

APPENDIX D

OUTLINE DEVELOPMENT SURFACE WATER DRAINAGE CALCULATIONS

C & A Consulting Limited		Page 1
	Greenfield Run-off SW Outfall 1	
Date 27/02/ 2014 File	Designed by TL Checked by GAC	
Micro Drainage		Source Control W.12.6.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 SAAR (mm) 782 Urban 0.000 Area (ha) 1.406 Soil 0.400 Region Number Region 7 Results l/s QBAR Rural 5.4 QBAR Urban 5.4 Q100 years 17.4 Q1 year 4.6 Q30 years 12.3 Q100 years 17.4		
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	Land West of Horndean rd Greenfield Run-off SW Outfall 2	
Date 27/02/2014 File	Designed by TL Checked by GAC	
Micro Drainage		Source Control W.12.6.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 SAAR (mm) 782 Urban 0.000 Area (ha) 2.319 Soil 0.400 Region Number Region 7 Results l/s QBAR Rural 9.0 QBAR Urban 9.0 Q100 years 28.7 Q1 year 7.6 Q30 years 20.4 Q100 years 28.7		
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	Land at Southleigh Farm Greenfield Run-Off SW Outfall 3	
Date 27/02/2014 File	Designed by TL Checked by GAC	
Micro Drainage		Source Control W.12.6.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 SAAR (mm) 782 Urban 0.000 Area (ha) 0.776 Soil 0.400 Region Number Region 7 Results 1/s QBAR Rural 3.0 QBAR Urban 3.0 Q100 years 9.6 Q1 year 2.6 Q30 years 6.8 Q100 years 9.6		
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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions		
Network 2013.1.1		

Surcharged Outfall Details for 13-022 SW-Net Outfall 1.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.005	S7	10.340	9.144	9.144	1200	900
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Datum (m) 0.000 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)	Time (mins)	Depth (m)
1	0.000	37	0.000	73	0.000	109	0.000	145	0.000	181	0.000	217	0.000
2	0.000	38	0.000	74	0.000	110	0.000	146	0.000	182	0.000	218	0.000
3	0.000	39	0.000	75	0.000	111	0.000	147	0.000	183	0.000	219	0.000
4	0.000	40	0.000	76	0.000	112	0.000	148	0.000	184	0.000	220	0.000
5	0.000	41	0.000	77	0.000	113	0.000	149	0.000	185	0.000	221	0.000
6	0.000	42	0.000	78	0.000	114	0.000	150	0.000	186	0.000	222	0.000
7	0.000	43	0.000	79	0.000	115	0.000	151	0.000	187	0.000	223	0.000
8	0.000	44	0.000	80	0.000	116	0.000	152	0.000	188	0.000	224	0.000
9	0.000	45	0.000	81	0.000	117	0.000	153	0.000	189	0.000	225	0.000
10	0.000	46	0.000	82	0.000	118	0.000	154	0.000	190	0.000	226	0.000
11	0.000	47	0.000	83	0.000	119	0.000	155	0.000	191	0.000	227	0.000
12	0.000	48	0.000	84	0.000	120	0.000	156	0.000	192	0.000	228	0.000
13	0.000	49	0.000	85	0.000	121	0.000	157	0.000	193	0.000	229	0.000
14	0.000	50	0.000	86	0.000	122	0.000	158	0.000	194	0.000	230	0.000
15	0.000	51	0.000	87	0.000	123	0.000	159	0.000	195	0.000	231	0.000
16	0.000	52	0.000	88	0.000	124	0.000	160	0.000	196	0.000	232	0.000
17	0.000	53	0.000	89	0.000	125	0.000	161	0.000	197	0.000	233	0.000
18	0.000	54	0.000	90	0.000	126	0.000	162	0.000	198	0.000	234	0.000
19	0.000	55	0.000	91	0.000	127	0.000	163	0.000	199	0.000	235	0.000
20	0.000	56	0.000	92	0.000	128	0.000	164	0.000	200	0.000	236	0.000
21	0.000	57	0.000	93	0.000	129	0.000	165	0.000	201	0.000	237	0.000
22	0.000	58	0.000	94	0.000	130	0.000	166	0.000	202	0.000	238	0.000
23	0.000	59	0.000	95	0.000	131	0.000	167	0.000	203	0.000	239	0.000
24	0.000	60	0.000	96	0.000	132	0.000	168	0.000	204	0.000	240	0.000
25	0.000	61	0.000	97	0.000	133	0.000	169	0.000	205	0.000	241	0.000
26	0.000	62	0.000	98	0.000	134	0.000	170	0.000	206	0.000	242	0.000
27	0.000	63	0.000	99	0.000	135	0.000	171	0.000	207	0.000	243	0.000
28	0.000	64	0.000	100	0.000	136	0.000	172	0.000	208	0.000	244	0.000
29	0.000	65	0.000	101	0.000	137	0.000	173	0.000	209	0.000	245	0.000
30	0.000	66	0.000	102	0.000	138	0.000	174	0.000	210	0.000	246	0.000
31	0.000	67	0.000	103	0.000	139	0.000	175	0.000	211	0.000	247	0.000
32	0.000	68	0.000	104	0.000	140	0.000	176	0.000	212	0.000	248	0.000
33	0.000	69	0.000	105	0.000	141	0.000	177	0.000	213	0.000	249	0.000
34	0.000	70	0.000	106	0.000	142	0.000	178	0.000	214	0.000	250	0.000
35	0.000	71	0.000	107	0.000	143	0.000	179	0.000	215	0.000	251	0.000
36	0.000	72	0.000	108	0.000	144	0.000	180	0.000	216	0.000	252	0.000

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4l/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Online Controls for 13-022 SW-Net Outfall 1.sws

Depth/Flow Relationship Manhole: S6, DS/PN: 1.005, Volume (m³): 13.6

Invert Level (m) 9.166

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6000	0.500	4.6000	0.900	4.6000	1.200	12.3000
0.150	4.6000	0.600	4.6000	1.000	12.3000	1.300	12.3000
0.200	4.6000	0.650	4.6000	1.050	12.3000	1.400	12.3000
0.250	4.6000	0.700	4.6000	1.090	12.3000	1.500	12.3000
0.300	4.6000	0.750	4.6000	1.100	12.3000	1.600	12.3000
0.350	4.6000	0.780	4.6000	1.150	12.3000		
0.400	4.6000	0.800	4.6000	1.160	12.3000		

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<u>Storage Structures for 13-022 SW-Net Outfall 1.sws</u> <u>Porous Car Park Manhole: S9, DS/PN: 3.000</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>13.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>21.2</td></tr><tr><td>Max Percolation (l/s)</td><td>344.5</td><td>Slope (1:X)</td><td>150.0</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>10.400</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table> <u>Tank or Pond Manhole: S11, DS/PN: 5.000</u> Invert Level (m) 9.800 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>244.1</td><td>0.200</td><td>300.3</td><td>0.400</td><td>360.5</td><td>0.600</td><td>424.7</td></tr><tr><td>0.100</td><td>271.7</td><td>0.300</td><td>329.9</td><td>0.500</td><td>392.1</td><td></td><td></td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0	Membrane Percolation (mm/hr)	4500	Length (m)	21.2	Max Percolation (l/s)	344.5	Slope (1:X)	150.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	10.400	Cap Volume Depth (m)	0.000	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	244.1	0.200	300.3	0.400	360.5	0.600	424.7	0.100	271.7	0.300	329.9	0.500	392.1		
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0																																															
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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4l/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 1.sws

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.500
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 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%	30/15	Summer			
2.000	15 Winter	1	0%	30/15	Summer			
1.001	60 Winter	1	0%	30/15	Summer			
3.000	60 Winter	1	0%	30/15	Summer			
1.002	60 Winter	1	0%	30/15	Summer			
4.000	60 Winter	1	0%	30/15	Summer			
1.003	60 Winter	1	0%	1/30	Summer			
1.004	60 Winter	1	0%	1/15	Winter			
5.000	120 Winter	1	0%					
1.005	60 Winter	1	0%	1/15	Summer			

PN	US/MH Name	Water Level (m)	Flooded Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	S1	10.224	-0.137	0.000	0.32	0.0	11.7	OK
2.000	S8	10.218	-0.131	0.000	0.37	0.0	13.2	OK
1.001	S2	10.014	-0.219	0.000	0.12	0.0	17.2	OK

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 1.sws

PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
3.000	S9	10.011	-0.093	0.000	0.07	0.0	2.5	OK
1.002	S3	10.010	-0.001	0.000	0.23	0.0	24.0	OK
4.000	S10	9.980	-0.004	0.000	0.10	0.0	3.7	OK
1.003	S4	9.977	0.101	0.000	0.14	0.0	27.8	SURCHARGED
1.004	S5	9.971	0.199	0.000	0.09	0.0	17.6	SURCHARGED
5.000	S11	9.871	-0.379	0.000	0.01	0.0	4.0	OK
1.005	S6	9.965	0.349	0.000	0.04	0.0	4.6	SURCHARGED

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XP Solutions	Network 2013.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 1.sws

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
		Level (m)		Volume (m³)			Flow (l/s)	
3.000	S9	10.469	0.365	0.000	0.33	0.0	11.5	SURCHARGED
1.002	S3	10.490	0.479	0.000	0.89	0.0	93.0	SURCHARGED
4.000	S10	10.479	0.495	0.000	0.46	0.0	16.4	SURCHARGED
1.003	S4	10.416	0.540	0.000	0.50	0.0	96.6	SURCHARGED
1.004	S5	10.375	0.603	0.000	0.37	0.0	70.2	SURCHARGED
5.000	S11	10.141	-0.109	0.000	0.01	0.0	5.4	FLOOD RISK
1.005	S6	10.328	0.712	0.000	0.10	0.0	12.3	FLOOD RISK

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4l/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Surcharged Outfall Details for 13-022 SW-Net Outfall 1.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.005	S7	10.340	9.144	9.144	1200	900
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Datum (m) 0.000 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)	Time (mins)	Depth (m)
5	0.105	185	0.105	365	0.105	545	0.105	725	0.105	905	0.105	1085	0.105
10	0.105	190	0.105	370	0.105	550	0.105	730	0.105	910	0.105	1090	0.105
15	0.105	195	0.105	375	0.105	555	0.105	735	0.105	915	0.105	1095	0.105
20	0.105	200	0.105	380	0.105	560	0.105	740	0.105	920	0.105	1100	0.105
25	0.105	205	0.105	385	0.105	565	0.105	745	0.105	925	0.105	1105	0.105
30	0.105	210	0.105	390	0.105	570	0.105	750	0.105	930	0.105	1110	0.105
35	0.105	215	0.105	395	0.105	575	0.105	755	0.105	935	0.105	1115	0.105
40	0.105	220	0.105	400	0.105	580	0.105	760	0.105	940	0.105	1120	0.105
45	0.105	225	0.105	405	0.105	585	0.105	765	0.105	945	0.105	1125	0.105
50	0.105	230	0.105	410	0.105	590	0.105	770	0.105	950	0.105	1130	0.105
55	0.105	235	0.105	415	0.105	595	0.105	775	0.105	955	0.105	1135	0.105
60	0.105	240	0.105	420	0.105	600	0.105	780	0.105	960	0.105	1140	0.105
65	0.105	245	0.105	425	0.105	605	0.105	785	0.105	965	0.105	1145	0.105
70	0.105	250	0.105	430	0.105	610	0.105	790	0.105	970	0.105	1150	0.105
75	0.105	255	0.105	435	0.105	615	0.105	795	0.105	975	0.105	1155	0.105
80	0.105	260	0.105	440	0.105	620	0.105	800	0.105	980	0.105	1160	0.105
85	0.105	265	0.105	445	0.105	625	0.105	805	0.105	985	0.105	1165	0.105
90	0.105	270	0.105	450	0.105	630	0.105	810	0.105	990	0.105	1170	0.105
95	0.105	275	0.105	455	0.105	635	0.105	815	0.105	995	0.105	1175	0.105
100	0.105	280	0.105	460	0.105	640	0.105	820	0.105	1000	0.105	1180	0.105
105	0.105	285	0.105	465	0.105	645	0.105	825	0.105	1005	0.105	1185	0.105
110	0.105	290	0.105	470	0.105	650	0.105	830	0.105	1010	0.105	1190	0.105
115	0.105	295	0.105	475	0.105	655	0.105	835	0.105	1015	0.105	1195	0.105
120	0.105	300	0.105	480	0.105	660	0.105	840	0.105	1020	0.105	1200	0.105
125	0.105	305	0.105	485	0.105	665	0.105	845	0.105	1025	0.105	1205	0.105
130	0.105	310	0.105	490	0.105	670	0.105	850	0.105	1030	0.105	1210	0.105
135	0.105	315	0.105	495	0.105	675	0.105	855	0.105	1035	0.105	1215	0.105
140	0.105	320	0.105	500	0.105	680	0.105	860	0.105	1040	0.105	1220	0.105
145	0.105	325	0.105	505	0.105	685	0.105	865	0.105	1045	0.105	1225	0.105
150	0.105	330	0.105	510	0.105	690	0.105	870	0.105	1050	0.105	1230	0.105
155	0.105	335	0.105	515	0.105	695	0.105	875	0.105	1055	0.105	1235	0.105
160	0.105	340	0.105	520	0.105	700	0.105	880	0.105	1060	0.105	1240	0.105
165	0.105	345	0.105	525	0.105	705	0.105	885	0.105	1065	0.105	1245	0.105
170	0.105	350	0.105	530	0.105	710	0.105	890	0.105	1070	0.105	1250	0.105
175	0.105	355	0.105	535	0.105	715	0.105	895	0.105	1075	0.105	1255	0.105
180	0.105	360	0.105	540	0.105	720	0.105	900	0.105	1080	0.105	1260	0.105

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XP Solutions	Network 2013.1.1	

Surcharged Outfall Details for 13-022 SW-Net Outfall 1.sws

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1265	0.105	1295	0.105	1325	0.105	1355	0.105	1385	0.105	1415	0.105		
1270	0.105	1300	0.105	1330	0.105	1360	0.105	1390	0.105	1420	0.105		
1275	0.105	1305	0.105	1335	0.105	1365	0.105	1395	0.105	1425	0.105		
1280	0.105	1310	0.105	1340	0.105	1370	0.105	1400	0.105	1430	0.105		
1285	0.105	1315	0.105	1345	0.105	1375	0.105	1405	0.105	1435	0.105		
1290	0.105	1320	0.105	1350	0.105	1380	0.105	1410	0.105	1440	0.105		

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4l/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Online Controls for 13-022 SW-Net Outfall 1.sws

Depth/Flow Relationship Manhole: S6, DS/PN: 1.005, Volume (m³): 13.6

Invert Level (m) 9.166

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6000	0.500	4.6000	0.900	4.6000	1.200	17.4000
0.150	4.6000	0.600	4.6000	1.000	12.3000	1.300	17.4000
0.200	4.6000	0.650	4.6000	1.050	12.3000	1.400	17.4000
0.250	4.6000	0.700	4.6000	1.090	12.3000	1.500	17.4000
0.300	4.6000	0.750	4.6000	1.100	12.3000	1.600	17.4000
0.350	4.6000	0.780	4.6000	1.162	12.3000		
0.400	4.6000	0.800	4.6000	1.170	17.4000		

C & A Consulting Engineers Ltd		Page 6
Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Chidden Farm Horndean Road SW Network 1 - 17.4l/s	
Date 22-Apr-14 File 13-022 SW Network 1.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 1.sws

PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
3.000	S9	10.586	0.482	0.000	0.69	0.0	24.3	SURCHARGED
1.002	S3	10.666	0.655	0.000	0.92	0.0	95.9	FLOOD RISK
4.000	S10	10.640	0.656	0.000	0.75	0.0	26.6	FLOOD RISK
1.003	S4	10.535	0.659	0.000	0.81	0.0	158.2	SURCHARGED
1.004	S5	10.458	0.686	0.000	0.82	0.0	154.5	FLOOD RISK
5.000	S11	10.383	0.133	0.000	0.03	0.0	14.2	FLOOD RISK
1.005	S6	10.384	0.768	0.000	0.14	0.0	17.3	FLOOD RISK

Existing Network Details for 13-022 SW-Net Outfall 2.sws

		PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	
		1.000	20.319	0.120	169.3	0.055	4.00	0.600	o	225	
		1.001	30.598	0.180	170.0	0.076	0.00	0.600	o	225	
		2.000	27.363	0.161	170.0	0.091	4.00	0.600	o	225	
		1.002	45.819	0.191	239.9	0.042	0.00	0.600	o	375	
		3.000	31.253	0.130	240.4	0.083	4.00	0.600	o	300	
		1.003	43.344	0.135	321.1	0.103	0.00	0.600	o	450	
		1.004	41.956	0.103	407.3	0.041	0.00	0.600	o	450	
		1.005	15.506	0.038	408.1	0.068	0.00	0.600	o	450	
		1.006	12.794	0.040	319.9	0.064	0.00	0.600	o	375	
		1.007	11.586	0.022	526.6	0.037	0.00	0.600	✓	-1	
		1.008	14.670	0.028	523.9	0.000	0.00	0.600	✓	-1	
		1.009	21.365	0.041	521.1	0.023	0.00	0.600	✓	-1	
		1.010	22.119	0.042	526.6	0.018	0.00	0.600	✓	-1	
		1.011	14.153	0.020	707.7	0.020	0.00	0.600	✓	-1	
		1.012	9.212	0.036	255.9	0.000	0.00	0.600	o	375	
		4.000	26.169	0.154	169.9	0.054	4.00	0.600	o	225	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)		Ctrl		US/MH (mm)
1.000	S13	11.731	10.005	1.501	11.575	9.885	1.465				1200
1.001	S14	11.575	9.885	1.465	11.199	9.705	1.269				1200
2.000	S29	11.419	9.866	1.328	11.199	9.705	1.269				1200
1.002	S15	11.199	9.555	1.269	10.686	9.364	0.947				1500
3.000	S30	10.974	9.569	1.105	10.686	9.439	0.947				1200
1.003	S16	10.686	9.289	0.947	10.890	9.154	1.286	Hydro-Brake®			1500
1.004	S17	10.890	9.154	1.286	10.487	9.051	0.986				1500
1.005	S18	10.487	9.051	0.986	10.306	9.013	0.843				1500
1.006	S19	10.306	9.013	0.918	10.402	8.973	1.054	Hydro-Brake®			1500
1.007	S20	10.402	8.848	1.054	10.471	8.826	1.145				0
1.008	S21	10.471	8.826	1.145	10.599	8.798	1.301				0
1.009	S22	10.599	8.798	1.301	10.797	8.757	1.540				0
1.010	S23	10.797	8.757	1.540	10.842	8.715	1.627				0
1.011	S24	10.842	8.715	1.627	10.757	8.695	1.562				0
1.012	S25	10.757	8.695	1.687	10.657	8.659	1.623				0
4.000	S31	10.219	9.128	0.866	10.482	8.974	1.283				1240 x 675

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Office 19, Hart House

Priestley Rd Basingstoke

Hants RG24 9PU

Date 13-Mar-14

File 13-022 SW Network 2.mdx

XP Solutions

Land at Southleigh Farm

Horndean Road - Greenfield RO

Network 2 - Max Q 7.6l/s

Designed by TL

Checked by

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Network 2013.1.1

Online Controls for 13-022 SW-Net Outfall 2.sws

Hydro-Brake® Manhole: S16, DS/PN: 1.003, Volume (m³): 9.5

Design Head (m) 1.300 Hydro-Brake® Type Md7 Invert Level (m) 9.289

Design Flow (l/s) 50.0 Diameter (mm) 254

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	1.200	47.7	3.000	75.4	7.000	115.2
0.200	18.0	1.400	51.5	3.500	81.5	7.500	119.2
0.300	28.2	1.600	55.1	4.000	87.1	8.000	123.2
0.400	29.7	1.800	58.4	4.500	92.4	8.500	126.9
0.500	30.8	2.000	61.6	5.000	97.4	9.000	130.6
0.600	33.7	2.200	64.6	5.500	102.1	9.500	134.2
0.800	38.9	2.400	67.5	6.000	106.7		
1.000	43.5	2.600	70.2	6.500	111.0		

Hydro-Brake® Manhole: S19, DS/PN: 1.006, Volume (m³): 4.5

Design Head (m) 1.200 Hydro-Brake® Type Md7 Invert Level (m) 9.013

Design Flow (l/s) 85.0 Diameter (mm) 339

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	85.0	3.000	134.3	7.000	205.2
0.200	24.1	1.400	91.8	3.500	145.1	7.500	212.4
0.300	43.2	1.600	98.1	4.000	155.1	8.000	219.4
0.400	58.0	1.800	104.1	4.500	164.5	8.500	226.1
0.500	62.6	2.000	109.7	5.000	173.4	9.000	232.7
0.600	60.6	2.200	115.0	5.500	181.9	9.500	239.1
0.800	69.4	2.400	120.2	6.000	190.0		
1.000	77.6	2.600	125.1	6.500	197.7		

Depth/Flow Relationship Manhole: S27, DS/PN: 1.014, Volume (m³): 19.4

Invert Level (m) 8.429

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6000	0.400	7.6000	0.800	7.6000	1.300	7.6000
0.150	7.6000	0.480	7.6000	0.900	7.6000	1.310	7.6000
0.200	7.6000	0.500	7.6000	1.000	7.6000	1.320	7.6000
0.250	7.6000	0.600	7.6000	1.100	7.6000	1.350	7.6000
0.300	7.6000	0.650	7.6000	1.150	7.6000	1.400	7.6000
0.350	7.6000	0.700	7.6000	1.200	7.6000	1.500	7.6000

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 7.6l/s	
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 2.sws

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.500
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 3 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.500	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s) Summer and Winter

Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%					
1.001	15 Winter	1	0%					
2.000	15 Winter	1	0%					
1.002	30 Winter	1	0%					
3.000	30 Winter	1	0%					
1.003	30 Winter	1	0%					
1.004	30 Winter	1	0%					
1.005	60 Winter	1	0%					
1.006	60 Winter	1	0%					
1.007	240 Winter	1	0%					
1.008	240 Winter	1	0%					
1.009	240 Winter	1	0%					
1.010	240 Winter	1	0%					
1.011	240 Winter	1	0%					
1.012	240 Winter	1	0%	1/60 Winter				
4.000	15 Winter	1	0%					
4.001	240 Winter	1	0%					
1.013	240 Winter	1	0%	1/60 Summer				

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 20.4l/s																																																																																																																																																																																																									
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<u>Online Controls for 13-022 SW-Net Outfall 2.sws</u> <u>Hydro-Brake® Manhole: S16, DS/PN: 1.003, Volume (m³): 9.5</u> Design Head (m) 1.300 Hydro-Brake® Type Md7 Invert Level (m) 9.289 Design Flow (l/s) 50.0 Diameter (mm) 254 <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>5.9</td><td>1.200</td><td>47.7</td><td>3.000</td><td>75.4</td><td>7.000</td><td>115.2</td></tr><tr><td>0.200</td><td>18.0</td><td>1.400</td><td>51.5</td><td>3.500</td><td>81.5</td><td>7.500</td><td>119.2</td></tr><tr><td>0.300</td><td>28.2</td><td>1.600</td><td>55.1</td><td>4.000</td><td>87.1</td><td>8.000</td><td>123.2</td></tr><tr><td>0.400</td><td>29.7</td><td>1.800</td><td>58.4</td><td>4.500</td><td>92.4</td><td>8.500</td><td>126.9</td></tr><tr><td>0.500</td><td>30.8</td><td>2.000</td><td>61.6</td><td>5.000</td><td>97.4</td><td>9.000</td><td>130.6</td></tr><tr><td>0.600</td><td>33.7</td><td>2.200</td><td>64.6</td><td>5.500</td><td>102.1</td><td>9.500</td><td>134.2</td></tr><tr><td>0.800</td><td>38.9</td><td>2.400</td><td>67.5</td><td>6.000</td><td>106.7</td><td></td><td></td></tr><tr><td>1.000</td><td>43.5</td><td>2.600</td><td>70.2</td><td>6.500</td><td>111.0</td><td></td><td></td></tr></table> <u>Hydro-Brake® Manhole: S19, DS/PN: 1.006, Volume (m³): 4.5</u> Design Head (m) 1.200 Hydro-Brake® Type Md7 Invert Level (m) 9.013 Design Flow (l/s) 85.0 Diameter (mm) 339 <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>7.2</td><td>1.200</td><td>85.0</td><td>3.000</td><td>134.3</td><td>7.000</td><td>205.2</td></tr><tr><td>0.200</td><td>24.1</td><td>1.400</td><td>91.8</td><td>3.500</td><td>145.1</td><td>7.500</td><td>212.4</td></tr><tr><td>0.300</td><td>43.2</td><td>1.600</td><td>98.1</td><td>4.000</td><td>155.1</td><td>8.000</td><td>219.4</td></tr><tr><td>0.400</td><td>58.0</td><td>1.800</td><td>104.1</td><td>4.500</td><td>164.5</td><td>8.500</td><td>226.1</td></tr><tr><td>0.500</td><td>62.6</td><td>2.000</td><td>109.7</td><td>5.000</td><td>173.4</td><td>9.000</td><td>232.7</td></tr><tr><td>0.600</td><td>60.6</td><td>2.200</td><td>115.0</td><td>5.500</td><td>181.9</td><td>9.500</td><td>239.1</td></tr><tr><td>0.800</td><td>69.4</td><td>2.400</td><td>120.2</td><td>6.000</td><td>190.0</td><td></td><td></td></tr><tr><td>1.000</td><td>77.6</td><td>2.600</td><td>125.1</td><td>6.500</td><td>197.7</td><td></td><td></td></tr></table> <u>Depth/Flow Relationship Manhole: S27, DS/PN: 1.014, Volume (m³): 19.4</u> Invert Level (m) 8.429 <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>7.6000</td><td>0.400</td><td>7.6000</td><td>0.800</td><td>20.4000</td><td>1.300</td><td>20.4000</td></tr><tr><td>0.150</td><td>7.6000</td><td>0.490</td><td>7.6000</td><td>0.900</td><td>20.4000</td><td>1.310</td><td>20.4000</td></tr><tr><td>0.200</td><td>7.6000</td><td>0.500</td><td>20.4000</td><td>1.000</td><td>20.4000</td><td>1.320</td><td>20.4000</td></tr><tr><td>0.250</td><td>7.6000</td><td>0.600</td><td>20.4000</td><td>1.100</td><td>20.4000</td><td>1.350</td><td>20.4000</td></tr><tr><td>0.300</td><td>7.6000</td><td>0.650</td><td>20.4000</td><td>1.150</td><td>20.4000</td><td>1.400</td><td>20.4000</td></tr><tr><td>0.350</td><td>7.6000</td><td>0.700</td><td>20.4000</td><td>1.200</td><td>20.4000</td><td>1.500</td><td>20.4000</td></tr></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.9	1.200	47.7	3.000	75.4	7.000	115.2	0.200	18.0	1.400	51.5	3.500	81.5	7.500	119.2	0.300	28.2	1.600	55.1	4.000	87.1	8.000	123.2	0.400	29.7	1.800	58.4	4.500	92.4	8.500	126.9	0.500	30.8	2.000	61.6	5.000	97.4	9.000	130.6	0.600	33.7	2.200	64.6	5.500	102.1	9.500	134.2	0.800	38.9	2.400	67.5	6.000	106.7			1.000	43.5	2.600	70.2	6.500	111.0			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.2	1.200	85.0	3.000	134.3	7.000	205.2	0.200	24.1	1.400	91.8	3.500	145.1	7.500	212.4	0.300	43.2	1.600	98.1	4.000	155.1	8.000	219.4	0.400	58.0	1.800	104.1	4.500	164.5	8.500	226.1	0.500	62.6	2.000	109.7	5.000	173.4	9.000	232.7	0.600	60.6	2.200	115.0	5.500	181.9	9.500	239.1	0.800	69.4	2.400	120.2	6.000	190.0			1.000	77.6	2.600	125.1	6.500	197.7			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.6000	0.400	7.6000	0.800	20.4000	1.300	20.4000	0.150	7.6000	0.490	7.6000	0.900	20.4000	1.310	20.4000	0.200	7.6000	0.500	20.4000	1.000	20.4000	1.320	20.4000	0.250	7.6000	0.600	20.4000	1.100	20.4000	1.350	20.4000	0.300	7.6000	0.650	20.4000	1.150	20.4000	1.400	20.4000	0.350	7.6000	0.700	20.4000	1.200	20.4000	1.500	20.4000
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0.800	69.4	2.400	120.2	6.000	190.0																																																																																																																																																																																																					
1.000	77.6	2.600	125.1	6.500	197.7																																																																																																																																																																																																					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																																																																																																																																																			
0.100	7.6000	0.400	7.6000	0.800	20.4000	1.300	20.4000																																																																																																																																																																																																			
0.150	7.6000	0.490	7.6000	0.900	20.4000	1.310	20.4000																																																																																																																																																																																																			
0.200	7.6000	0.500	20.4000	1.000	20.4000	1.320	20.4000																																																																																																																																																																																																			
0.250	7.6000	0.600	20.4000	1.100	20.4000	1.350	20.4000																																																																																																																																																																																																			
0.300	7.6000	0.650	20.4000	1.150	20.4000	1.400	20.4000																																																																																																																																																																																																			
0.350	7.6000	0.700	20.4000	1.200	20.4000	1.500	20.4000																																																																																																																																																																																																			
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C & A Consulting Engineers Ltd		Page 2
Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 20.4l/s	
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 2.sws

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.500
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 3 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.500	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%	30/15 Summer				
1.001	15 Winter	30	0%	30/15 Summer				
2.000	30 Winter	30	0%	30/15 Summer				
1.002	30 Winter	30	0%	30/15 Summer				
3.000	30 Winter	30	0%	30/15 Summer				
1.003	30 Winter	30	0%	30/15 Summer				
1.004	120 Winter	30	0%	30/30 Summer				
1.005	60 Winter	30	0%	30/15 Winter				
1.006	60 Winter	30	0%	30/15 Summer				
1.007	60 Winter	30	0%	30/60 Summer				
1.008	120 Winter	30	0%	30/30 Winter				
1.009	120 Winter	30	0%	30/60 Summer				
1.010	120 Winter	30	0%	30/30 Winter				
1.011	120 Winter	30	0%	30/30 Winter				
1.012	120 Winter	30	0%	30/15 Summer				
4.000	120 Winter	30	0%	30/60 Winter				
4.001	120 Winter	30	0%	30/30 Winter				
1.013	120 Winter	30	0%	30/15 Summer				

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Adama Consulting Ltd		Page 2							
Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s								
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by								
XP Solutions									
Network 2013.1.1									
Existing Network Details for 13-022 SW-Net Outfall 2.sws									
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	
4.000	26.169	0.154	169.9	0.054	4.00	0.600	o	225	
4.001	27.835	0.165	168.7	0.060	0.00	0.600	o	300	
1.013	62.491	0.155	403.2	0.071	0.00	0.600	o	450	
* 5.000	41.694	0.103	404.8	0.063	4.00	0.600	o	450	
5.001	42.462	0.106	400.6	0.083	0.00	0.600	o	450	
* 6.000	42.211	0.136	310.4	0.000	4.00	0.600	o	375	
* 7.000	13.470	0.033	408.2	0.000	4.00	0.600	\	-1	
* 7.001	6.836	0.569	12.0	0.000	0.00	0.600	o	375	
* 5.002	33.333	0.083	401.6	0.126	0.00	0.600	o	450	
8.000	11.910	0.024	496.3	0.021	4.00	0.600	\	-1	
8.001	13.524	0.972	13.9	0.000	0.00	0.600	o	375	
1.014	20.045	0.083	241.5	0.077	0.00	0.600	o	450	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
4.000	S31	10.219	9.128	0.866	10.482	8.974	1.283		1240 x 675
4.001	S32	10.482	8.899	1.283	10.657	8.734	1.623		1200
1.013	S26	10.657	8.584	1.623	10.247	8.429	1.368		1500
* 5.000	S33	10.000	8.751	0.799	10.258	8.648	1.160		1500
5.001	S34	10.258	8.648	1.160	10.000	8.542	1.008		1500
* 6.000	S36	10.000	8.723	0.902	10.000	8.587	1.038		1050
* 7.000	S37	10.000	9.189	0.311	10.000	9.156	0.344		0
* 7.001	S38	10.000	9.156	0.469	10.000	8.587	1.038		0
* 5.002	S35	10.000	8.512	1.038	10.247	8.429	1.368		1500
8.000	S39	10.000	9.500	0.000	10.000	9.476	0.024		0
8.001	S40	10.000	9.476	0.149	10.247	8.504	1.368		0
1.014	S27	10.247	8.429	1.368	10.160	8.346	1.364	Depth/Flow Relationship	1500
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Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s	
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Surcharged Outfall Details for 13-022 SW-Net Outfall 2.sws

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1265	0.914	1295	0.914	1325	0.914	1355	0.914	1385	0.914	1415	0.914		
1270	0.914	1300	0.914	1330	0.914	1360	0.914	1390	0.914	1420	0.914		
1275	0.914	1305	0.914	1335	0.914	1365	0.914	1395	0.914	1425	0.914		
1280	0.914	1310	0.914	1340	0.914	1370	0.914	1400	0.914	1430	0.914		
1285	0.914	1315	0.914	1345	0.914	1375	0.914	1405	0.914	1435	0.914		
1290	0.914	1320	0.914	1350	0.914	1380	0.914	1410	0.914	1440	0.914		

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Unit 38d The Enterprise Centre

Cranborne Rd Potters Bar

Herts EN6 3DQ

Date 13-Mar-14

File 13-022 SW Network 2.mdx

XP Solutions

Land at Southleigh Farm

Horndean Road - Greenfield RO

Network 2 - Max Q 28.7l/s

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Network 2013.1.1

Online Controls for 13-022 SW-Net Outfall 2.sws

Hydro-Brake® Manhole: S16, DS/PN: 1.003, Volume (m³): 9.5

Design Head (m) 1.300

Hydro-Brake® Type Md7

Invert Level (m) 9.289

Design Flow (l/s) 50.0

Diameter (mm) 254

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	1.200	47.7	3.000	75.4	7.000	115.2
0.200	18.0	1.400	51.5	3.500	81.5	7.500	119.2
0.300	28.2	1.600	55.1	4.000	87.1	8.000	123.2
0.400	29.7	1.800	58.4	4.500	92.4	8.500	126.9
0.500	30.8	2.000	61.6	5.000	97.4	9.000	130.6
0.600	33.7	2.200	64.6	5.500	102.1	9.500	134.2
0.800	38.9	2.400	67.5	6.000	106.7		
1.000	43.5	2.600	70.2	6.500	111.0		

Hydro-Brake® Manhole: S19, DS/PN: 1.006, Volume (m³): 4.5

Design Head (m) 1.200

Hydro-Brake® Type Md7

Invert Level (m) 9.013

Design Flow (l/s) 85.0

Diameter (mm) 339

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	85.0	3.000	134.3	7.000	205.2
0.200	24.1	1.400	91.8	3.500	145.1	7.500	212.4
0.300	43.2	1.600	98.1	4.000	155.1	8.000	219.4
0.400	58.0	1.800	104.1	4.500	164.5	8.500	226.1
0.500	62.6	2.000	109.7	5.000	173.4	9.000	232.7
0.600	60.6	2.200	115.0	5.500	181.9	9.500	239.1
0.800	69.4	2.400	120.2	6.000	190.0		
1.000	77.6	2.600	125.1	6.500	197.7		

Depth/Flow Relationship Manhole: S27, DS/PN: 1.014, Volume (m³): 19.4

Invert Level (m) 8.429

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6000	0.490	7.6000	0.990	28.7000	1.350	28.7000
0.150	7.6000	0.500	20.4000	1.000	28.7000	1.400	28.7000
0.200	7.6000	0.600	20.4000	1.150	28.7000	1.500	28.7000
0.250	7.6000	0.650	20.4000	1.200	28.7000	1.600	28.7000
0.300	7.6000	0.700	20.4000	1.300	28.7000	1.700	28.7000
0.350	7.6000	0.800	28.7000	1.310	28.7000		
0.400	7.6000	0.988	28.7000	1.320	28.7000		

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Unit 38d The Enterprise Centre
Cranborne Rd Potters Bar
Herts EN6 3DQ

Date 13-Mar-14
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XP Solutions

Land at Southleigh Farm
Horndean Road - Greenfield RO
Network 2 - Max Q 28.7l/s

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Storage Structures for 13-022 SW-Net Outfall 2.sws

Tank or Pond Manhole: S29, DS/PN: 2.000

Invert Level (m) 10.919

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	30.9	0.200	50.6	0.400	74.3
0.100	40.2	0.300	61.9	0.500	87.7

Porous Car Park Manhole: S30, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	22.2
Membrane Percolation (mm/hr)	4500	Length (m)	31.1
Max Percolation (l/s)	863.0	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.314	Cap Volume Depth (m)	0.000

Complex Manhole: S16, DS/PN: 1.003

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	4500	Length (m)	24.0
Max Percolation (l/s)	180.0	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.026	Cap Volume Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.3
Membrane Percolation (mm/hr)	4500	Length (m)	15.0
Max Percolation (l/s)	249.4	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.140	Cap Volume Depth (m)	0.000

Complex Manhole: S18, DS/PN: 1.005

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Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s																																																							
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by																																																							
XP Solutions	Network 2013.1.1																																																							
Tank or Pond Invert Level (m) 9.987 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>65.9</td><td>0.200</td><td>90.9</td><td>0.400</td><td>118.2</td></tr><tr><td>0.100</td><td>78.2</td><td>0.300</td><td>104.2</td><td>0.500</td><td>132.6</td></tr></tbody></table> Porous Car Park Infiltration Coefficient Base (m/hr) 0.00000 Membrane Percolation (mm/hr) 4500 Max Percolation (l/s) 158.1 Safety Factor 2.0 Porosity 0.30 Invert Level (m) 9.827 Width (m) 6.2 Length (m) 20.4 Slope (1:X) 150.0 Depression Storage (mm) 5 Evaporation (mm/day) 3 Cap Volume Depth (m) 0.000 Complex Manhole: S19, DS/PN: 1.006 Tank or Pond Invert Level (m) 9.906 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>76.2</td><td>0.200</td><td>100.9</td><td>0.400</td><td>128.3</td></tr><tr><td>0.100</td><td>88.2</td><td>0.300</td><td>114.2</td><td></td><td></td></tr></tbody></table> Tank or Pond Invert Level (m) 9.906 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>95.6</td><td>0.200</td><td>141.4</td><td>0.400</td><td>191.2</td></tr><tr><td>0.100</td><td>118.0</td><td>0.300</td><td>165.8</td><td></td><td></td></tr></tbody></table> Complex Manhole: S33, DS/PN: 5.000 Porous Car Park Infiltration Coefficient Base (m/hr) 0.00000 Membrane Percolation (mm/hr) 4500 Max Percolation (l/s) 279.5 Safety Factor 2.0 Porosity 0.30 Invert Level (m) 9.270 Width (m) 4.0 Length (m) 55.9			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	65.9	0.200	90.9	0.400	118.2	0.100	78.2	0.300	104.2	0.500	132.6	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	76.2	0.200	100.9	0.400	128.3	0.100	88.2	0.300	114.2			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	95.6	0.200	141.4	0.400	191.2	0.100	118.0	0.300	165.8		
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																			
0.000	65.9	0.200	90.9	0.400	118.2																																																			
0.100	78.2	0.300	104.2	0.500	132.6																																																			
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																			
0.000	76.2	0.200	100.9	0.400	128.3																																																			
0.100	88.2	0.300	114.2																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																			
0.000	95.6	0.200	141.4	0.400	191.2																																																			
0.100	118.0	0.300	165.8																																																					

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Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s	
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by	
XP Solutions Network 2013.1.1		

Porous Car Park

Slope (1:X) 200.0 Evaporation (mm/day) 3
Depression Storage (mm) 5 Cap Volume Depth (m) 0.000

Tank or Pond

Invert Level (m) 9.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	29.9	0.200	48.7	0.400	71.6
0.100	38.8	0.300	59.6	0.500	84.5

Cellular Storage Manhole: S36, DS/PN: 6.000

Invert Level (m) 8.950 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.96
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	141.4	141.4	0.800	0.0	175.0
0.700	141.4	175.0			

Complex Manhole: S35, DS/PN: 5.002

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 17.0
Membrane Percolation (mm/hr) 4500 Length (m) 17.1
Max Percolation (l/s) 363.4 Slope (1:X) 200.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 9.000 Cap Volume Depth (m) 0.000

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 11.3
Membrane Percolation (mm/hr) 4500 Length (m) 26.6
Max Percolation (l/s) 375.7 Slope (1:X) 200.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 9.000 Cap Volume Depth (m) 0.000

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Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s																									
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by																									
XP Solutions	Network 2013.1.1																									
<u>Porous Car Park Manhole: S39, DS/PN: 8.000</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>13.3</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>15.9</td></tr><tr><td>Max Percolation (l/s)</td><td>264.3</td><td>Slope (1:X)</td><td>150.0</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>9.500</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.3	Membrane Percolation (mm/hr)	4500	Length (m)	15.9	Max Percolation (l/s)	264.3	Slope (1:X)	150.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	9.500	Cap Volume Depth (m)	0.000
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.3																							
Membrane Percolation (mm/hr)	4500	Length (m)	15.9																							
Max Percolation (l/s)	264.3	Slope (1:X)	150.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	9.500	Cap Volume Depth (m)	0.000																							
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Unit 38d The Enterprise Centre Cranborne Rd Potters Bar Herts EN6 3DQ	Land at Southleigh Farm Horndean Road - Greenfield RO Network 2 - Max Q 28.7l/s							
Date 13-Mar-14 File 13-022 SW Network 2.mdx	Designed by TL Checked by							
XP Solutions	Network 2013.1.1							
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 2.sws</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 5.500						
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 3 Number of Storage Structures 9 Number of Real Time Controls 0								
<u>Synthetic Rainfall Details</u>								
Rainfall Model		FSR	Ratio R 0.347					
Region England and Wales		Cv (Summer)	0.750					
M5-60 (mm)		19.500 Cv (Winter)	0.840					
Margin for Flood Risk Warning (mm)		300.0						
Analysis Timestep 2.5 Second Increment (Extended)								
DTS Status		ON						
DVD Status		ON						
Inertia Status		ON						
Profile(s)		Summer and Winter						
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440								
Return Period(s) (years)		100						
Climate Change (%)		30						
PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+30%	100/15 Summer				
1.001	15 Winter	100	+30%	100/15 Summer				
2.000	15 Winter	100	+30%	100/15 Summer				
1.002	60 Winter	100	+30%	100/15 Summer				
3.000	60 Winter	100	+30%	100/15 Summer				
1.003	30 Winter	100	+30%	100/15 Summer				
1.004	240 Winter	100	+30%	100/15 Summer				
1.005	240 Winter	100	+30%	100/15 Summer				
1.006	240 Winter	100	+30%	100/15 Summer				
1.007	480 Winter	100	+30%	100/15 Summer				
1.008	480 Winter	100	+30%	100/15 Summer				
1.009	480 Winter	100	+30%	100/15 Summer				
1.010	480 Winter	100	+30%	100/15 Summer				
1.011	480 Winter	100	+30%	100/15 Summer				
1.012	480 Winter	100	+30%	100/15 Summer				
4.000	480 Winter	100	+30%	100/15 Summer				
4.001	480 Winter	100	+30%	100/15 Summer				
1.013	480 Winter	100	+30%	100/15 Summer				
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 2.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
5.000	480 Winter	100	+30%	100/15 Summer				
5.001	480 Winter	100	+30%	100/15 Summer				
6.000	480 Winter	100	+30%	100/15 Summer				
7.000	480 Winter	100	+30%	100/60 Winter				
7.001	480 Winter	100	+30%	100/60 Summer				
5.002	480 Winter	100	+30%	100/15 Summer				
8.000	480 Winter	100	+30%					
8.001	480 Winter	100	+30%	100/240 Summer				
1.014	480 Winter	100	+30%	100/15 Summer				

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow	Pipe	Status
		Level (m)		Volume (m³)		(l/s)	Flow (l/s)	
1.000	S13	10.966	0.736	0.000	0.60	0.0	21.7	SURCHARGED
1.001	S14	10.905	0.795	0.000	1.40	0.0	52.1	SURCHARGED
2.000	S29	10.713	0.622	0.000	1.10	0.0	40.8	SURCHARGED
1.002	S15	10.660	0.730	0.000	0.57	0.0	67.1	SURCHARGED
3.000	S30	10.549	0.680	0.000	0.31	0.0	20.3	SURCHARGED
1.003	S16	10.559	0.820	0.000	0.22	0.0	36.1	FLOOD RISK
1.004	S17	10.149	0.545	0.000	0.23	0.0	32.9	SURCHARGED
1.005	S18	10.139	0.638	0.000	0.35	0.0	37.6	SURCHARGED
1.006	S19	10.132	0.744	0.000	0.50	0.0	42.1	FLOOD RISK
1.007	S20	9.997	0.649	0.000	0.04	0.0	29.0	SURCHARGED*
1.008	S21	9.997	0.671	0.000	0.04	0.0	28.9	SURCHARGED*
1.009	S22	9.996	0.698	0.000	0.03	0.0	30.1	SURCHARGED*
1.010	S23	9.996	0.739	0.000	0.03	0.0	31.1	SURCHARGED*
1.011	S24	9.995	0.780	0.000	0.06	0.0	32.2	SURCHARGED*
1.012	S25	9.995	0.925	0.000	0.30	0.0	32.1	SURCHARGED*
4.000	S31	9.994	0.641	0.000	0.09	0.0	3.3	FLOOD RISK
4.001	S32	9.994	0.795	0.000	0.09	0.0	7.0	SURCHARGED
1.013	S26	9.990	0.956	0.000	0.29	0.0	42.6	SURCHARGED
5.000	S33	9.981	0.780	0.000	0.03	0.0	5.0	FLOOD RISK
5.001	S34	9.981	0.883	0.000	0.04	0.0	6.1	FLOOD RISK
6.000	S36	9.980	0.882	0.000	0.02	0.0	2.2	FLOOD RISK
7.000	S37	9.980	0.291	0.000	0.00	0.0	0.0	FLOOD RISK*
7.001	S38	9.980	0.449	0.000	0.00	0.0	1.0	FLOOD RISK*
5.002	S35	9.980	1.018	0.000	0.09	0.0	12.7	FLOOD RISK
8.000	S39	9.979	-0.021	0.000	0.00	0.0	3.4	FLOOD RISK*
8.001	S40	9.979	0.128	0.000	0.01	0.0	4.1	FLOOD RISK*
1.014	S27	9.980	1.101	0.000	0.13	0.0	21.9	FLOOD RISK

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU			Land at Southleigh Farm Horndean Road, Emsworth Network 3 - Max Q 2.6l/s																																																																																																																																																												
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Existing Network Details for 13-022 SW-Net Outfall 3.sws																																																																																																																																																															
* - Indicates pipe has been modified outside of System 1																																																																																																																																																															
<table><thead><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th></th></tr></thead><tbody><tr><td>1.000</td><td>18.017</td><td>0.036</td><td>500.5</td><td>0.032</td><td>4.00</td><td>0.600</td><td>√</td><td>-1</td><td></td></tr><tr><td>1.001</td><td>12.980</td><td>0.026</td><td>499.2</td><td>0.000</td><td>0.00</td><td>0.600</td><td>√</td><td>-1</td><td></td></tr><tr><td>1.002</td><td>14.473</td><td>0.029</td><td>499.1</td><td>0.020</td><td>0.00</td><td>0.600</td><td>√</td><td>-1</td><td></td></tr><tr><td>1.003</td><td>8.590</td><td>0.017</td><td>505.3</td><td>0.000</td><td>0.00</td><td>0.600</td><td>√</td><td>-1</td><td></td></tr><tr><td>1.004</td><td>15.764</td><td>0.402</td><td>39.2</td><td>0.019</td><td>0.00</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>* 1.005</td><td>31.572</td><td>0.130</td><td>242.9</td><td>0.117</td><td>0.00</td><td>0.600</td><td>oo</td><td>41</td><td></td></tr><tr><td colspan="10"></td></tr><tr><td>* 2.000</td><td>28.864</td><td>0.093</td><td>310.4</td><td>0.070</td><td>4.00</td><td>0.600</td><td>o</td><td>375</td><td></td></tr><tr><td>2.001</td><td>27.520</td><td>0.088</td><td>312.7</td><td>0.100</td><td>0.00</td><td>0.600</td><td>oo</td><td>42</td><td></td></tr><tr><td colspan="10"></td></tr><tr><td>3.000</td><td>13.968</td><td>0.045</td><td>310.4</td><td>0.034</td><td>4.00</td><td>0.600</td><td>o</td><td>375</td><td></td></tr><tr><td colspan="10"></td></tr><tr><td>1.006</td><td>9.546</td><td>0.031</td><td>307.9</td><td>0.037</td><td>0.00</td><td>0.600</td><td>oo</td><td>42</td><td></td></tr><tr><td>1.007</td><td>32.978</td><td>0.136</td><td>242.5</td><td>0.022</td><td>0.00</td><td>0.600</td><td>o</td><td>300</td><td></td></tr></tbody></table>										PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)		1.000	18.017	0.036	500.5	0.032	4.00	0.600	√	-1		1.001	12.980	0.026	499.2	0.000	0.00	0.600	√	-1		1.002	14.473	0.029	499.1	0.020	0.00	0.600	√	-1		1.003	8.590	0.017	505.3	0.000	0.00	0.600	√	-1		1.004	15.764	0.402	39.2	0.019	0.00	0.600	o	300		* 1.005	31.572	0.130	242.9	0.117	0.00	0.600	oo	41												* 2.000	28.864	0.093	310.4	0.070	4.00	0.600	o	375		2.001	27.520	0.088	312.7	0.100	0.00	0.600	oo	42												3.000	13.968	0.045	310.4	0.034	4.00	0.600	o	375												1.006	9.546	0.031	307.9	0.037	0.00	0.600	oo	42		1.007	32.978	0.136	242.5	0.022	0.00	0.600	o	300	
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1.007	32.978	0.136	242.5	0.022	0.00	0.600	o	300																																																																																																																																																							
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)																																																																																																																																																						
1.000	S41	10.174	9.072	0.602	10.047	9.036	0.511		0																																																																																																																																																						
1.001	S42	10.047	9.036	0.511	9.980	9.010	0.470		0																																																																																																																																																						
1.002	S43	9.980	9.010	0.470	9.895	8.981	0.414		0																																																																																																																																																						
1.003	S44	9.895	8.981	0.414	9.843	8.964	0.379		0																																																																																																																																																						
1.004	S45	9.843	8.964	0.579	9.712	8.562	0.850		0																																																																																																																																																						
* 1.005	S46	9.712	8.562	0.850	9.536	8.432	0.804		1350 x 1350																																																																																																																																																						
* 2.000	S50	9.912	8.538	0.999	9.719	8.445	0.899		1500																																																																																																																																																						
2.001	S51	9.719	8.445	0.899	9.536	8.357	0.804		1425 x 1425																																																																																																																																																						
3.000	S52	9.530	8.402	0.753	9.536	8.357	0.804		1500																																																																																																																																																						
1.006	S47	9.536	8.357	0.804	9.530	8.326	0.829		1425 x 1425																																																																																																																																																						
1.007	S48	9.530	8.326	0.904	9.530	8.190	1.040	Depth/Flow Relationship	1425 x 1800																																																																																																																																																						

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Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Online Controls for 13-022 SW-Net Outfall 3.sws

Depth/Flow Relationship Manhole: S48, DS/PN: 1.007, Volume (m³): 4.9

Invert Level (m) 8.326

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6000	0.350	2.6000	0.700	2.6000	1.100	2.6000
0.150	2.6000	0.400	2.6000	0.790	2.6000	1.200	2.6000
0.200	2.6000	0.440	2.6000	0.800	2.6000	1.300	2.6000
0.250	2.6000	0.500	2.6000	0.900	2.6000	1.500	2.6000
0.300	2.6000	0.600	2.6000	1.000	2.6000	1.600	2.6000

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Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 3.sws

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
		Level (m)		Volume (m³)			Flow (l/s)	
1.002	S43	9.040	-0.470	0.000	0.01	0.0	6.2	OK
1.003	S44	9.017	-0.464	0.000	0.01	0.0	6.2	OK
1.004	S45	9.011	-0.253	0.000	0.01	0.0	2.1	OK*
1.005	S46	9.010	0.148	0.000	0.04	0.0	4.6	SURCHARGED
2.000	S50	9.010	0.097	0.000	0.02	0.0	1.6	SURCHARGED
2.001	S51	9.010	0.190	0.000	0.02	0.0	3.8	SURCHARGED
3.000	S52	9.010	0.233	0.000	0.02	0.0	1.4	SURCHARGED
1.006	S47	9.010	0.278	0.000	0.02	0.0	3.3	SURCHARGED
1.007	S48	9.011	0.385	0.000	0.04	0.0	2.6	SURCHARGED

C & A Consulting Engineers Ltd		Page 1
Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road, Emsworth Network 3 - Max Q 6.8l/s	
Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Online Controls for 13-022 SW-Net Outfall 3.sws

Depth/Flow Relationship Manhole: S48, DS/PN: 1.007, Volume (m³): 4.9

Invert Level (m) 8.326

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6000	0.350	2.6000	0.700	6.8000	1.100	6.8000
0.150	2.6000	0.360	2.6000	0.790	6.8000	1.200	6.8000
0.200	2.6000	0.400	6.8000	0.800	6.8000	1.300	6.8000
0.250	2.6000	0.500	6.8000	0.900	6.8000	1.500	6.8000
0.300	2.6000	0.600	6.8000	1.000	6.8000	1.600	6.8000

Simulation Criteria

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	5	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.346
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.600	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
(s) (years)	30
Change (%)	0

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
		Level (m)		Volume (m³)			Flow (l/s)	
1.000	S41	9.217	-0.355	0.000	0.00	0.0	3.4	OK
1.001	S42	9.217	-0.319	0.000	0.00	0.0	3.1	OK

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road, Emsworth Network 3 - Max Q 6.8l/s	
Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 3.sws

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
		Level (m)		Volume (m³)			Flow (l/s)	
1.002	S43	9.217	-0.293	0.000	0.01	0.0	4.9	OK
1.003	S44	9.217	-0.264	0.000	0.00	0.0	4.4	OK
1.004	S45	9.217	-0.047	0.000	0.04	0.0	6.0	OK*
1.005	S46	9.217	0.355	0.000	0.12	0.0	15.8	SURCHARGED
2.000	S50	9.216	0.303	0.000	0.07	0.0	7.0	SURCHARGED
2.001	S51	9.216	0.396	0.000	0.08	0.0	15.9	SURCHARGED
3.000	S52	9.215	0.438	0.000	0.02	0.0	2.1	SURCHARGED
1.006	S47	9.214	0.482	0.000	0.05	0.0	7.8	SURCHARGED
1.007	S48	9.209	0.583	0.000	0.10	0.0	6.8	SURCHARGED

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Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road, Emsworth Network 3 - Max Q 9.6l/s	
Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Online Controls for 13-022 SW-Net Outfall 3.sws

Depth/Flow Relationship Manhole: S48, DS/PN: 1.007, Volume (m³): 4.9

Invert Level (m) 8.326

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6000	0.350	2.6000	0.700	6.8000	1.100	9.6000
0.150	2.6000	0.360	2.6000	0.730	9.6000	1.200	9.6000
0.200	2.6000	0.400	6.8000	0.750	9.6000	1.300	9.6000
0.250	2.6000	0.500	6.8000	0.800	9.6000	1.500	9.6000
0.300	2.6000	0.600	6.8000	1.000	9.6000	1.600	9.6000

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Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by																																																																																																																									
XP Solutions	Network 2013.1.1																																																																																																																									
<u>Storage Structures for 13-022 SW-Net Outfall 3.sws</u> <u>Porous Car Park Manhole: S46, DS/PN: 1.005</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>11.8</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>28.3</td></tr><tr><td>Max Percolation (l/s)</td><td>417.4</td><td>Slope (1:X)</td><td>200.0</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>9.027</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table> <u>Porous Car Park Manhole: S50, DS/PN: 2.000</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>5.9</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>47.6</td></tr><tr><td>Max Percolation (l/s)</td><td>351.1</td><td>Slope (1:X)</td><td>150.0</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>9.227</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table> <u>Porous Car Park Manhole: S51, DS/PN: 2.001</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>8.2</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>22.5</td></tr><tr><td>Max Percolation (l/s)</td><td>230.6</td><td>Slope (1:X)</td><td>150.0</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>9.034</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table> <u>Porous Car Park Manhole: S52, DS/PN: 3.000</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>13.3</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>15.0</td></tr><tr><td>Max Percolation (l/s)</td><td>249.4</td><td>Slope (1:X)</td><td>200.0</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>8.845</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table> <u>Porous Car Park Manhole: S47, DS/PN: 1.006</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>11.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>4500</td><td>Length (m)</td><td>18.5</td></tr><tr><td>Max Percolation (l/s)</td><td>254.4</td><td>Slope (1:X)</td><td>150.0</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>8.851</td><td>Cap Volume Depth (m)</td><td>0.000</td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.8	Membrane Percolation (mm/hr)	4500	Length (m)	28.3	Max Percolation (l/s)	417.4	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	9.027	Cap Volume Depth (m)	0.000	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.9	Membrane Percolation (mm/hr)	4500	Length (m)	47.6	Max Percolation (l/s)	351.1	Slope (1:X)	150.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	9.227	Cap Volume Depth (m)	0.000	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.2	Membrane Percolation (mm/hr)	4500	Length (m)	22.5	Max Percolation (l/s)	230.6	Slope (1:X)	150.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	9.034	Cap Volume Depth (m)	0.000	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.3	Membrane Percolation (mm/hr)	4500	Length (m)	15.0	Max Percolation (l/s)	249.4	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.845	Cap Volume Depth (m)	0.000	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.0	Membrane Percolation (mm/hr)	4500	Length (m)	18.5	Max Percolation (l/s)	254.4	Slope (1:X)	150.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.851	Cap Volume Depth (m)	0.000
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C & A Consulting Ltd		Page 6
Office 19, Hart House Priestley Rd Basingstoke Hants RG24 9PU	Land at Southleigh Farm Horndean Road, Emsworth Network 3 - Max Q 9.6l/s	
Date 13-Mar-14 File 13-022 SW Network 3.mdx	Designed by TL Checked by	
XP Solutions	Network 2013.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for 13-022 SW-Net Outfall 3.sws

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
		Level (m)		Volume (m³)			Flow (l/s)	
1.002	S43	9.532	0.022	0.000	0.00	0.0	1.5	SURCHARGED*
1.003	S44	9.532	0.051	0.000	0.00	0.0	2.2	SURCHARGED*
1.004	S45	9.532	0.268	0.000	0.02	0.0	2.7	SURCHARGED*
1.005	S46	9.531	0.669	0.000	0.04	0.0	5.0	FLOOD RISK
2.000	S50	9.531	0.618	0.000	0.02	0.0	2.0	SURCHARGED
2.001	S51	9.530	0.710	0.000	0.02	0.0	3.5	FLOOD RISK
3.000	S52	9.530	0.753	0.000	0.04	0.0	3.4	FLOOD RISK
1.006	S47	9.530	0.798	0.000	0.07	0.0	11.2	FLOOD RISK
1.007	S48	9.530	0.904	0.000	0.10	0.0	6.8	FLOOD RISK