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3rd Floor, Marlborough House 48 Holly Walk Leamington Spa CV32 4XP	Winscott Farm SW Drainage Rev P03	
Date 05/12/2023 16:02 File SURFACE WATER NETWORK 1 ...	Designed by IS Checked by AM	
Micro Drainage	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for JNP Surface Water Network

Pipe Sizes Standard Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 487382 226367 SP 87382 26367	
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	15
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	40
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for JNP Surface Water Network

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.129	4-8	0.089	8-12	0.041	12-16	0.040	16-20	0.005

Total Area Contributing (ha) = 0.305


Total Pipe Volume (m<sup>3</sup>) = 6.879

Network Design Table for JNP Surface Water Network

« - Indicates pipe capacity < flow


<b>PN Length</b>	<b>Fall</b>	<b>Slope</b>	<b>I.Area</b>	<b>T.E.</b>	<b>Base</b>	<b>k</b>	<b>HYD</b>	<b>DIA</b>	<b>Section</b>	<b>Type</b>	<b>Auto</b>
<b>(m)</b>	<b>(m)</b>	<b>(1:X)</b>	<b>(ha)</b>	<b>(mins)</b>	<b>Flow (l/s)</b>	<b>(mm)</b>	<b>SECT</b>	<b>(mm)</b>			<b>Design</b>

Network Results Table
















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Network Design Table for JNP Surface Water Network

<b>PN</b>	<b>Rain</b>	<b>T.C.</b>	<b>US/IL</b>	<b>Σ I.Area</b>	<b>Σ Base</b>	<b>Foul</b>	<b>Add Flow</b>	<b>Vel</b>	<b>Cap</b>	<b>Flow</b>
	<b>(mm/hr)</b>	<b>(mins)</b>	<b>(m)</b>	<b>(ha)</b>	<b>Flow (l/s)</b>	<b>(l/s)</b>	<b>(l/s)</b>	<b>(m/s)</b>	<b>(l/s)</b>	<b>(l/s)</b>


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Network Design Table for JNP Surface Water Network













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	19.307	0.241	80.0	0.010	15.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	14.148	0.177	80.0	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	7.118	0.089	80.0	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	23.481	0.294	80.0	0.008	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.004	19.761	0.494	40.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.005	6.761	0.519	13.0	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	1.602	0.534	3.0	0.030	15.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	2.769	0.462	6.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.002	19.079	0.658	29.0	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	1.696	0.565	3.0	0.016	15.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	2.452	0.245	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.003	9.703	0.231	42.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.004	15.415	0.103	150.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	14.605	0.097	150.0	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	4.721	0.429	11.0	0.000	15.00	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)
1.000	50.00	15.00	139.276	0.010	0.0	0.0	0.5	0.86	6.8	1.9
1.001	50.00	15.00	139.035	0.011	0.0	0.0	0.6	0.86	6.8	2.1
1.002	50.00	15.00	138.858	0.014	0.0	0.0	0.8	0.86	6.8	2.7
1.003	50.00	15.00	138.769	0.022	0.0	0.0	1.2	0.86	6.8	4.2
1.004	50.00	15.00	138.474	0.022	0.0	0.0	1.2	1.22	9.6	4.2
1.005	50.00	15.00	137.980	0.027	0.0	0.0	1.5	2.15	16.9	5.1
2.000	50.00	15.00	139.449	0.030	0.0	0.0	1.6	4.50	35.3	5.7
2.001	50.00	15.00	138.915	0.030	0.0	0.0	1.6	3.18	25.0	5.7
2.002	50.00	15.00	138.403	0.041	0.0	0.0	2.2	1.88	33.2	7.8
3.000	50.00	15.00	138.605	0.016	0.0	0.0	0.9	4.50	35.3	3.0
3.001	50.00	15.00	138.040	0.016	0.0	0.0	0.9	2.46	19.3	3.0
2.003	50.00	15.00	137.745	0.070	0.0	0.0	3.8	1.56	27.5	13.3
2.004	50.00	15.00	137.514	0.083	0.0	0.0	4.5	0.82	14.5«	15.7
1.006	50.00	15.00	137.336	0.126	0.0	0.0	6.8	0.82	14.5«	23.9
4.000	50.00	15.00	137.668	0.000	0.0	0.0	0.0	3.05	54.0	0.0


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Network Design Table for JNP Surface Water Network





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
1.007	27.579	0.217	127.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	3.292	0.549	6.0	0.021	15.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	10.299	0.792	13.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	20.375	1.019	20.0	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	3.039	0.608	5.0	0.019	15.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	4.381	0.438	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.009	22.895	0.739	31.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	5.800	0.264	22.0	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.000	9.461	1.183	8.0	0.009	15.00	0.0	0.600	o	225	Pipe/Conduit	
7.001	18.152	0.275	66.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.000	2.708	1.354	2.0	0.049	15.00	0.0	0.600	o	100	Pipe/Conduit	
7.002	13.307	0.111	120.0	0.000	0.00	0.0	0.600	o	225	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)
1.007	50.00	15.00	137.239	0.126	0.0	0.0	6.8	0.89	15.7«	23.9
5.000	50.00	15.00	138.488	0.021	0.0	0.0	1.1	3.18	25.0	4.0
5.001	50.00	15.00	137.934	0.021	0.0	0.0	1.1	2.15	16.9	4.0
1.008	50.00	15.00	137.022	0.166	0.0	0.0	9.0	2.26	40.0	31.5
6.000	50.00	15.00	137.174	0.019	0.0	0.0	1.0	3.48	27.4	3.6
6.001	50.00	15.00	136.566	0.019	0.0	0.0	1.0	2.46	19.3	3.6
1.009	50.00	15.00	136.003	0.185	0.0	0.0	10.0	1.82	32.1«	35.1
1.010	50.00	15.00	135.264	0.202	0.0	0.0	10.9	2.16	38.1«	38.3
7.000	50.00	15.00	137.558	0.009	0.0	0.0	0.5	4.66	185.1	1.7
7.001	50.00	15.00	136.375	0.009	0.0	0.0	0.5	1.61	64.1	1.7
8.000	50.00	15.00	137.579	0.049	0.0	0.0	2.7	5.51	43.3	9.3
7.002	50.00	15.00	136.100	0.058	0.0	0.0	3.1	1.19	47.4	11.0


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Network Design Table for JNP Surface Water Network

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
7.003	8.600	0.215	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.004	19.357	0.774	25.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	9.000	0.060	150.0	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.012	30.561	0.955	32.0	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)
7.003	50.00	15.00	135.989	0.058	0.0	0.0	3.1	2.07	82.5	11.0
7.004	50.00	15.00	135.774	0.074	0.0	0.0	4.0	2.63	104.5	14.0
1.011	50.00	15.00	135.000	0.305	0.0	0.0	16.5	0.82	14.5«	57.8
1.012	50.00	15.00	134.940	0.305	0.0	0.0	16.5	1.79	31.6«	57.8

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Manhole Schedules for JNP Surface Water Network

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)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	140.250	0.974	Open Manhole	450	1.000	139.276	100				
S2	140.996	1.961	Open Manhole	450	1.001	139.035	100	1.000	139.035	100	
S3	140.600	1.742	Open Manhole	450	1.002	138.858	100	1.001	138.858	100	
S4	140.600	1.831	Open Manhole	450	1.003	138.769	100	1.002	138.769	100	
S5	141.106	2.632	Open Manhole	450	1.004	138.474	100	1.003	138.475	100	1
S6	139.700	1.720	Open Manhole	450	1.005	137.980	100	1.004	137.980	100	
S14	140.136	0.687	Open Manhole	450	2.000	139.449	100				
S15	140.136	1.221	Open Manhole	450	2.001	138.915	100	2.000	138.915	100	
S16	140.021	1.618	Open Manhole	1200	2.002	138.403	150	2.001	138.453	100	
S19	139.275	0.670	Open Manhole	450	3.000	138.605	100				
S20	139.275	1.235	Open Manhole	450	3.001	138.040	100	3.000	138.040	100	
S17	139.244	1.499	Open Manhole	1200	2.003	137.745	150	2.002	137.745	150	
								3.001	137.795	100	
S18	139.015	1.501	Open Manhole	1200	2.004	137.514	150	2.003	137.514	150	
S7	139.394	2.058	Open Manhole	1200	1.006	137.336	150	1.005	137.461	100	75
								2.004	137.411	150	75
S21	139.662	1.994	Open Manhole	1200	4.000	137.668	150				
S8	139.648	2.409	Open Manhole	1200	1.007	137.239	150	1.006	137.239	150	
								4.000	137.239	150	
S23	139.150	0.662	Open Manhole	450	5.000	138.488	100				
S24	139.150	1.216	Open Manhole	450	5.001	137.934	100	5.000	137.939	100	5
S9	138.557	1.535	Open Manhole	1200	1.008	137.022	150	1.007	137.022	150	
								5.001	137.142	100	70
S25	137.800	0.626	Open Manhole	450	6.000	137.174	100				
S26	137.800	1.234	Open Manhole	450	6.001	136.566	100	6.000	136.566	100	
S10	137.624	1.621	Open Manhole	1200	1.009	136.003	150	1.008	136.003	150	
								6.001	136.128	100	75
S50	136.767	1.503	Open Manhole	1200	1.010	135.264	150	1.009	135.264	150	
S27	138.720	1.162	Open Manhole	1200	7.000	137.558	225				
S28	138.364	1.989	Open Manhole	1200	7.001	136.375	225	7.000	136.375	225	
S32	138.500	0.921	Open Manhole	450	8.000	137.579	100				
S29	138.500	2.400	Open Manhole	1200	7.002	136.100	225	7.001	136.100	225	
								8.000	136.225	100	
S30	138.403	2.414	Open Manhole	1200	7.003	135.989	225	7.002	135.989	225	















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Manhole Schedules for JNP Surface Water Network


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)
S31	137.900	2.126	Open Manhole	1200	7.004	135.774	225	7.003	135.774	225	
S11	136.500	1.500	Open Manhole	1200	1.011	135.000	150	1.010	135.000	150	
								7.004	135.000	225	
S12	136.750	1.810	Open Manhole	1200	1.012	134.940	150	1.011	134.940	150	
S13	134.985	1.000	Open Manhole	1200		OUTFALL		1.012	133.985	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	487292.159	226314.922	487292.159	226314.922	Required	
S2	487273.282	226318.974	487281.183	226318.974	Required	
S3	487268.821	226332.400	487268.821	226332.400	Required	
S4	487270.751	226339.251	487270.751	226339.251	Required	
S5	487279.094	226361.200	487279.094	226361.200	Required	
S6	487295.398	226372.367	487295.398	226372.367	Required	
S14	487297.042	226334.181	487297.042	226334.181	Required	
S15	487298.637	226334.029	487298.637	226334.029	Required	
S16	487299.766	226336.557	487299.766	226336.557	Required	
S19	487299.524	226353.815	487299.524	226353.815	Required	









Manhole Schedules for JNP Surface Water Network


MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S20	487299.630	226355.507	487299.630	226355.507	Required	
S17	487302.082	226355.495	487302.082	226355.495	Required	
S18	487304.344	226364.930	487304.344	226364.930	Required	
S7	487297.561	226378.772	487297.561	226378.772	Required	
S21	487302.106	226391.449	487302.106	226391.449	Required	
S8	487306.658	226390.198	487306.658	226390.198	Required	
S23	487320.002	226381.903	487320.002	226381.903	Required	
S24	487323.223	226381.224	487323.223	226381.224	Required	
S9	487333.332	226383.191	487333.332	226383.191	Required	
S25	487344.808	226374.841	487344.808	226374.841	Required	
S26	487347.530	226373.490	487347.530	226373.490	Required	
S10	487351.782	226374.547	487351.782	226374.547	Required	
S50	487367.250	226357.667	487367.250	226357.667	Required	
S27	487337.623	226314.530	487337.623	226314.530	Required	



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Manhole Schedules for JNP Surface Water Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S28	487347.084	226314.505	487347.084	226314.505	Required	
S32	487347.507	226330.731	487347.507	226330.731	Required	
S29	487349.571	226332.485	487349.571	226332.485	Required	
S30	487344.620	226344.837	487344.620	226344.837	Required	
S31	487352.497	226348.289	487352.497	226348.289	Required	
S11	487371.169	226353.391	487371.169	226353.391	Required	
S12	487380.168	226353.492	487380.168	226353.492	Required	
S13	487406.157	226369.573			No Entry	

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PIPELINE SCHEDULES for JNP Surface Water Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	o	100	S1	140.250	139.276	0.874	Open Manhole		450
1.001	o	100	S2	140.996	139.035	1.861	Open Manhole		450
1.002	o	100	S3	140.600	138.858	1.642	Open Manhole		450
1.003	o	100	S4	140.600	138.769	1.731	Open Manhole		450
1.004	o	100	S5	141.106	138.474	2.532	Open Manhole		450
1.005	o	100	S6	139.700	137.980	1.620	Open Manhole		450
2.000	o	100	S14	140.136	139.449	0.587	Open Manhole		450
2.001	o	100	S15	140.136	138.915	1.121	Open Manhole		450
2.002	o	150	S16	140.021	138.403	1.468	Open Manhole		1200
3.000	o	100	S19	139.275	138.605	0.570	Open Manhole		450
3.001	o	100	S20	139.275	138.040	1.135	Open Manhole		450
2.003	o	150	S17	139.244	137.745	1.349	Open Manhole		1200
2.004	o	150	S18	139.015	137.514	1.351	Open Manhole		1200
1.006	o	150	S7	139.394	137.336	1.908	Open Manhole		1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	19.307	80.0	S2	140.996	139.035	1.861	Open Manhole		450
1.001	14.148	80.0	S3	140.600	138.858	1.642	Open Manhole		450
1.002	7.118	80.0	S4	140.600	138.769	1.731	Open Manhole		450
1.003	23.481	80.0	S5	141.106	138.475	2.531	Open Manhole		450
1.004	19.761	40.0	S6	139.700	137.980	1.620	Open Manhole		450
1.005	6.761	13.0	S7	139.394	137.461	1.833	Open Manhole		1200
2.000	1.602	3.0	S15	140.136	138.915	1.121	Open Manhole		450
2.001	2.769	6.0	S16	140.021	138.453	1.468	Open Manhole		1200
2.002	19.079	29.0	S17	139.244	137.745	1.349	Open Manhole		1200
3.000	1.696	3.0	S20	139.275	138.040	1.135	Open Manhole		450
3.001	2.452	10.0	S17	139.244	137.795	1.349	Open Manhole		1200
2.003	9.703	42.0	S18	139.015	137.514	1.351	Open Manhole		1200
2.004	15.415	150.0	S7	139.394	137.411	1.833	Open Manhole		1200
1.006	14.605	150.0	S8	139.648	137.239	2.259	Open Manhole		1200

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PIPELINE SCHEDULES for JNP Surface Water Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
4.000	o	150	S21	139.662	137.668	1.844	Open Manhole	1200	
1.007	o	150	S8	139.648	137.239	2.259	Open Manhole	1200	
5.000	o	100	S23	139.150	138.488	0.562	Open Manhole	450	
5.001	o	100	S24	139.150	137.934	1.116	Open Manhole	450	
1.008	o	150	S9	138.557	137.022	1.385	Open Manhole	1200	
6.000	o	100	S25	137.800	137.174	0.526	Open Manhole	450	
6.001	o	100	S26	137.800	136.566	1.134	Open Manhole	450	
1.009	o	150	S10	137.624	136.003	1.471	Open Manhole	1200	
1.010	o	150	S50	136.767	135.264	1.353	Open Manhole	1200	
7.000	o	225	S27	138.720	137.558	0.937	Open Manhole	1200	
7.001	o	225	S28	138.364	136.375	1.764	Open Manhole	1200	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
4.000	4.721	11.0	S8	139.648	137.239	2.259	Open Manhole	1200	
1.007	27.579	127.0	S9	138.557	137.022	1.385	Open Manhole	1200	
5.000	3.292	6.0	S24	139.150	137.939	1.111	Open Manhole	450	
5.001	10.299	13.0	S9	138.557	137.142	1.315	Open Manhole	1200	
1.008	20.375	20.0	S10	137.624	136.003	1.471	Open Manhole	1200	
6.000	3.039	5.0	S26	137.800	136.566	1.134	Open Manhole	450	
6.001	4.381	10.0	S10	137.624	136.128	1.396	Open Manhole	1200	
1.009	22.895	31.0	S50	136.767	135.264	1.353	Open Manhole	1200	
1.010	5.800	22.0	S11	136.500	135.000	1.350	Open Manhole	1200	
7.000	9.461	8.0	S28	138.364	136.375	1.764	Open Manhole	1200	
7.001	18.152	66.0	S29	138.500	136.100	2.175	Open Manhole	1200	

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PIPELINE SCHEDULES for JNP Surface Water Network

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)
8.000	o	100	S32	138.500	137.579	0.821	Open Manhole	450
7.002	o	225	S29	138.500	136.100	2.175	Open Manhole	1200
7.003	o	225	S30	138.403	135.989	2.189	Open Manhole	1200
7.004	o	225	S31	137.900	135.774	1.901	Open Manhole	1200
1.011	o	150	S11	136.500	135.000	1.350	Open Manhole	1200
1.012	o	150	S12	136.750	134.940	1.660	Open Manhole	1200

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)
8.000	2.708	2.0	S29	138.500	136.225	2.175	Open Manhole	1200
7.002	13.307	120.0	S30	138.403	135.989	2.189	Open Manhole	1200
7.003	8.600	40.0	S31	137.900	135.774	1.901	Open Manhole	1200
7.004	19.357	25.0	S11	136.500	135.000	1.275	Open Manhole	1200
1.011	9.000	150.0	S12	136.750	134.940	1.660	Open Manhole	1200
1.012	30.561	32.0	S13	134.985	133.985	0.850	Open Manhole	1200


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Area Summary for JNP Surface Water Network

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.010	0.010	0.010
1.001	-	-	100	0.001	0.001	0.001
1.002	-	-	100	0.003	0.003	0.003
1.003	-	-	100	0.008	0.008	0.008
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.005	0.005	0.005
2.000	-	-	100	0.030	0.030	0.030
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.011	0.011	0.011
3.000	-	-	100	0.016	0.016	0.016
3.001	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.013	0.013	0.013
2.004	-	-	100	0.013	0.013	0.013
1.006	-	-	100	0.016	0.016	0.016
4.000	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.021	0.021	0.021
5.001	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.019	0.019	0.019
6.000	-	-	100	0.019	0.019	0.019
6.001	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.017	0.017	0.017
7.000	-	-	100	0.009	0.009	0.009
7.001	-	-	100	0.000	0.000	0.000
8.000	-	-	100	0.049	0.049	0.049
7.002	-	-	100	0.000	0.000	0.000
7.003	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.016	0.016	0.016
1.011	-	-	100	0.029	0.029	0.029
1.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.305	0.305	0.305

Free Flowing Outfall Details for JNP Surface Water Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.012	S13	134.985	133.985	134.000	1200	0

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Simulation Criteria for JNP Surface Water Network

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	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 7    Number of Storage Structures 7    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 487382 226367 SP 87382 26367
Data Type	Point
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for JNP Surface Water Network

Orifice Manhole: S15, DS/PN: 2.001, Volume (m<sup>3</sup>): 0.2

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 138.915

Orifice Manhole: S20, DS/PN: 3.001, Volume (m<sup>3</sup>): 0.2

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 138.040


Hydro-Brake® Optimum Manhole: S8, DS/PN: 1.007, Volume (m<sup>3</sup>): 3.0

Unit Reference	MD-SHE-0066-2000-1061-2000
Design Head (m)	1.061
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	66
Invert Level (m)	137.239
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.061	2.0	Kick-Flo®	0.589	1.5
Flush-Flo™	0.291	1.9	Mean Flow over Head Range	-	1.7

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	1.6	1.200	2.1	3.000	3.2	7.000	4.8
0.200	1.8	1.400	2.3	3.500	3.5	7.500	4.9
0.300	1.9	1.600	2.4	4.000	3.7	8.000	5.1
0.400	1.9	1.800	2.5	4.500	3.9	8.500	5.2
0.500	1.8	2.000	2.7	5.000	4.1	9.000	5.4
0.600	1.5	2.200	2.8	5.500	4.3	9.500	5.5
0.800	1.8	2.400	2.9	6.000	4.4		
1.000	1.9	2.600	3.0	6.500	4.6		

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Orifice Manhole: S24, DS/PN: 5.001, Volume (m<sup>3</sup>): 0.2

Diameter (m) 0.031 Discharge Coefficient 0.600 Invert Level (m) 137.934

Orifice Manhole: S26, DS/PN: 6.001, Volume (m<sup>3</sup>): 0.2

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 136.566

Orifice Manhole: S29, DS/PN: 7.002, Volume (m<sup>3</sup>): 3.4

Diameter (m) 0.025 Discharge Coefficient 0.600 Invert Level (m) 136.100

Hydro-Brake® Optimum Manhole: S11, DS/PN: 1.011, Volume (m<sup>3</sup>): 2.5


Unit Reference	MD-SHE-0064-2000-1244-2000
Design Head (m)	1.244
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	64
Invert Level (m)	135.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.244	2.0	Kick-Flo®	0.567	1.4
Flush-Flo™	0.281	1.7	Mean Flow over Head Range	-	1.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	1.200	2.0	3.000	3.0	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.6
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.7
0.400	1.7	1.800	2.4	4.500	3.6	8.500	4.9
0.500	1.6	2.000	2.5	5.000	3.8	9.000	5.0
0.600	1.4	2.200	2.6	5.500	4.0	9.500	5.1
0.800	1.6	2.400	2.7	6.000	4.1		
1.000	1.8	2.600	2.8	6.500	4.3		



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Storage Structures for JNP Surface Water Network

Porous Car Park Manhole: S14, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.5
Membrane Percolation (mm/hr)	1000	Length (m)	11.6
Max Percolation (l/s)	40.3	Slope (1:X)	70.7
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	139.686	Membrane Depth (mm)	0

Porous Car Park Manhole: S19, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	22.2	Slope (1:X)	21.6
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	138.605	Membrane Depth (mm)	0

Cellular Storage Manhole: S21, DS/PN: 4.000

Invert Level (m)	137.700	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		


Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	112.0	0.0	0.801	0.0	17.0
0.800	112.0	16.9			

Porous Car Park Manhole: S23, DS/PN: 5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.0
Max Percolation (l/s)	25.0	Slope (1:X)	45.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	138.550	Membrane Depth (mm)	0

Porous Car Park Manhole: S25, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	137.180
Membrane Percolation (mm/hr)	1000	Width (m)	7.0
Max Percolation (l/s)	19.4	Length (m)	10.0
Safety Factor	2.0	Slope (1:X)	10.3
Porosity	0.30	Depression Storage (mm)	5

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Porous Car Park Manhole: S25, DS/PN: 6.000

Evaporation (mm/day) 3 Membrane Depth (mm) 0


Porous Car Park Manhole: S32, DS/PN: 8.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.4
Membrane Percolation (mm/hr)	1000	Length (m)	33.0
Max Percolation (l/s)	77.0	Slope (1:X)	51.2
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	137.650	Membrane Depth (mm)	0

Cellular Storage Manhole: S11, DS/PN: 1.011

Invert Level (m)	135.300	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	160.0	0.0	1.001	0.0	0.0
1.000	160.0	0.0			

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for  
JNP Surface Water Network

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	0.000
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 7    Number of Storage Structures 7    Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 487382 226367 SP 87382 26367
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840
Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water
									Level (m)
1.000	S1	30 Winter	2	+0%	100/15 Summer				139.300
1.001	S2	30 Winter	2	+0%	100/15 Summer				139.060
1.002	S3	15 Winter	2	+0%	100/15 Summer				138.889
1.003	S4	15 Winter	2	+0%	100/15 Summer				138.810
1.004	S5	15 Winter	2	+0%	100/15 Summer				138.508
1.005	S6	15 Winter	2	+0%	30/15 Summer				138.010
2.000	S14	30 Winter	2	+0%	2/15 Summer				139.738
2.001	S15	30 Winter	2	+0%	2/15 Summer				139.757
2.002	S16	30 Winter	2	+0%	100/15 Summer				138.433
3.000	S19	30 Winter	2	+0%	30/15 Summer				138.622
3.001	S20	30 Winter	2	+0%	2/15 Summer				138.564
2.003	S17	30 Winter	2	+0%	2/15 Summer				137.945

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for  
JNP Surface Water Network


PN	US/MH Name	Surcharged Flooded			Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)					
1.000	S1	-0.076	0.000	0.13		0.9	OK		
1.001	S2	-0.075	0.000	0.15		0.9	OK		
1.002	S3	-0.069	0.000	0.20		1.3	OK		
1.003	S4	-0.059	0.000	0.35		2.3	OK		
1.004	S5	-0.066	0.000	0.25		2.3	OK		
1.005	S6	-0.070	0.000	0.19		2.9	OK		
2.000	S14	0.189	0.000	0.09		7 1.9	SURCHARGED		
2.001	S15	0.742	0.000	0.09		1.7	SURCHARGED		
2.002	S16	-0.120	0.000	0.09		2.7	OK		
3.000	S19	-0.083	0.000	0.07		11 1.4	OK		
3.001	S20	0.424	0.000	0.10		1.3	SURCHARGED		
2.003	S17	0.050	0.000	0.20		4.9	SURCHARGED		

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for  
JNP Surface Water Network


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
2.004	S18	30	Winter	2	+0%	2/15	Summer		137.928
1.006	S7	30	Winter	2	+0%	2/15	Summer		137.902
4.000	S21	120	Winter	2	+0%	30/15	Winter		137.781
1.007	S8	30	Winter	2	+0%	2/15	Summer		137.851
5.000	S23	30	Winter	2	+0%	30/15	Summer		138.576
5.001	S24	30	Winter	2	+0%	2/15	Summer		138.569
1.008	S9	30	Winter	2	+0%				137.058
6.000	S25	30	Winter	2	+0%	30/15	Summer		137.223
6.001	S26	30	Winter	2	+0%	2/15	Summer		137.218
1.009	S10	30	Winter	2	+0%	100/360	Winter		136.049
1.010	S50	360	Winter	2	+0%	2/60	Winter		135.553
7.000	S27	30	Winter	2	+0%	30/15	Winter		137.563
7.001	S28	120	Winter	2	+0%	2/15	Summer		137.496
8.000	S32	30	Winter	2	+0%	30/15	Summer		137.604
7.002	S29	120	Winter	2	+0%	2/15	Summer		137.495
7.003	S30	120	Winter	2	+0%	100/960	Winter		136.012
7.004	S31	15	Winter	2	+0%	100/240	Summer		135.798
1.011	S11	360	Winter	2	+0%	2/15	Summer		135.550
1.012	S12	1440	Winter	2	+0%				134.963

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
2.004	S18	0.264	0.000	0.45		6.0	SURCHARGED	
1.006	S7	0.416	0.000	0.72		9.6	SURCHARGED	
4.000	S21	-0.037	0.000	0.04		63	1.7	OK
1.007	S8	0.462	0.000	0.12			1.9	SURCHARGED
5.000	S23	-0.012	0.000	0.08		5	1.7	OK
5.001	S24	0.535	0.000	0.10			1.6	SURCHARGED
1.008	S9	-0.114	0.000	0.13			5.0	OK
6.000	S25	-0.051	0.000	0.07		4	1.6	OK
6.001	S26	0.552	0.000	0.09			1.5	SURCHARGED
1.009	S10	-0.104	0.000	0.21			6.3	OK
1.010	S50	0.139	0.000	0.12			3.7	SURCHARGED
7.000	S27	-0.220	0.000	0.01			0.8	OK
7.001	S28	0.896	0.000	0.01			0.6	SURCHARGED
8.000	S32	-0.075	0.000	0.13		15	4.2	OK
7.002	S29	1.170	0.000	0.04			1.5	SURCHARGED
7.003	S30	-0.202	0.000	0.02			1.5	OK
7.004	S31	-0.201	0.000	0.03			2.4	OK
1.011	S11	0.400	0.000	0.13		212	1.7	SURCHARGED

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for  
JNP Surface Water Network

PN	US/MH Name	Surcharged Flooded		Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Time (mins)		
1.012	S12	-0.127	0.000	0.06		1.7	OK

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

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	0.000
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 7    Number of Storage Structures 7    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 487382 226367 SP 87382 26367
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840
Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water
									Level (m)
1.000	S1	30 Winter	30	+0%	100/15 Summer				139.313
1.001	S2	30 Winter	30	+0%	100/15 Summer				139.074
1.002	S3	15 Winter	30	+0%	100/15 Summer				138.908
1.003	S4	15 Winter	30	+0%	100/15 Summer				138.844
1.004	S5	15 Winter	30	+0%	100/15 Summer				138.532
1.005	S6	15 Winter	30	+0%	30/15 Summer				138.319
2.000	S14	30 Winter	30	+0%	2/15 Summer				139.839
2.001	S15	30 Winter	30	+0%	2/15 Summer				139.863
2.002	S16	15 Winter	30	+0%	100/15 Summer				138.447
3.000	S19	30 Winter	30	+0%	30/15 Summer				138.808
3.001	S20	30 Winter	30	+0%	2/15 Summer				138.824
2.003	S17	15 Winter	30	+0%	2/15 Summer				138.325

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

PN	US/MH Name	Surcharged Flooded			Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)					
1.000	S1	-0.063	0.000	0.30		1.9	OK		
1.001	S2	-0.061	0.000	0.32		2.1	OK		
1.002	S3	-0.050	0.000	0.48		2.9	OK		
1.003	S4	-0.025	0.000	0.88		5.8	OK		
1.004	S5	-0.042	0.000	0.63		5.8	OK		
1.005	S6	0.239	0.000	0.46		7.1	SURCHARGED		
2.000	S14	0.290	0.000	0.11		20	2.3	FLOOD RISK	
2.001	S15	0.848	0.000	0.09			1.8	FLOOD RISK	
2.002	S16	-0.106	0.000	0.17			5.4	OK	
3.000	S19	0.103	0.000	0.09		11	1.9	SURCHARGED	
3.001	S20	0.684	0.000	0.12			1.6	SURCHARGED	
2.003	S17	0.430	0.000	0.37			9.0	SURCHARGED	




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


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
2.004	S18	15 Winter	30	+0%	2/15 Summer				138.294
1.006	S7	15 Winter	30	+0%	2/15 Summer				138.212
4.000	S21	120 Winter	30	+0%	30/15 Winter				137.946
1.007	S8	120 Winter	30	+0%	2/15 Summer				137.951
5.000	S23	30 Winter	30	+0%	30/15 Summer				138.707
5.001	S24	30 Winter	30	+0%	2/15 Summer				138.721
1.008	S9	15 Winter	30	+0%					137.076
6.000	S25	30 Winter	30	+0%	30/15 Summer				137.520
6.001	S26	30 Winter	30	+0%	2/15 Summer				137.529
1.009	S10	15 Winter	30	+0%	100/360 Winter				136.068
1.010	S50	960 Winter	30	+0%	2/60 Winter				135.795
7.000	S27	120 Winter	30	+0%	30/15 Winter				137.932
7.001	S28	120 Winter	30	+0%	2/15 Summer				137.932
8.000	S32	120 Winter	30	+0%	30/15 Summer				137.936
7.002	S29	120 Winter	30	+0%	2/15 Summer				137.931
7.003	S30	120 Winter	30	+0%	100/960 Winter				136.013
7.004	S31	15 Winter	30	+0%	100/240 Summer				135.813
1.011	S11	960 Winter	30	+0%	2/15 Summer				135.791
1.012	S12	1440 Winter	30	+0%					134.963

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
2.004	S18	0.630	0.000	0.91		12.1	SURCHARGED	
1.006	S7	0.726	0.000	1.71		22.8	SURCHARGED	
4.000	S21	0.128	0.000	0.04		1.6	SURCHARGED	
1.007	S8	0.562	0.000	0.12		1.9	SURCHARGED	
5.000	S23	0.119	0.000	0.10	15	2.1	SURCHARGED	
5.001	S24	0.687	0.000	0.11		1.7	SURCHARGED	
1.008	S9	-0.096	0.000	0.27		10.0	OK	
6.000	S25	0.246	0.000	0.09	12	1.9	FLOOD RISK	
6.001	S26	0.863	0.000	0.11		1.8	FLOOD RISK	
1.009	S10	-0.085	0.000	0.38		11.4	OK	
1.010	S50	0.381	0.000	0.11		3.3	SURCHARGED	
7.000	S27	0.149	0.000	0.01		0.9	SURCHARGED	
7.001	S28	1.332	0.000	0.02		1.0	SURCHARGED	
8.000	S32	0.257	0.000	0.15	49	4.9	SURCHARGED	
7.002	S29	1.606	0.000	0.04		1.8	SURCHARGED	
7.003	S30	-0.201	0.000	0.03		1.8	OK	
7.004	S31	-0.186	0.000	0.07		6.5	OK	
1.011	S11	0.641	0.000	0.13	516	1.7	SURCHARGED	

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

PN	US/MH Name	Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.012	S12	-0.127	0.000	0.06			1.7	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for JNP Surface Water Network

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	0.000
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 7    Number of Storage Structures 7    Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 487382 226367 SP 87382 26367
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840
Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	15 Winter	100	+40%	100/15 Summer				139.690
1.001	S2	15 Winter	100	+40%	100/15 Summer				139.642
1.002	S3	15 Winter	100	+40%	100/15 Summer				139.600
1.003	S4	15 Winter	100	+40%	100/15 Summer				139.557
1.004	S5	15 Winter	100	+40%	100/15 Summer				139.180
1.005	S6	15 Winter	100	+40%	30/15 Summer				138.893
2.000	S14	60 Winter	100	+40%	2/15 Summer				139.959
2.001	S15	60 Winter	100	+40%	2/15 Summer				139.984
2.002	S16	15 Winter	100	+40%	100/15 Summer				138.936
3.000	S19	30 Winter	100	+40%	30/15 Summer				138.988
3.001	S20	30 Winter	100	+40%	2/15 Summer				139.004
2.003	S17	15 Winter	100	+40%	2/15 Summer				138.907

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
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PN	US/MH Name	Surcharged Flooded			Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)					
1.000	S1	0.314	0.000	0.58		3.8	SURCHARGED		
1.001	S2	0.507	0.000	0.75		4.8	SURCHARGED		
1.002	S3	0.642	0.000	0.90		5.5	SURCHARGED		
1.003	S4	0.688	0.000	1.16		7.6	SURCHARGED		
1.004	S5	0.606	0.000	0.80		7.4	SURCHARGED		
1.005	S6	0.813	0.000	0.61		9.3	SURCHARGED		
2.000	S14	0.410	0.000	0.10	48	2.0	FLOOD RISK		
2.001	S15	0.969	0.000	0.10		1.9	FLOOD RISK		
2.002	S16	0.383	0.000	0.21		6.6	SURCHARGED		
3.000	S19	0.283	0.000	0.09	24	1.9	FLOOD RISK		
3.001	S20	0.864	0.000	0.13		1.8	FLOOD RISK		
2.003	S17	1.012	0.000	0.48		11.7	SURCHARGED		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for JNP Surface Water Network

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
2.004	S18	15 Winter	100	+40%	2/15 Summer				138.859
1.006	S7	15 Winter	100	+40%	2/15 Summer				138.694
4.000	S21	240 Winter	100	+40%	30/15 Winter				138.248
1.007	S8	240 Winter	100	+40%	2/15 Summer				138.251
5.000	S23	30 Winter	100	+40%	30/15 Summer				138.824
5.001	S24	30 Winter	100	+40%	2/15 Summer				138.840
1.008	S9	15 Winter	100	+40%					137.091
6.000	S25	30 Winter	100	+40%	30/15 Summer				137.770
6.001	S26	30 Winter	100	+40%	2/15 Summer				137.784
1.009	S10	960 Winter	100	+40%	100/360 Winter				136.234
1.010	S50	960 Winter	100	+40%	2/60 Winter				136.225
7.000	S27	120 Winter	100	+40%	30/15 Winter				138.168
7.001	S28	120 Winter	100	+40%	2/15 Summer				138.168
8.000	S32	120 Winter	100	+40%	30/15 Summer				138.172
7.002	S29	120 Winter	100	+40%	2/15 Summer				138.167
7.003	S30	960 Winter	100	+40%	100/960 Winter				136.221
7.004	S31	960 Winter	100	+40%	100/240 Summer				136.221
1.011	S11	960 Winter	100	+40%	2/15 Summer				136.221
1.012	S12	960 Winter	100	+40%					134.965

PN	US/MH Name	Surcharged Flooded			Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)				
2.004	S18	1.195	0.000	1.29		17.2 FLOOD RISK		
1.006	S7	1.208	0.000	2.52		33.6 SURCHARGED		
4.000	S21	0.430	0.000	0.04		1.8 SURCHARGED		
1.007	S8	0.862	0.000	0.13		2.0 SURCHARGED		
5.000	S23	0.236	0.000	0.12	27	2.4 SURCHARGED		
5.001	S24	0.806	0.000	0.12		1.9 SURCHARGED		
1.008	S9	-0.081	0.000	0.43		16.4 OK		
6.000	S25	0.496	0.000	0.10	22	2.2 FLOOD RISK		
6.001	S26	1.118	0.000	0.12		2.0 FLOOD RISK		
1.009	S10	0.081	0.000	0.13		3.9 SURCHARGED		
1.010	S50	0.811	0.000	0.14		4.5 SURCHARGED		
7.000	S27	0.385	0.000	0.01		1.6 SURCHARGED		
7.001	S28	1.568	0.000	0.02		1.3 FLOOD RISK		
8.000	S32	0.493	0.000	0.16	94	5.3 SURCHARGED		
7.002	S29	1.842	0.000	0.05		1.9 SURCHARGED		
7.003	S30	0.007	0.000	0.03		1.7 SURCHARGED		
7.004	S31	0.222	0.000	0.02		2.3 SURCHARGED		
1.011	S11	1.071	0.000	0.16	946	2.0 FLOOD RISK		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for JNP Surface Water Network

PN	US/MH Name	Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)				
1.012	S12	-0.125	0.000	0.07			2.0	OK	