350
1.004	30.161	269.3	8	8.890	7.160	1.430	Open Manhole	1350
1.005	38.580	269.8	9	9.285	7.017	1.968	Open Manhole	1350
1.006	9.696	269.3	headwall	8.500	6.981	1.219	Open Manhole	1800
1.007	19.848	496.2	10	8.500	6.866	0.040	Open Manhole	1800
1.008	12.954	275.6		8.500	6.819	1.531	Open Manhole	0

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)
1.008		8.500	6.819	0.000	0	0
Datum (m) 6.180 Offset (mins) 0						

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<u>Surcharged Outfall Details for Storm</u>									
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.000	51	1.000	101	1.000	151	1.000	201	1.000
2	1.000	52	1.000	102	1.000	152	1.000	202	1.000
3	1.000	53	1.000	103	1.000	153	1.000	203	1.000
4	1.000	54	1.000	104	1.000	154	1.000	204	1.000
5	1.000	55	1.000	105	1.000	155	1.000	205	1.000
6	1.000	56	1.000	106	1.000	156	1.000	206	1.000
7	1.000	57	1.000	107	1.000	157	1.000	207	1.000
8	1.000	58	1.000	108	1.000	158	1.000	208	1.000
9	1.000	59	1.000	109	1.000	159	1.000	209	1.000
10	1.000	60	1.000	110	1.000	160	1.000	210	1.000
11	1.000	61	1.000	111	1.000	161	1.000	211	1.000
12	1.000	62	1.000	112	1.000	162	1.000	212	1.000
13	1.000	63	1.000	113	1.000	163	1.000	213	1.000
14	1.000	64	1.000	114	1.000	164	1.000	214	1.000
15	1.000	65	1.000	115	1.000	165	1.000	215	1.000
16	1.000	66	1.000	116	1.000	166	1.000	216	1.000
17	1.000	67	1.000	117	1.000	167	1.000	217	1.000
18	1.000	68	1.000	118	1.000	168	1.000	218	1.000
19	1.000	69	1.000	119	1.000	169	1.000	219	1.000
20	1.000	70	1.000	120	1.000	170	1.000	220	1.000
21	1.000	71	1.000	121	1.000	171	1.000	221	1.000
22	1.000	72	1.000	122	1.000	172	1.000	222	1.000
23	1.000	73	1.000	123	1.000	173	1.000	223	1.000
24	1.000	74	1.000	124	1.000	174	1.000	224	1.000
25	1.000	75	1.000	125	1.000	175	1.000	225	1.000
26	1.000	76	1.000	126	1.000	176	1.000	226	1.000
27	1.000	77	1.000	127	1.000	177	1.000	227	1.000
28	1.000	78	1.000	128	1.000	178	1.000	228	1.000
29	1.000	79	1.000	129	1.000	179	1.000	229	1.000
30	1.000	80	1.000	130	1.000	180	1.000	230	1.000
31	1.000	81	1.000	131	1.000	181	1.000	231	1.000
32	1.000	82	1.000	132	1.000	182	1.000	232	1.000
33	1.000	83	1.000	133	1.000	183	1.000	233	1.000
34	1.000	84	1.000	134	1.000	184	1.000	234	1.000
35	1.000	85	1.000	135	1.000	185	1.000	235	1.000
36	1.000	86	1.000	136	1.000	186	1.000	236	1.000
37	1.000	87	1.000	137	1.000	187	1.000	237	1.000
38	1.000	88	1.000	138	1.000	188	1.000	238	1.000
39	1.000	89	1.000	139	1.000	189	1.000	239	1.000
40	1.000	90	1.000	140	1.000	190	1.000	240	1.000
41	1.000	91	1.000	141	1.000	191	1.000	241	1.000
42	1.000	92	1.000	142	1.000	192	1.000	242	1.000
43	1.000	93	1.000	143	1.000	193	1.000	243	1.000
44	1.000	94	1.000	144	1.000	194	1.000	244	1.000
45	1.000	95	1.000	145	1.000	195	1.000	245	1.000
46	1.000	96	1.000	146	1.000	196	1.000	246	1.000
47	1.000	97	1.000	147	1.000	197	1.000	247	1.000
48	1.000	98	1.000	148	1.000	198	1.000	248	1.000
49	1.000	99	1.000	149	1.000	199	1.000	249	1.000
50	1.000	100	1.000	150	1.000	200	1.000	250	1.000
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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)
301	1.000	351	1.000	401	1.000	451	1.000	501	1.000	551	1.000
302	1.000	352	1.000	402	1.000	452	1.000	502	1.000	552	1.000
303	1.000	353	1.000	403	1.000	453	1.000	503	1.000	553	1.000
304	1.000	354	1.000	404	1.000	454	1.000	504	1.000	554	1.000
305	1.000	355	1.000	405	1.000	455	1.000	505	1.000	555	1.000
306	1.000	356	1.000	406	1.000	456	1.000	506	1.000	556	1.000
307	1.000	357	1.000	407	1.000	457	1.000	507	1.000	557	1.000
308	1.000	358	1.000	408	1.000	458	1.000	508	1.000	558	1.000
309	1.000	359	1.000	409	1.000	459	1.000	509	1.000	559	1.000
310	1.000	360	1.000	410	1.000	460	1.000	510	1.000	560	1.000
311	1.000	361	1.000	411	1.000	461	1.000	511	1.000	561	1.000
312	1.000	362	1.000	412	1.000	462	1.000	512	1.000	562	1.000
313	1.000	363	1.000	413	1.000	463	1.000	513	1.000	563	1.000
314	1.000	364	1.000	414	1.000	464	1.000	514	1.000	564	1.000
315	1.000	365	1.000	415	1.000	465	1.000	515	1.000	565	1.000
316	1.000	366	1.000	416	1.000	466	1.000	516	1.000	566	1.000
317	1.000	367	1.000	417	1.000	467	1.000	517	1.000	567	1.000
318	1.000	368	1.000	418	1.000	468	1.000	518	1.000	568	1.000
319	1.000	369	1.000	419	1.000	469	1.000	519	1.000	569	1.000
320	1.000	370	1.000	420	1.000	470	1.000	520	1.000	570	1.000
321	1.000	371	1.000	421	1.000	471	1.000	521	1.000	571	1.000
322	1.000	372	1.000	422	1.000	472	1.000	522	1.000	572	1.000
323	1.000	373	1.000	423	1.000	473	1.000	523	1.000	573	1.000
324	1.000	374	1.000	424	1.000	474	1.000	524	1.000	574	1.000
325	1.000	375	1.000	425	1.000	475	1.000	525	1.000	575	1.000
326	1.000	376	1.000	426	1.000	476	1.000	526	1.000	576	1.000
327	1.000	377	1.000	427	1.000	477	1.000	527	1.000	577	1.000
328	1.000	378	1.000	428	1.000	478	1.000	528	1.000	578	1.000
329	1.000	379	1.000	429	1.000	479	1.000	529	1.000	579	1.000
330	1.000	380	1.000	430	1.000	480	1.000	530	1.000	580	1.000
331	1.000	381	1.000	431	1.000	481	1.000	531	1.000	581	1.000
332	1.000	382	1.000	432	1.000	482	1.000	532	1.000	582	1.000
333	1.000	383	1.000	433	1.000	483	1.000	533	1.000	583	1.000
334	1.000	384	1.000	434	1.000	484	1.000	534	1.000	584	1.000
335	1.000	385	1.000	435	1.000	485	1.000	535	1.000	585	1.000
336	1.000	386	1.000	436	1.000	486	1.000	536	1.000	586	1.000
337	1.000	387	1.000	437	1.000	487	1.000	537	1.000	587	1.000
338	1.000	388	1.000	438	1.000	488	1.000	538	1.000	588	1.000
339	1.000	389	1.000	439	1.000	489	1.000	539	1.000	589	1.000
340	1.000	390	1.000	440	1.000	490	1.000	540	1.000	590	1.000
341	1.000	391	1.000	441	1.000	491	1.000	541	1.000	591	1.000
342	1.000	392	1.000	442	1.000	492	1.000	542	1.000	592	1.000
343	1.000	393	1.000	443	1.000	493	1.000	543	1.000	593	1.000
344	1.000	394	1.000	444	1.000	494	1.000	544	1.000	594	1.000
345	1.000	395	1.000	445	1.000	495	1.000	545	1.000	595	1.000
346	1.000	396	1.000	446	1.000	496	1.000	546	1.000	596	1.000
347	1.000	397	1.000	447	1.000	497	1.000	547	1.000	597	1.000
348	1.000	398	1.000	448	1.000	498	1.000	548	1.000	598	1.000
349	1.000	399	1.000	449	1.000	499	1.000	549	1.000	599	1.000
350	1.000	400	1.000	450	1.000	500	1.000	550	1.000	600	1.000

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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)
601	1.000	651	1.000	701	1.000	751	1.000	801	1.000	851	1.000
602	1.000	652	1.000	702	1.000	752	1.000	802	1.000	852	1.000
603	1.000	653	1.000	703	1.000	753	1.000	803	1.000	853	1.000
604	1.000	654	1.000	704	1.000	754	1.000	804	1.000	854	1.000
605	1.000	655	1.000	705	1.000	755	1.000	805	1.000	855	1.000
606	1.000	656	1.000	706	1.000	756	1.000	806	1.000	856	1.000
607	1.000	657	1.000	707	1.000	757	1.000	807	1.000	857	1.000
608	1.000	658	1.000	708	1.000	758	1.000	808	1.000	858	1.000
609	1.000	659	1.000	709	1.000	759	1.000	809	1.000	859	1.000
610	1.000	660	1.000	710	1.000	760	1.000	810	1.000	860	1.000
611	1.000	661	1.000	711	1.000	761	1.000	811	1.000	861	1.000
612	1.000	662	1.000	712	1.000	762	1.000	812	1.000	862	1.000
613	1.000	663	1.000	713	1.000	763	1.000	813	1.000	863	1.000
614	1.000	664	1.000	714	1.000	764	1.000	814	1.000	864	1.000
615	1.000	665	1.000	715	1.000	765	1.000	815	1.000	865	1.000
616	1.000	666	1.000	716	1.000	766	1.000	816	1.000	866	1.000
617	1.000	667	1.000	717	1.000	767	1.000	817	1.000	867	1.000
618	1.000	668	1.000	718	1.000	768	1.000	818	1.000	868	1.000
619	1.000	669	1.000	719	1.000	769	1.000	819	1.000	869	1.000
620	1.000	670	1.000	720	1.000	770	1.000	820	1.000	870	1.000
621	1.000	671	1.000	721	1.000	771	1.000	821	1.000	871	1.000
622	1.000	672	1.000	722	1.000	772	1.000	822	1.000	872	1.000
623	1.000	673	1.000	723	1.000	773	1.000	823	1.000	873	1.000
624	1.000	674	1.000	724	1.000	774	1.000	824	1.000	874	1.000
625	1.000	675	1.000	725	1.000	775	1.000	825	1.000	875	1.000
626	1.000	676	1.000	726	1.000	776	1.000	826	1.000	876	1.000
627	1.000	677	1.000	727	1.000	777	1.000	827	1.000	877	1.000
628	1.000	678	1.000	728	1.000	778	1.000	828	1.000	878	1.000
629	1.000	679	1.000	729	1.000	779	1.000	829	1.000	879	1.000
630	1.000	680	1.000	730	1.000	780	1.000	830	1.000	880	1.000
631	1.000	681	1.000	731	1.000	781	1.000	831	1.000	881	1.000
632	1.000	682	1.000	732	1.000	782	1.000	832	1.000	882	1.000
633	1.000	683	1.000	733	1.000	783	1.000	833	1.000	883	1.000
634	1.000	684	1.000	734	1.000	784	1.000	834	1.000	884	1.000
635	1.000	685	1.000	735	1.000	785	1.000	835	1.000	885	1.000
636	1.000	686	1.000	736	1.000	786	1.000	836	1.000	886	1.000
637	1.000	687	1.000	737	1.000	787	1.000	837	1.000	887	1.000
638	1.000	688	1.000	738	1.000	788	1.000	838	1.000	888	1.000
639	1.000	689	1.000	739	1.000	789	1.000	839	1.000	889	1.000
640	1.000	690	1.000	740	1.000	790	1.000	840	1.000	890	1.000
641	1.000	691	1.000	741	1.000	791	1.000	841	1.000	891	1.000
642	1.000	692	1.000	742	1.000	792	1.000	842	1.000	892	1.000
643	1.000	693	1.000	743	1.000	793	1.000	843	1.000	893	1.000
644	1.000	694	1.000	744	1.000	794	1.000	844	1.000	894	1.000
645	1.000	695	1.000	745	1.000	795	1.000	845	1.000	895	1.000
646	1.000	696	1.000	746	1.000	796	1.000	846	1.000	896	1.000
647	1.000	697	1.000	747	1.000	797	1.000	847	1.000	897	1.000
648	1.000	698	1.000	748	1.000	798	1.000	848	1.000	898	1.000
649	1.000	699	1.000	749	1.000	799	1.000	849	1.000	899	1.000
650	1.000	700	1.000	750	1.000	800	1.000	850	1.000	900	1.000

Greenbridge Lane
Halewood Rev A
BBE Development Ltd



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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)
901	1.000	951	1.000	1001	1.000	1051	1.000	1101	1.000	1151	1.000
902	1.000	952	1.000	1002	1.000	1052	1.000	1102	1.000	1152	1.000
903	1.000	953	1.000	1003	1.000	1053	1.000	1103	1.000	1153	1.000
904	1.000	954	1.000	1004	1.000	1054	1.000	1104	1.000	1154	1.000
905	1.000	955	1.000	1005	1.000	1055	1.000	1105	1.000	1155	1.000
906	1.000	956	1.000	1006	1.000	1056	1.000	1106	1.000	1156	1.000
907	1.000	957	1.000	1007	1.000	1057	1.000	1107	1.000	1157	1.000
908	1.000	958	1.000	1008	1.000	1058	1.000	1108	1.000	1158	1.000
909	1.000	959	1.000	1009	1.000	1059	1.000	1109	1.000	1159	1.000
910	1.000	960	1.000	1010	1.000	1060	1.000	1110	1.000	1160	1.000
911	1.000	961	1.000	1011	1.000	1061	1.000	1111	1.000	1161	1.000
912	1.000	962	1.000	1012	1.000	1062	1.000	1112	1.000	1162	1.000
913	1.000	963	1.000	1013	1.000	1063	1.000	1113	1.000	1163	1.000
914	1.000	964	1.000	1014	1.000	1064	1.000	1114	1.000	1164	1.000
915	1.000	965	1.000	1015	1.000	1065	1.000	1115	1.000	1165	1.000
916	1.000	966	1.000	1016	1.000	1066	1.000	1116	1.000	1166	1.000
917	1.000	967	1.000	1017	1.000	1067	1.000	1117	1.000	1167	1.000
918	1.000	968	1.000	1018	1.000	1068	1.000	1118	1.000	1168	1.000
919	1.000	969	1.000	1019	1.000	1069	1.000	1119	1.000	1169	1.000
920	1.000	970	1.000	1020	1.000	1070	1.000	1120	1.000	1170	1.000
921	1.000	971	1.000	1021	1.000	1071	1.000	1121	1.000	1171	1.000
922	1.000	972	1.000	1022	1.000	1072	1.000	1122	1.000	1172	1.000
923	1.000	973	1.000	1023	1.000	1073	1.000	1123	1.000	1173	1.000
924	1.000	974	1.000	1024	1.000	1074	1.000	1124	1.000	1174	1.000
925	1.000	975	1.000	1025	1.000	1075	1.000	1125	1.000	1175	1.000
926	1.000	976	1.000	1026	1.000	1076	1.000	1126	1.000	1176	1.000
927	1.000	977	1.000	1027	1.000	1077	1.000	1127	1.000	1177	1.000
928	1.000	978	1.000	1028	1.000	1078	1.000	1128	1.000	1178	1.000
929	1.000	979	1.000	1029	1.000	1079	1.000	1129	1.000	1179	1.000
930	1.000	980	1.000	1030	1.000	1080	1.000	1130	1.000	1180	1.000
931	1.000	981	1.000	1031	1.000	1081	1.000	1131	1.000	1181	1.000
932	1.000	982	1.000	1032	1.000	1082	1.000	1132	1.000	1182	1.000
933	1.000	983	1.000	1033	1.000	1083	1.000	1133	1.000	1183	1.000
934	1.000	984	1.000	1034	1.000	1084	1.000	1134	1.000	1184	1.000
935	1.000	985	1.000	1035	1.000	1085	1.000	1135	1.000	1185	1.000
936	1.000	986	1.000	1036	1.000	1086	1.000	1136	1.000	1186	1.000
937	1.000	987	1.000	1037	1.000	1087	1.000	1137	1.000	1187	1.000
938	1.000	988	1.000	1038	1.000	1088	1.000	1138	1.000	1188	1.000
939	1.000	989	1.000	1039	1.000	1089	1.000	1139	1.000	1189	1.000
940	1.000	990	1.000	1040	1.000	1090	1.000	1140	1.000	1190	1.000
941	1.000	991	1.000	1041	1.000	1091	1.000	1141	1.000	1191	1.000
942	1.000	992	1.000	1042	1.000	1092	1.000	1142	1.000	1192	1.000
943	1.000	993	1.000	1043	1.000	1093	1.000	1143	1.000	1193	1.000
944	1.000	994	1.000	1044	1.000	1094	1.000	1144	1.000	1194	1.000
945	1.000	995	1.000	1045	1.000	1095	1.000	1145	1.000	1195	1.000
946	1.000	996	1.000	1046	1.000	1096	1.000	1146	1.000	1196	1.000
947	1.000	997	1.000	1047	1.000	1097	1.000	1147	1.000	1197	1.000
948	1.000	998	1.000	1048	1.000	1098	1.000	1148	1.000	1198	1.000
949	1.000	999	1.000	1049	1.000	1099	1.000	1149	1.000	1199	1.000
950	1.000	1000	1.000	1050	1.000	1100	1.000	1150	1.000	1200	1.000

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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)
1201	1.000	1241	1.000	1281	1.000	1321	1.000	1361	1.000	1401	1.000
1202	1.000	1242	1.000	1282	1.000	1322	1.000	1362	1.000	1402	1.000
1203	1.000	1243	1.000	1283	1.000	1323	1.000	1363	1.000	1403	1.000
1204	1.000	1244	1.000	1284	1.000	1324	1.000	1364	1.000	1404	1.000
1205	1.000	1245	1.000	1285	1.000	1325	1.000	1365	1.000	1405	1.000
1206	1.000	1246	1.000	1286	1.000	1326	1.000	1366	1.000	1406	1.000
1207	1.000	1247	1.000	1287	1.000	1327	1.000	1367	1.000	1407	1.000
1208	1.000	1248	1.000	1288	1.000	1328	1.000	1368	1.000	1408	1.000
1209	1.000	1249	1.000	1289	1.000	1329	1.000	1369	1.000	1409	1.000
1210	1.000	1250	1.000	1290	1.000	1330	1.000	1370	1.000	1410	1.000
1211	1.000	1251	1.000	1291	1.000	1331	1.000	1371	1.000	1411	1.000
1212	1.000	1252	1.000	1292	1.000	1332	1.000	1372	1.000	1412	1.000
1213	1.000	1253	1.000	1293	1.000	1333	1.000	1373	1.000	1413	1.000
1214	1.000	1254	1.000	1294	1.000	1334	1.000	1374	1.000	1414	1.000
1215	1.000	1255	1.000	1295	1.000	1335	1.000	1375	1.000	1415	1.000
1216	1.000	1256	1.000	1296	1.000	1336	1.000	1376	1.000	1416	1.000
1217	1.000	1257	1.000	1297	1.000	1337	1.000	1377	1.000	1417	1.000
1218	1.000	1258	1.000	1298	1.000	1338	1.000	1378	1.000	1418	1.000
1219	1.000	1259	1.000	1299	1.000	1339	1.000	1379	1.000	1419	1.000
1220	1.000	1260	1.000	1300	1.000	1340	1.000	1380	1.000	1420	1.000
1221	1.000	1261	1.000	1301	1.000	1341	1.000	1381	1.000	1421	1.000
1222	1.000	1262	1.000	1302	1.000	1342	1.000	1382	1.000	1422	1.000
1223	1.000	1263	1.000	1303	1.000	1343	1.000	1383	1.000	1423	1.000
1224	1.000	1264	1.000	1304	1.000	1344	1.000	1384	1.000	1424	1.000
1225	1.000	1265	1.000	1305	1.000	1345	1.000	1385	1.000	1425	1.000
1226	1.000	1266	1.000	1306	1.000	1346	1.000	1386	1.000	1426	1.000
1227	1.000	1267	1.000	1307	1.000	1347	1.000	1387	1.000	1427	1.000
1228	1.000	1268	1.000	1308	1.000	1348	1.000	1388	1.000	1428	1.000
1229	1.000	1269	1.000	1309	1.000	1349	1.000	1389	1.000	1429	1.000
1230	1.000	1270	1.000	1310	1.000	1350	1.000	1390	1.000	1430	1.000
1231	1.000	1271	1.000	1311	1.000	1351	1.000	1391	1.000	1431	1.000
1232	1.000	1272	1.000	1312	1.000	1352	1.000	1392	1.000	1432	1.000
1233	1.000	1273	1.000	1313	1.000	1353	1.000	1393	1.000	1433	1.000
1234	1.000	1274	1.000	1314	1.000	1354	1.000	1394	1.000	1434	1.000
1235	1.000	1275	1.000	1315	1.000	1355	1.000	1395	1.000	1435	1.000
1236	1.000	1276	1.000	1316	1.000	1356	1.000	1396	1.000	1436	1.000
1237	1.000	1277	1.000	1317	1.000	1357	1.000	1397	1.000	1437	1.000
1238	1.000	1278	1.000	1318	1.000	1358	1.000	1398	1.000	1438	1.000
1239	1.000	1279	1.000	1319	1.000	1359	1.000	1399	1.000	1439	1.000
1240	1.000	1280	1.000	1320	1.000	1360	1.000	1400	1.000	1440	1.000

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Simulation Criteria for Storm

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 Storage Structures	8
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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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<u>Online Controls for Storm</u> <u>Hydro-Brake® Optimum Manhole: 10, DS/PN: 1.008, Volume (m³): 413.3</u> <table><tr><td>Unit Reference</td><td>MD-SHE-0103-6000-1800-6000</td></tr><tr><td>Design Head (m)</td><td>1.800</td></tr><tr><td>Design Flow (l/s)</td><td>6.0</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>103</td></tr><tr><td>Invert Level (m)</td><td>6.866</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>150</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1200</td></tr></table> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.800</td><td>6.0</td></tr><tr><td>Flush-Flo™</td><td>0.453</td><td>5.5</td></tr><tr><td>Kick-Flo®</td><td>0.920</td><td>4.4</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>5.0</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>3.5</td><td>1.200</td><td>5.0</td><td>3.000</td><td>7.6</td><td>7.000</td><td>11.4</td></tr><tr><td>0.200</td><td>4.9</td><td>1.400</td><td>5.3</td><td>3.500</td><td>8.2</td><td>7.500</td><td>11.8</td></tr><tr><td>0.300</td><td>5.3</td><td>1.600</td><td>5.7</td><td>4.000</td><td>8.7</td><td>8.000</td><td>12.1</td></tr><tr><td>0.400</td><td>5.5</td><td>1.800</td><td>6.0</td><td>4.500</td><td>9.2</td><td>8.500</td><td>12.5</td></tr><tr><td>0.500</td><td>5.5</td><td>2.000</td><td>6.3</td><td>5.000</td><td>9.7</td><td>9.000</td><td>12.8</td></tr><tr><td>0.600</td><td>5.4</td><td>2.200</td><td>6.6</td><td>5.500</td><td>10.2</td><td>9.500</td><td>13.2</td></tr><tr><td>0.800</td><td>5.0</td><td>2.400</td><td>6.9</td><td>6.000</td><td>10.6</td><td></td><td></td></tr><tr><td>1.000</td><td>4.6</td><td>2.600</td><td>7.1</td><td>6.500</td><td>11.0</td><td></td><td></td></tr></table>			Unit Reference	MD-SHE-0103-6000-1800-6000	Design Head (m)	1.800	Design Flow (l/s)	6.0	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	103	Invert Level (m)	6.866	Minimum Outlet Pipe Diameter (mm)	150	Suggested Manhole Diameter (mm)	1200	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.800	6.0	Flush-Flo™	0.453	5.5	Kick-Flo®	0.920	4.4	Mean Flow over Head Range	-	5.0	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.5	1.200	5.0	3.000	7.6	7.000	11.4	0.200	4.9	1.400	5.3	3.500	8.2	7.500	11.8	0.300	5.3	1.600	5.7	4.000	8.7	8.000	12.1	0.400	5.5	1.800	6.0	4.500	9.2	8.500	12.5	0.500	5.5	2.000	6.3	5.000	9.7	9.000	12.8	0.600	5.4	2.200	6.6	5.500	10.2	9.500	13.2	0.800	5.0	2.400	6.9	6.000	10.6			1.000	4.6	2.600	7.1	6.500	11.0		
Unit Reference	MD-SHE-0103-6000-1800-6000																																																																																																														
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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																																																								
0.100	3.5	1.200	5.0	3.000	7.6	7.000	11.4																																																																																																								
0.200	4.9	1.400	5.3	3.500	8.2	7.500	11.8																																																																																																								
0.300	5.3	1.600	5.7	4.000	8.7	8.000	12.1																																																																																																								
0.400	5.5	1.800	6.0	4.500	9.2	8.500	12.5																																																																																																								
0.500	5.5	2.000	6.3	5.000	9.7	9.000	12.8																																																																																																								
0.600	5.4	2.200	6.6	5.500	10.2	9.500	13.2																																																																																																								
0.800	5.0	2.400	6.9	6.000	10.6																																																																																																										
1.000	4.6	2.600	7.1	6.500	11.0																																																																																																										
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<u>Storage Structures for Storm</u>		
<u>Porous Car Park Manhole: 1, DS/PN: 1.000</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m) 26.2
Membrane Percolation (mm/hr)	1000	Length (m) 10.0
Max Percolation (l/s)	72.8	Slope (1:X) 500.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.30	Evaporation (mm/day) 3
Invert Level (m)	8.750	Membrane Depth (mm) 120
<u>Porous Car Park Manhole: 2, DS/PN: 1.001</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m) 10.0
Membrane Percolation (mm/hr)	1000	Length (m) 14.6
Max Percolation (l/s)	40.6	Slope (1:X) 500.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.30	Evaporation (mm/day) 3
Invert Level (m)	8.500	Membrane Depth (mm) 120
<u>Porous Car Park Manhole: 3, DS/PN: 1.002</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m) 9.3
Membrane Percolation (mm/hr)	1000	Length (m) 10.0
Max Percolation (l/s)	25.8	Slope (1:X) 500.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.30	Evaporation (mm/day) 3
Invert Level (m)	8.750	Membrane Depth (mm) 120
<u>Porous Car Park Manhole: 6, DS/PN: 2.001</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m) 20.5
Membrane Percolation (mm/hr)	1000	Length (m) 10.0
Max Percolation (l/s)	56.9	Slope (1:X) 500.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.30	Evaporation (mm/day) 3
Invert Level (m)	8.300	Membrane Depth (mm) 120
<u>Porous Car Park Manhole: 7, DS/PN: 1.004</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m) 6.4
Membrane Percolation (mm/hr)	1000	Length (m) 10.0
Max Percolation (l/s)	17.8	Slope (1:X) 500.0
Safety Factor	2.0	Depression Storage (mm) 5
Porosity	0.30	Evaporation (mm/day) 3
Invert Level (m)	9.400	Membrane Depth (mm) 120
<u>Porous Car Park Manhole: 8, DS/PN: 1.005</u>		
Infiltration Coefficient Base (m/hr)	0.00000	Max Percolation (l/s) 55.8
Membrane Percolation (mm/hr)	1000	Safety Factor 2.0
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<u>Porous Car Park Manhole: 8, DS/PN: 1.005</u> <table><tr><td>Porosity</td><td>0.30</td><td>Slope (1:X)</td><td>500.0</td></tr><tr><td>Invert Level (m)</td><td>8.350</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Width (m)</td><td>10.0</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Length (m)</td><td>20.1</td><td>Membrane Depth (mm)</td><td>120</td></tr></table> <u>Porous Car Park Manhole: 9, DS/PN: 1.006</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>9.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>10.0</td></tr><tr><td>Max Percolation (l/s)</td><td>25.0</td><td>Slope (1:X)</td><td>500.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>8.750</td><td>Membrane Depth (mm)</td><td>120</td></tr></table> <u>Tank or Pond Pipe: 1.007</u> Manning's N 0.070 Invert Level (m) 6.906 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>165.3</td><td>1.494</td><td>368.1</td></tr></table> <u>Volume Summary (Static)</u> Length Calculations based on True Length <table><tr><th>Pipe Number</th><th>USMH Name</th><th>Manhole Volume (m³)</th><th>Pipe Volume (m³)</th><th>Storage Structure Volume (m³)</th><th>Total Volume (m³)</th></tr><tr><td>1.000</td><td>1</td><td>2.333</td><td>0.625</td><td>28.296</td><td>31.254</td></tr><tr><td>1.001</td><td>2</td><td>2.151</td><td>1.461</td><td>19.491</td><td>23.103</td></tr><tr><td>1.002</td><td>3</td><td>2.569</td><td>1.852</td><td>11.300</td><td>15.720</td></tr><tr><td>1.003</td><td>4</td><td>3.720</td><td>1.061</td><td>0.000</td><td>4.781</td></tr><tr><td>2.000</td><td>5</td><td>1.718</td><td>1.718</td><td>0.000</td><td>3.436</td></tr><tr><td>2.001</td><td>6</td><td>2.211</td><td>0.535</td><td>26.445</td><td>29.191</td></tr><tr><td>1.004</td><td>7</td><td>3.797</td><td>2.037</td><td>7.776</td><td>13.610</td></tr><tr><td>1.005</td><td>8</td><td>2.476</td><td>2.632</td><td>25.326</td><td>30.434</td></tr><tr><td>1.006</td><td>9</td><td>3.246</td><td>0.574</td><td>11.205</td><td>15.025</td></tr><tr><td>1.007</td><td>headwall</td><td>4.056</td><td>409.175</td><td>0.000</td><td>413.231</td></tr><tr><td>1.008</td><td>10</td><td>4.158</td><td>0.213</td><td>0.000</td><td>4.371</td></tr><tr><td>Total</td><td></td><td>32.438</td><td>421.881</td><td>129.839</td><td>584.157</td></tr></table>						Porosity	0.30	Slope (1:X)	500.0	Invert Level (m)	8.350	Depression Storage (mm)	5	Width (m)	10.0	Evaporation (mm/day)	3	Length (m)	20.1	Membrane Depth (mm)	120	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0	Membrane Percolation (mm/hr)	1000	Length (m)	10.0	Max Percolation (l/s)	25.0	Slope (1:X)	500.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.750	Membrane Depth (mm)	120	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	165.3	1.494	368.1	Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)	1.000	1	2.333	0.625	28.296	31.254	1.001	2	2.151	1.461	19.491	23.103	1.002	3	2.569	1.852	11.300	15.720	1.003	4	3.720	1.061	0.000	4.781	2.000	5	1.718	1.718	0.000	3.436	2.001	6	2.211	0.535	26.445	29.191	1.004	7	3.797	2.037	7.776	13.610	1.005	8	2.476	2.632	25.326	30.434	1.006	9	3.246	0.574	11.205	15.025	1.007	headwall	4.056	409.175	0.000	413.231	1.008	10	4.158	0.213	0.000	4.371	Total		32.438	421.881	129.839	584.157
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

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 Coeffiecient	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	8
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)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100, 200
Climate Change (%)	0, 0, 45, 45

PN	US/MH		Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
	Name	Storm						
1.000	1	15 Winter	1	+0%	30/15 Summer			
1.001	2	15 Winter	1	+0%	30/15 Summer			
1.002	3	15 Winter	1	+0%	30/15 Summer			
1.003	4	15 Winter	1	+0%	30/15 Summer			
2.000	5	15 Winter	1	+0%	30/15 Summer	200/15 Summer		
2.001	6	15 Winter	1	+0%	30/15 Summer			
1.004	7	15 Winter	1	+0%	30/15 Summer			
1.005	8	15 Winter	1	+0%	30/15 Summer			
1.006	9	960 Winter	1	+0%	30/15 Summer			
1.007	headwall	960 Winter	1	+0%				
1.008	10	960 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water	Surcharged	Flooded			Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
1.000	1	7.700	-0.200	0.000	0.21		6	11.1	OK
1.001	2	7.676	-0.186	0.000	0.30		7	17.8	OK

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
1.002	3	7.607	-0.173	0.000	0.37		6	22.3	OK
1.003	4	7.513	-0.165	0.000	0.41			23.7	OK
2.000	5	7.486	-0.214	0.000	0.16			9.6	OK
2.001	6	7.457	-0.148	0.000	0.15		5	7.5	OK
1.004	7	7.453	-0.119	0.000	0.66		6	40.4	OK
1.005	8	7.355	-0.105	0.000	0.74		6	46.1	OK
1.006	9	7.253	-0.064	0.000	0.08		848	4.4	OK
1.007	headwall	7.251	-1.249	0.000	0.00			4.3	OK
1.008	10	7.251	0.235	0.000	0.55			5.3	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000		1
1.001		2
1.002		3
1.003		4
2.000		5
2.001		6
1.004		7
1.005		8
1.006		9
1.007	headwall	
1.008	10	

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

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 Coeffiecient	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	8
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)	20.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100, 200
Climate Change (%)	0, 0, 45, 45

PN	US/MH		Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
	Name	Storm						
1.000	1	15 Winter	30	+0%	30/15 Summer			
1.001	2	15 Winter	30	+0%	30/15 Summer			
1.002	3	15 Winter	30	+0%	30/15 Summer			
1.003	4	15 Winter	30	+0%	30/15 Summer			
2.000	5	15 Winter	30	+0%	30/15 Summer	200/15 Summer		
2.001	6	15 Winter	30	+0%	30/15 Summer			
1.004	7	15 Winter	30	+0%	30/15 Summer			
1.005	8	15 Winter	30	+0%	30/15 Summer			
1.006	9	360 Winter	30	+0%	30/15 Summer			
1.007	headwall	360 Winter	30	+0%				
1.008	10	360 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water	Surcharged	Flooded			Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
1.000	1	8.229	0.329	0.000	0.48		5	25.5	SURCHARGED
1.001	2	8.218	0.356	0.000	0.71		6	42.2	SURCHARGED

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)		Overflow (l/s)	Time (mins)	
1.002	3	8.139	0.359	0.000	0.76	7	46.1	SURCHARGED
1.003	4	8.059	0.381	0.000	0.77		43.9	SURCHARGED
2.000	5	8.013	0.313	0.000	0.30		17.9	SURCHARGED
2.001	6	7.994	0.389	0.000	0.32	8	16.5	SURCHARGED
1.004	7	7.985	0.413	0.000	1.33	8	81.5	SURCHARGED
1.005	8	7.778	0.318	0.000	1.55	11	96.6	SURCHARGED
1.006	9	7.493	0.176	0.000	0.38	300	19.9	SURCHARGED
1.007	headwall	7.490	-1.010	0.000	0.00		19.8	OK
1.008	10	7.490	0.474	0.000	0.55		5.3	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	1	
1.001	2	
1.002	3	
1.003	4	
2.000	5	4
2.001	6	
1.004	7	
1.005	8	
1.006	9	
1.007	headwall	
1.008	10	

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>								
<u>Simulation Criteria</u>								
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 Coeffiecient 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 8								
Number of Online Controls 1 Number of Time/Area Diagrams 0								
Number of Offline Controls 0 Number of Real Time Controls 0								
<u>Synthetic Rainfall Details</u>								
Rainfall Model FSR Ratio R 0.400								
Region England and Wales Cv (Summer) 0.750								
M5-60 (mm) 20.000 Cv (Winter) 0.840								
Margin for Flood Risk Warning (mm) 300.0 DVD Status ON								
Analysis Timestep Fine Inertia Status ON								
DTS Status OFF								
Profile(s) Summer and Winter								
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080								
Return Period(s) (years) 1, 30, 100, 200								
Climate Change (%) 0, 0, 45, 45								
WARNING: Half Drain Time has not been calculated as the structure is too full.								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	100	+45%	30/15 Summer			
1.001	2	15 Winter	100	+45%	30/15 Summer			
1.002	3	15 Winter	100	+45%	30/15 Summer			
1.003	4	15 Winter	100	+45%	30/15 Summer			
2.000	5	15 Winter	100	+45%	30/15 Summer	200/15 Summer		
2.001	6	15 Winter	100	+45%	30/15 Summer			
1.004	7	15 Winter	100	+45%	30/15 Summer			
1.005	8	15 Summer	100	+45%	30/15 Summer			
1.006	9	360 Winter	100	+45%	30/15 Summer			
1.007	headwall	360 Winter	100	+45%				
1.008	10	360 Winter	100	+45%	1/15 Summer			
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	8.758	0.858	0.000	0.92	9	48.7	SURCHARGED
1.001	2	8.744	0.882	0.000	0.74	7	44.0	SURCHARGED
1.002	3	8.699	0.919	0.000	0.94	13	57.3	SURCHARGED
1.003	4	8.598	0.920	0.000	1.13		64.8	SURCHARGED
2.000	5	8.591	0.891	0.000	0.66		39.6	FLOOD RISK
2.001	6	8.522	0.917	0.000	0.89	7	45.7	SURCHARGED
1.004	7	8.521	0.949	0.000	1.77	17	108.2	SURCHARGED
1.005	8	8.244	0.784	0.000	2.12	33	132.1	SURCHARGED
1.006	9	7.971	0.654	0.000	0.69		36.4	SURCHARGED
1.007	headwall	7.967	-0.533	0.000	0.00		36.2	OK
1.008	10	7.967	0.951	0.000	0.57		5.5	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	1	
1.001	2	
1.002	3	
1.003	4	
2.000	5	4
2.001	6	
1.004	7	
1.005	8	
1.006	9	
1.007	headwall	
1.008	10	

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<u>200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>								
<u>Simulation Criteria</u>								
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 Coeffiecient 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 8								
Number of Online Controls 1 Number of Time/Area Diagrams 0								
Number of Offline Controls 0 Number of Real Time Controls 0								
<u>Synthetic Rainfall Details</u>								
Rainfall Model FSR Ratio R 0.400								
Region England and Wales Cv (Summer) 0.750								
M5-60 (mm) 20.000 Cv (Winter) 0.840								
Margin for Flood Risk Warning (mm) 300.0 DVD Status ON								
Analysis Timestep Fine Inertia Status ON								
DTS Status OFF								
Profile(s) Summer and Winter								
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,								
720, 960, 1440, 2160, 2880, 4320, 5760,								
7200, 8640, 10080								
Return Period(s) (years) 1, 30, 100, 200								
Climate Change (%) 0, 0, 45, 45								
WARNING: Half Drain Time has not been calculated as the structure is too full.								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Overflow	Overflow Act.
1.000	1	15 Winter	200	+45%	30/15 Summer			
1.001	2	15 Winter	200	+45%	30/15 Summer			
1.002	3	15 Winter	200	+45%	30/15 Summer			
1.003	4	15 Winter	200	+45%	30/15 Summer			
2.000	5	15 Winter	200	+45%	30/15 Summer	200/15 Summer		
2.001	6	15 Winter	200	+45%	30/15 Summer			
1.004	7	15 Winter	200	+45%	30/15 Summer			
1.005	8	15 Winter	200	+45%	30/15 Summer			
1.006	9	480 Winter	200	+45%	30/15 Summer			
1.007	headwall	480 Winter	200	+45%				
1.008	10	480 Winter	200	+45%	1/15 Summer			
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200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	8.822	0.922	0.000	1.01	6	53.4	SURCHARGED
1.001	2	8.807	0.945	0.000	0.83	8	49.5	FLOOD RISK
1.002	3	8.766	0.986	0.000	0.89	16	54.0	SURCHARGED
1.003	4	8.696	1.018	0.000	1.11		63.7	SURCHARGED
2.000	5	8.603	0.903	2.908	0.78		47.1	FLOOD
2.001	6	8.603	0.998	0.000	0.90	9	46.1	FLOOD RISK
1.004	7	8.620	1.048	0.000	1.78	24	109.1	SURCHARGED
1.005	8	8.325	0.865	0.000	2.24	137	139.5	SURCHARGED
1.006	9	8.147	0.830	0.000	0.65		34.1	SURCHARGED
1.007	headwall	8.143	-0.357	0.000	0.00		33.8	OK
1.008	10	8.143	1.127	0.000	0.57		5.5	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	1	
1.001	2	
1.002	3	
1.003	4	
2.000	5	4
2.001	6	
1.004	7	
1.005	8	
1.006	9	
1.007	headwall	
1.008	10	