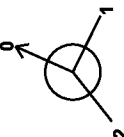
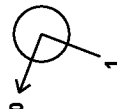
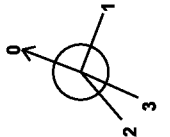
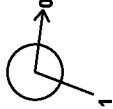


Eireng Consulting Engineers		File: 212039_Storm Calculations.pfd Network: Outfall 1 Jakub Matveev 01/05/2021				Page 2 Oldlands Farm Bognor					
Links											
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S001	S002	24.538	0.600	1.905	1.780	0.125	196.3	225	5.44	50.0
1.001	S002	S003	61.620	0.600	1.705	1.460	0.245	251.5	300	6.48	50.0
1.002	S003	S004	61.620	0.600	1.460	1.215	0.245	251.5	300	7.52	49.5
1.003	S004	S013	39.416	0.600	1.215	1.055	0.160	246.3	300	8.18	47.4
Qmax link	ACO Qmax 350 (equivalent manhole diameter)	S005	24.973	0.600	1.640	1.630	0.010	2497.3	300	6.36	50.0
2.000	S005	S007	27.661	0.600	1.630	1.520	0.110	251.5	300	6.83	50.0
3.000	S006	S007	27.855	0.600	1.735	1.595	0.140	199.0	225	5.50	50.0
2.001	S007	S009	63.026	0.600	1.445	1.265	0.180	350.1	375	7.92	48.2
4.000	S008	S009	81.810	0.600	1.425	1.190	0.235	348.1	450	6.26	50.0
2.002	S009	S010	58.962	0.600	1.115	0.965	0.150	393.1	525	8.80	45.7
2.003	S010	S013	54.235	0.600	0.965	0.830	0.135	401.7	525	9.61	43.6
5.000	S011	S012	90.000	0.600	1.510	1.210	0.300	300.0	375	6.44	50.0
5.001	S012	S013	80.574	0.600	1.135	0.905	0.230	350.3	450	7.68	49.0
1.004	S013	S014	3.539	0.600	0.755	0.740	0.015	236.0	600	9.65	43.5
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)		
1.000	0.929	37.0	11.5	0.970	0.745	0.085	0.0	86	0.821		
1.001	0.987	69.7	18.6	0.745	1.040	0.137	0.0	105	0.837		
1.002	0.987	69.7	23.9	1.040	1.165	0.178	0.0	121	0.897		
1.003	0.997	70.5	26.0	1.165	0.945	0.202	0.0	126	0.923		
Qmax link	0.305	21.6	21.4	0.240	1.120	0.158	0.0	245	0.347		
2.000	0.987	69.7	21.4	1.120	1.580	0.158	0.0	114	0.871		
3.000	0.923	36.7	12.9	0.840	1.580	0.095	0.0	92	0.843		
2.001	0.962	106.3	33.1	1.580	1.260	0.253	0.0	143	0.853		
4.000	1.084	172.3	82.7	0.895	1.260	0.610	0.0	219	1.072		
2.002	1.123	243.2	122.6	1.260	1.710	0.990	0.0	264	1.126		
2.003	1.111	240.5	131.9	1.710	0.945	1.116	0.0	278	1.136		
5.000	1.041	114.9	42.4	0.865	0.715	0.313	0.0	157	0.964		
5.001	1.080	171.8	67.4	0.715	0.945	0.508	0.0	196	1.017		
1.004	1.581	446.9	215.3	0.945	0.860	1.826	0.0	293	1.566		
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Links												
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	
1.005	S014	S015	20.119	0.600	0.740	0.560	0.180	111.8	600	9.79	43.2	
1.006a	S015	Attenuation Pond	52.467	0.600	0.560	0.450	0.110	477.0	600	10.58	41.4	
1.006b	Attenuation Pond	S016	19.227	0.600	0.450	0.440	0.010	1922.7	675	11.13	40.2	
1.007	S016	S017	7.470	0.600	0.440	0.400	0.040	186.8	450	11.21	40.1	
1.008	S017	Outfall 1	2.061	0.600	0.400	0.360	0.040	51.5	375	11.22	40.0	
Pro												
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)			
1.005	2.302	651.0	213.6	0.860	0.840	1.826	0.0	236	2.073			
1.006a	1.108	313.3	204.8	0.840	0.400	1.826	0.0	354	1.177			
1.006b	0.588	210.5	199.1	0.325	0.485	1.826	0.0	526	0.665			
1.007	1.484	236.0	198.3	0.710	0.650	1.826	0.0	318	1.654			
1.008	2.529	279.3	198.2	0.725	0.765	1.826	0.0	234	2.735			
Pipeline Schedule												
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)		
1.000	24.538	196.3	225	Circular	3.100	1.905	0.970	2.750	1.780	0.745		
1.001	61.620	251.5	300	Circular	2.750	1.705	0.745	2.800	1.460	1.040		
1.002	61.620	251.5	300	Circular	2.800	1.460	1.040	2.680	1.215	1.165		
1.003	39.416	246.3	300	Circular	2.680	1.215	1.165	2.300	1.055	0.945		
Qmax link	24.973	2497.3	300	Circular	2.180	1.640	0.240	3.050	1.630	1.120		
MH												
Link	US Node		Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type <td colspan="2"></td>			
1.000	S001		1200	Manhole	Adoptable	S002	1200	Manhole	Adoptable			
1.001	S002		1200	Manhole	Adoptable	S003	1200	Manhole	Adoptable			
1.002	S003		1200	Manhole	Adoptable	S004	1200	Manhole	Adoptable			
1.003	S004		1200	Manhole	Adoptable	S013	1800	Manhole	Adoptable			
Qmax link	ACO Qmax 350 (equivalent manhole diameter)		Junction			S005	1800	Manhole	Adoptable			
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Pipeline Schedule											
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)	
2.000	27.661	251.5	300	Circular	3.050	1.630	1.120	3.400	1.520	1.580	
3.000	27.855	199.0	225	Circular	2.800	1.735	0.840	3.400	1.595	1.580	
2.001	63.026	350.1	375	Circular	3.400	1.445	1.580	2.900	1.265	1.260	
4.000	81.810	348.1	450	Circular	2.770	1.425	0.895	2.900	1.190	1.260	
2.002	58.962	393.1	525	Circular	2.900	1.115	1.260	3.200	0.965	1.710	
2.003	54.235	401.7	525	Circular	3.200	0.965	1.710	2.300	0.830	0.945	
5.000	90.000	300.0	375	Circular	2.750	1.510	0.865	2.300	1.210	0.715	
5.001	80.574	350.3	450	Circular	2.300	1.135	0.715	2.300	0.905	0.945	
1.004	3.539	236.0	600	Circular	2.300	0.755	0.945	2.200	0.740	0.860	
1.005	20.119	111.8	600	Circular	2.200	0.740	0.860	2.000	0.560	0.840	
1.006a	52.467	477.0	600	Circular	2.000	0.560	0.840	1.450	0.450	0.400	
1.006b	19.227	1922.7	675	Circular	1.450	0.450	0.325	1.600	0.440	0.485	
1.007	7.470	186.8	450	Circular	1.600	0.440	0.710	1.500	0.400	0.650	
1.008	2.061	51.5	375	Circular	1.500	0.400	0.725	1.500	0.360	0.765	
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type			
2.000	S005	1800	Manhole	Adoptable	S007	1200	Manhole	Adoptable			
3.000	S006	1800	Manhole	Adoptable	S007	1200	Manhole	Adoptable			
2.001	S007	1200	Manhole	Adoptable	S009	1800	Manhole	Adoptable			
4.000	S008	1500	Manhole	Adoptable	S009	1800	Manhole	Adoptable			
2.002	S009	1800	Manhole	Adoptable	S010	1800	Manhole	Adoptable			
2.003	S010	1800	Manhole	Adoptable	S013	1800	Manhole	Adoptable			
5.000	S011	1200	Manhole	Adoptable	S012	1500	Manhole	Adoptable			
5.001	S012	1500	Manhole	Adoptable	S013	1800	Manhole	Adoptable			
1.004	S013	1800	Manhole	Adoptable	S014	1800	Manhole	Adoptable			
1.005	S014	1800	Manhole	Adoptable	S015	1800	Manhole	Adoptable			
1.006a	S015	1800	Manhole	Adoptable	Attenuation Pond		Junction				
1.006b	Attenuation Pond		Junction		S016	1800	Manhole	Adoptable			
1.007	S016	1800	Manhole	Adoptable	S017	1200	Manhole	Adoptable			
1.008	S017	1200	Manhole	Adoptable	Outfall 1	1200	Manhole	Adoptable			
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Manhole Schedule										
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S008	494635.987	101836.966	2.770	1.345	1500					
S009	494562.554	101873.027	2.900	1.785	1800	0	4.000	1.425	450	
							1	4.000	1.190	450
						2	2.001	1.265	375	
S010	494586.560	101926.881	3.200	2.235	1800	0	2.002	1.115	525	
							1	2.002	0.965	525
S011	494651.724	101863.602	2.750	1.240	1200		0	2.003	0.965	525
S012	494683.905	101947.652	2.300	1.165	1500	0	5.000	1.510	375	
							1	5.000	1.210	375
S013	494608.641	101976.417	2.300	1.545	1800	0	5.001	1.135	450	
							1	5.001	0.905	450
						2	1.003	1.055	300	
						3	2.003	0.830	525	
S014	494609.905	101979.723	2.200	1.460	1800	0	1.004	0.755	600	
							1	1.004	0.740	600
S015	494629.854	101977.111	2.000	1.440	1800	0	1.005	0.740	600	
							1	1.005	0.560	600
						0	1.006a	0.560	600	

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Manhole Schedule <table><tr><th>Node</th><th>Easting (m)</th><th>Northing (m)</th><th>CL (m)</th><th>Depth (m)</th><th>Dia (mm)</th><th>Connections</th><th>Link</th><th>IL (m)</th><th>Dia (mm)</th></tr><tr><td>Attenuation Pond</td><td>494681.877</td><td>101970.299</td><td>1.450</td><td>1.000</td><td></td><td>1</td><td>1.006a</td><td>0.450</td><td>600</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>S016</td><td>494689.276</td><td>101952.553</td><td>1.600</td><td>1.160</td><td>1800</td><td>0</td><td>1.006b</td><td>0.450</td><td>675</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>1.006b</td><td>0.440</td><td>675</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>S017</td><td>494696.203</td><td>101949.757</td><td>1.500</td><td>1.100</td><td>1200</td><td>0</td><td>1.007</td><td>0.440</td><td>450</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>1.007</td><td>0.400</td><td>450</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Outfall 1</td><td>494698.114</td><td>101948.986</td><td>1.500</td><td>1.140</td><td>1200</td><td>0</td><td>1.008</td><td>0.400</td><td>375</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>1.008</td><td>0.360</td><td>375</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Simulation Settings <table><tr><td colspan="2">Rainfall Methodology</td><td>FSR</td><td colspan="2">Analysis Speed</td><td>Normal</td></tr><tr><td>FSR Region</td><td>England and Wales</td><td></td><td>Skip Steady State</td><td>x</td><td></td></tr><tr><td>M5-60 (mm)</td><td>17.000</td><td></td><td>Drain Down Time (mins)</td><td>240</td><td></td></tr><tr><td>Ratio-R</td><td>0.400</td><td></td><td>Additional Storage (m³/ha)</td><td>20.0</td><td></td></tr><tr><td>Summer CV</td><td>0.750</td><td></td><td>Check Discharge Rate(s)</td><td>✓</td><td></td></tr><tr><td>Winter CV</td><td>0.840</td><td></td><td>1 year (l/s)</td><td>11.5</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>30 year (l/s)</td><td>32.4</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>100 year (l/s)</td><td>43.1</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>Check Discharge Volume</td><td>✓</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>100 year 360 minute (m³)</td><td>885</td></tr></table> Storm Durations <table><tr><td>15</td><td>30</td><td>60</td><td>120</td><td>180</td><td>240</td><td>360</td><td>480</td><td>600</td><td>720</td><td>960</td><td>1440</td></tr></table>										Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	Attenuation Pond	494681.877	101970.299	1.450	1.000		1	1.006a	0.450	600											S016	494689.276	101952.553	1.600	1.160	1800	0	1.006b	0.450	675							1	1.006b	0.440	675											S017	494696.203	101949.757	1.500	1.100	1200	0	1.007	0.440	450							1	1.007	0.400	450											Outfall 1	494698.114	101948.986	1.500	1.140	1200	0	1.008	0.400	375							1	1.008	0.360	375											Rainfall Methodology		FSR	Analysis Speed		Normal	FSR Region	England and Wales		Skip Steady State	x		M5-60 (mm)	17.000		Drain Down Time (mins)	240		Ratio-R	0.400		Additional Storage (m³/ha)	20.0		Summer CV	0.750		Check Discharge Rate(s)	✓		Winter CV	0.840		1 year (l/s)	11.5							30 year (l/s)	32.4						100 year (l/s)	43.1						Check Discharge Volume	✓						100 year 360 minute (m³)	885	15	30	60	120	180	240	360	480	600	720	960	1440
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)																																																																																																																																																																																																				
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	40	0	0
30	0	0	0				
Pre-development Discharge Rate							
Site Makeup		Greenfield	Soil Index	3	Growth Factor 30 year	1.95	Q 1 year (l/s)
Greenfield Method		IH124	SPR	0.37	Growth Factor 100 year	2.48	Q 30 year (l/s)
Positively Drained Area (ha)		4.550	Region	7	Betterment (%)	0	Q 100 year (l/s)
SAAR (mm)		720	Growth Factor 1 year	0.85	QBar	13.5	
Pre-development Discharge Volume							
Site Makeup		Greenfield	Soil Index	3	Return Period (years)	100	Betterment (%)
Greenfield Method		FSR/FEH	SPR	0.37	Climate Change (%)	0	PR
Positively Drained Area (ha)		4.550	CWI	108.148	Storm Duration (mins)	360	Runoff Volume (m³)
							885
Node Outfall 1 Surcharged Outfall							
Overrides Design Area		x	Depression Storage Area (m²)		0	Evapo-transpiration (mm/day)	
Overrides Design Additional Inflow		x	Depression Storage Depth (mm)		0		
Applies to All storms							
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.000	240	1.126	360	1.300	480	1.126
60	0.336	300	1.256	420	1.256	540	0.919
						660	0.336
							</

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Node Attenuation Pond Depth/Area Storage Structure Base Inf Coefficient (m/hr) 0.00000 Side Inf Coefficient (m/hr) 0.00000 Depth (m) 0.000 Area (m²) 1170.0 Inf Area (m²) 0.0 Safety Factor 2.0 Porosity 1.00 Invert Level (m) 0.450 Time to half empty (mins)					
Depth (m) 0.000 Area (m²) 1170.0 Inf Area (m²) 0.0 Depth (m) 1.100 Area (m²) 1700.0 Inf Area (m²) 0.0					
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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.48%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S001	10	1.986	0.081	10.1	0.2067	0.0000	OK
15 minute winter	S002	11	1.801	0.096	15.9	0.2038	0.0000	OK
15 minute winter	S003	11	1.570	0.110	20.4	0.1916	0.0000	OK
15 minute winter	S004	12	1.330	0.115	22.0	0.1672	0.0000	OK
15 minute winter	ACO Qmax 350 (equivalent manhole diameter)	11	1.792	0.152	18.8	0.8904	0.0000	OK
15 minute winter	S005	11	1.736	0.106	18.0	0.2696	0.0000	OK
15 minute winter	S006	11	1.821	0.086	11.3	0.3723	0.0000	OK
15 minute winter	S007	12	1.578	0.133	28.5	0.1500	0.0000	OK
15 minute winter	S008	11	1.625	0.200	72.7	2.1662	0.0000	OK
15 minute winter	S009	12	1.366	0.251	106.3	0.9949	0.0000	OK
15 minute winter	S010	12	1.228	0.263	118.7	0.9664	0.0000	OK
15 minute winter	S011	11	1.651	0.141	37.3	0.8727	0.0000	OK
15 minute winter	S012	12	1.309	0.174	55.6	0.8900	0.0000	OK
15 minute winter	S013	13	1.060	0.305	186.7	0.7766	0.0000	OK
15 minute winter	S014	13	1.000	0.260	189.1	0.6622	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S001	1.000	S002	9.8	0.780	0.264	0.3074	
15 minute winter	S002	1.001	S003	15.8	0.746	0.226	1.3167	
15 minute winter	S003	1.002	S004	19.8	0.841	0.284	1.4755	
15 minute winter	S004	1.003	S013	21.1	0.875	0.299	0.9486	
15 minute winter	ACO Qmax 350 (equivalent manhole diameter)	Qmax link	S005	18.0	0.633	0.833	0.7252	
15 minute winter	S005	2.000	S007	17.5	0.823	0.251	0.5926	
15 minute winter	S006	3.000	S007	10.9	0.801	0.298	0.3802	
15 minute winter	S007	2.001	S009	27.4	0.849	0.258	2.0372	
15 minute winter	S008	4.000	S009	67.3	1.070	0.391	5.1834	
15 minute winter	S009	2.002	S010	107.0	1.035	0.440	6.1915	
15 minute winter	S010	2.003	S013	115.3	1.167	0.480	5.3637	
15 minute winter	S011	5.000	S012	33.7	0.937	0.293	3.2622	
15 minute winter	S012	5.001	S013	52.8	0.996	0.307	4.2739	
15 minute winter	S013	1.004	S014	189.1	1.449	0.423	0.4620	
15 minute winter	S014	1.005	S015	189.5	1.489	0.291	2.5616	
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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.48%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter		S015	13	0.854	0.294	189.5	0.7494	0.0000	OK
720 minute winter		Attenuation Pond	675	0.707	0.257	19.8	316.5767	0.0000	OK
720 minute winter		S016	675	0.707	0.267	7.4	0.6791	0.0000	OK
600 minute winter		S017	645	0.703	0.303	7.5	0.3427	0.0000	OK
240 minute winter		Outfall 1	360	1.660	1.300	0.0	0.0000	0.0000	OK
Link Event		US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
(Upstream Depth)									
15 minute winter		S015	1.006a	Attenuation Pond	189.3	3.082	0.604	3.7462	
720 minute winter		Attenuation Pond	1.006b	S016	7.4	0.084	0.035	2.4588	
720 minute winter		S016	1.007	S017	7.5	0.721	0.032	0.7779	
600 minute winter		S017	1.008	Outfall 1	7.8	0.991	0.028	0.2120	73.5
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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.48%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter S001	ACO Qmax 350 (equivalent manhole diameter)	10	2.044	0.139	24.8	0.3552	0.0000	OK
15 minute winter S002		11	1.863	0.158	39.1	0.3367	0.0000	OK
15 minute winter S003		11	1.650	0.190	50.4	0.3319	0.0000	OK
15 minute winter S004		12	1.424	0.209	55.9	0.3045	0.0000	OK
15 minute winter S005		11	1.888	0.248	46.0	1.4505	0.0000	OK
15 minute winter S006		11	1.812	0.182	44.0	0.4624	0.0000	OK
15 minute winter S007		11	1.884	0.149	27.7	0.6435	0.0000	OK
15 minute winter S008		13	1.694	0.249	70.9	0.2813	0.0000	OK
15 minute winter S009		11	1.802	0.377	177.6	4.0845	0.0000	OK
15 minute winter S010		12	1.658	0.543	271.5	2.1531	0.0000	SURCHARGED
15 minute winter S011		12	1.496	0.531	277.2	1.9500	0.0000	SURCHARGED
15 minute winter S012		11	1.762	0.252	91.2	1.5584	0.0000	OK
15 minute winter S013		11	1.447	0.312	142.2	1.5956	0.0000	OK
15 minute winter S014		12	1.324	0.569	450.6	1.4484	0.0000	OK
		12	1.206	0.466	450.4	1.1856	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter S001		1.000	S002	24.0	0.979	0.649	0.6046	
15 minute winter S002		1.001	S003	39.2	0.925	0.562	2.6152	
15 minute winter S003		1.002	S004	49.3	1.015	0.707	3.0175	
15 minute winter S004		1.003	S013	53.8	1.020	0.763	2.3442	
15 minute winter S005	ACO Qmax 350 (equivalent manhole diameter)	Qmax link	S005	44.0	0.831	2.040	1.3344	
15 minute winter S006		2.000	S007	44.1	1.056	0.633	1.1556	
15 minute winter S007		3.000	S007	26.8	1.010	0.730	0.7386	
15 minute winter S008		2.001	S009	68.1	0.882	0.641	5.8516	
15 minute winter S009		4.000	S009	168.6	1.235	0.979	12.0592	
15 minute winter S010		2.002	S010	242.7	1.187	0.998	12.7372	
15 minute winter S011		2.003	S013	263.4	1.262	1.095	11.5763	
15 minute winter S012		5.000	S012	88.7	1.165	0.772	6.8482	
15 minute winter S013		5.001	S013	138.2	1.093	0.804	10.8752	
15 minute winter S014		1.004	S014	450.4	1.743	1.008	0.9044	
		1.005	S015	450.5	1.927	0.692	4.7053	
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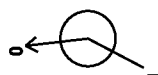
Eireng Consulting Engineers		File: 212039_Storm Calculations.pfd Network: Outfall 1 Jakub Matveev 01/05/2021		Page 13 Oldlands Farm Bognor					
Results for 30 year Critical Storm Duration. Lowest mass balance: 99.48%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter		S015	12	1.022	0.462	450.5	1.1761	0.0000	OK
600 minute winter		Attenuation Pond	615	0.977	0.527	49.0	683.3070	0.0000	OK
600 minute winter		S016	615	0.977	0.537	7.6	1.3660	0.0000	SURCHARGED
600 minute winter		S017	600	0.977	0.577	7.9	0.6526	0.0000	SURCHARGED
600 minute summer		Outfall 1	360	1.660	1.300	8.2	0.0000	0.0000	OK
Link Event		US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
(Upstream Depth)									
15 minute winter		S015	1.006a	Attenuation Pond	449.4	3.760	1.434	6.7435	
600 minute winter		Attenuation Pond	1.006b	S016	7.6	0.086	0.036	5.7997	
600 minute winter		S016	1.007	S017	7.9	0.723	0.033	1.1836	
600 minute winter		S017	1.008	Outfall 1	8.7	0.997	0.031	0.2273	99.9
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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.48%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S001	12	2.573	0.668	44.6	1.7060	0.0000	SURCHARGED
15 minute winter	S002	12	2.459	0.754	69.7	1.6040	0.0000	FLOOD RISK
15 minute winter	S003	12	2.307	0.847	78.5	1.4767	0.0000	SURCHARGED
15 minute winter	S004	12	2.053	0.838	75.9	1.2221	0.0000	SURCHARGED
15 minute summer	ACO Qmax 350 (equivalent manhole diameter)	11	2.180	0.540	79.0	6.5266	0.0000	FLOOD RISK
15 minute winter	S005	12	2.784	1.154	70.6	2.9374	0.0000	FLOOD RISK
15 minute winter	S006	12	2.800	1.065	49.9	4.6104	0.4135	FLOOD
15 minute winter	S007	12	2.676	1.231	106.3	1.3918	0.0000	SURCHARGED
15 minute winter	S008	10	2.770	1.345	320.3	14.5771	16.4559	FLOOD
15 minute winter	S009	12	2.513	1.398	331.3	5.5489	0.0000	SURCHARGED
15 minute winter	S010	12	2.211	1.246	379.7	4.5770	0.0000	SURCHARGED
15 minute winter	S011	12	2.702	1.192	164.4	7.3648	0.0000	FLOOD RISK
15 minute winter	S012	12	2.245	1.110	230.1	5.6794	0.0000	FLOOD RISK
15 minute winter	S013	12	1.829	1.074	660.5	2.7345	0.0000	SURCHARGED
15 minute winter	S014	12	1.658	0.918	661.1	2.3364	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S001	1.000	S002	42.4	1.102	1.148	0.9759	
15 minute winter	S002	1.001	S003	58.2	1.009	0.834	4.3392	
15 minute winter	S003	1.002	S004	67.5	1.073	0.968	4.3392	
15 minute winter	S004	1.003	S013	77.1	1.095	1.094	2.7756	
15 minute summer	ACO Qmax 350 (equivalent manhole diameter)	Qmax link	S005	68.4	1.004	3.169	1.7586	
15 minute winter	S005	2.000	S007	65.8	1.043	0.943	1.9479	
15 minute winter	S006	3.000	S007	40.5	1.038	1.103	1.1078	
15 minute winter	S007	2.001	S009	104.0	0.943	0.978	6.9516	
15 minute winter	S008	4.000	S009	236.2	1.491	1.371	12.9623	
15 minute winter	S009	2.002	S010	319.7	1.480	1.315	12.7377	
15 minute winter	S010	2.003	S013	371.9	1.721	1.546	11.7165	
15 minute winter	S011	5.000	S012	135.6	1.229	1.180	9.9267	
15 minute winter	S012	5.001	S013	218.1	1.377	1.270	12.7664	
15 minute winter	S013	1.004	S014	661.1	2.347	1.479	0.9969	
15 minute winter	S014	1.005	S015	659.7	2.342	1.013	5.6671	
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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.48%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter		S015	12	1.334	0.774	659.7	1.9702	0.0000	SURCHARGED
720 minute winter		Attenuation Pond	705	1.323	0.873	76.6	1204.8330	0.0000	FLOOD RISK
720 minute winter		S016	705	1.323	0.883	7.7	2.2469	0.0000	FLOOD RISK
480 minute winter		S017	512	1.306	0.906	11.9	1.0244	0.0000	FLOOD RISK
360 minute winter		Outfall 1	360	1.660	1.300	2.3	0.0000	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter		S015	1.006a	Attenuation Pond	657.4	3.791	2.098	9.6756	
720 minute winter		Attenuation Pond	1.006b	S016	7.7	0.088	0.037	6.8636	
720 minute winter		S016	1.007	S017	13.8	0.711	0.058	1.1836	
480 minute winter		S017	1.008	Outfall 1	15.3	0.970	0.055	0.2273	85.3
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Design Settings Rainfall Methodology Return Period (years) Additional Flow (%) FSR Region M5-60 (mm) Ratio-R CV Time of Entry (mins) FSR 2 0 England and Wales 17.000 0.400 0.750 5.00 Maximum Time of Concentration (mins) Maximum Rainfall (mm/hr) Minimum Velocity (m/s) Connection Type Minimum Backdrop Height (m) Preferred Cover Depth (m) Include Intermediate Ground Enforce best practice design rules 30.00 50.0 1.00 Level Soffits 0.200 1.200 ✓ ✓																																																																																						
Nodes <table><tr><th>Name</th><th>Area (ha)</th><th>T of E (mins)</th><th>Add Inflow (l/s)</th><th>Cover Level (m)</th><th>Diameter (mm)</th><th>Easting (m)</th><th>Northing (m)</th><th>Depth (m)</th></tr><tr><td>S101</td><td>0.470</td><td>8.00</td><td>0.0</td><td>3.340</td><td>1500</td><td>494594.573</td><td>101715.724</td><td>1.315</td></tr><tr><td>S102</td><td>0.412</td><td>6.00</td><td>0.0</td><td>3.220</td><td>1800</td><td>494623.885</td><td>101771.716</td><td>1.555</td></tr><tr><td>S103</td><td>0.243</td><td>5.00</td><td>0.0</td><td>2.950</td><td>1800</td><td>494619.696</td><td>101807.962</td><td>1.390</td></tr><tr><td>S104</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.950</td><td>1800</td><td>494545.927</td><td>101846.789</td><td>1.630</td></tr><tr><td>S105</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.870</td><td>1800</td><td>494551.247</td><td>101856.892</td><td>1.660</td></tr><tr><td>Attenuation Tank Outfall 2</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.870</td><td></td><td>494597.143</td><td>101832.864</td><td>1.765</td></tr><tr><td>S106</td><td>0.020</td><td>5.00</td><td>0.0</td><td>1.800</td><td>1800</td><td>494643.040</td><td>101808.837</td><td>0.800</td></tr><tr><td>Outfall 2</td><td>0.000</td><td>5.00</td><td>0.0</td><td>1.800</td><td></td><td>494646.802</td><td>101806.867</td><td>1.200</td></tr></table>						Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	S101	0.470	8.00	0.0	3.340	1500	494594.573	101715.724	1.315	S102	0.412	6.00	0.0	3.220	1800	494623.885	101771.716	1.555	S103	0.243	5.00	0.0	2.950	1800	494619.696	101807.962	1.390	S104	0.000	5.00	0.0	2.950	1800	494545.927	101846.789	1.630	S105	0.000	5.00	0.0	2.870	1800	494551.247	101856.892	1.660	Attenuation Tank Outfall 2	0.000	5.00	0.0	2.870		494597.143	101832.864	1.765	S106	0.020	5.00	0.0	1.800	1800	494643.040	101808.837	0.800	Outfall 2	0.000	5.00	0.0	1.800		494646.802	101806.867	1.200
Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)																																																																														
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Links <table><tr><th>Name</th><th>US Node</th><th>DS Node</th><th>Length (m)</th><th>ks (mm) / n</th><th>US IL (m)</th><th>DS IL (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>Dia (mm)</th><th>T of C (mins)</th><th>Rain (mm/hr)</th></tr><tr><td>10.000</td><td>S101</td><td>S102</td><td>63.200</td><td>0.600</td><td>2.025</td><td>1.815</td><td>0.210</td><td>301.0</td><td>375</td><td>9.01</td><td>45.1</td></tr><tr><td>10.001</td><td>S102</td><td>S103</td><td>36.487</td><td>0.600</td><td>1.665</td><td>1.560</td><td>0.105</td><td>347.5</td><td>525</td><td>9.52</td><td>43.8</td></tr><tr><td>10.002</td><td>S103</td><td>S104</td><td>83.363</td><td>0.600</td><td>1.560</td><td>1.320</td><td>0.240</td><td>347.3</td><td>525</td><td>10.68</td><td>41.2</td></tr><tr><td>10.003</td><td>S104</td><td>S105</td><td>11.418</td><td>0.600</td><td>1.320</td><td>1.210</td><td>0.110</td><td>103.8</td><td>525</td><td>10.77</td><td>41.0</td></tr><tr><td>10.004a</td><td>S105</td><td>Attenuation Tank Outfall 2</td><td>51.805</td><td>0.600</td><td>1.210</td><td>1.105</td><td>0.105</td><td>493.4</td><td>525</td><td>11.63</td><td>39.2</td></tr><tr><td>10.004b</td><td>Attenuation Tank Outfall 2</td><td>S106</td><td>51.806</td><td>0.600</td><td>1.105</td><td>1.000</td><td>0.105</td><td>493.4</td><td>525</td><td>12.50</td><td>37.7</td></tr><tr><td>10.005</td><td>S106</td><td>Outfall 2</td><td>4.247</td><td>0.600</td><td>1.000</td><td>0.600</td><td>0.400</td><td>10.6</td><td>225</td><td>12.51</td><td>37.6</td></tr></table>											Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	10.000	S101	S102	63.200	0.600	2.025	1.815	0.210	301.0	375	9.01	45.1	10.001	S102	S103	36.487	0.600	1.665	1.560	0.105	347.5	525	9.52	43.8	10.002	S103	S104	83.363	0.600	1.560	1.320	0.240	347.3	525	10.68	41.2	10.003	S104	S105	11.418	0.600	1.320	1.210	0.110	103.8	525	10.77	41.0	10.004a	S105	Attenuation Tank Outfall 2	51.805	0.600	1.210	1.105	0.105	493.4	525	11.63	39.2	10.004b	Attenuation Tank Outfall 2	S106	51.806	0.600	1.105	1.000	0.105	493.4	525	12.50	37.7	10.005	S106	Outfall 2	4.247	0.600	1.000	0.600	0.400	10.6	225	12.51	37.6
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)																																																																																															
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Pipeline Schedule											
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)	
10.000	63.200	301.0	375	Circular	3.340	2.025	0.940	3.220	1.815	1.030	
10.001	36.487	347.5	525	Circular	3.220	1.665	1.030	2.950	1.560	0.865	
10.002	83.363	347.3	525	Circular	2.950	1.560	0.865	2.950	1.320	1.105	
10.003	11.418	103.8	525	Circular	2.950	1.320	1.105	2.870	1.210	1.135	
10.004a	51.805	493.4	525	Circular	2.870	1.210	1.135	2.870	1.105	1.240	
10.004b	51.806	493.4	525	Circular	2.870	1.105	1.240	1.800	1.000	0.275	
10.005	4.247	10.6	225	Circular	1.800	1.000	0.575	1.800	0.600	0.975	
Manhole Schedule											
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type			
10.000	S101	1500	Manhole	Adoptable	S102	1800	Manhole	Adoptable			
10.001	S102	1800	Manhole	Adoptable	S103	1800	Manhole	Adoptable			
10.002	S103	1800	Manhole	Adoptable	S104	1800	Manhole	Adoptable			
10.003	S104	1800	Manhole	Adoptable	S105	1800	Manhole	Adoptable			
10.004a	S105	1800	Manhole	Adoptable	Attenuation Tank Outfall 2		Junction				
10.004b	Attenuation Tank Outfall 2		Junction		S106	1800	Manhole	Adoptable			
10.005	S106	1800	Manhole	Adoptable	Outfall 2		Junction				
Manhole Schedule											
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)		
S101	494594.573	101715.724	3.340	1.315	1500						
S102	494623.885	101771.716	3.220	1.555	1800		0	10.000	2.025	375	
							1	10.000	1.815	375	
							0	10.001	1.665	525	

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Node S106 Online Hydro-Brake® Control Flap Valve x Replaces Downstream Link ✓ Invert Level (m) 1.000 Design Depth (m) 0.610 Design Flow (l/s) 7.1 Objective (HE) Minimise upstream storage Sump Available ✓ Product Number CTL-SHE-0130-7100-0610-7100 Min Outlet Diameter (m) 0.150 Min Node Diameter (mm) 1200			
Node Attenuation Tank Outfall 2 Depth/Area Storage Structure Base Inf Coefficient (m/hr) 0.00000 Side Inf Coefficient (m/hr) 0.00000 Safety Factor 2.0 Porosity 0.95 Invert Level (m) 1.105 Time to half empty (mins) Depth (m) Area (m²) Inf Area (m²) Depth (m) Area (m²) Inf Area (m²) 0.000 2646.0 0.0 0.400 2646.0 0.0 0.401 0.0 0.0			
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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.73%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter		S101	12	2.187	0.162	43.7	1.4407	0.0000	OK
15 minute winter		S102	12	1.884	0.219	84.8	1.7173	0.0000	OK
15 minute winter		S103	12	1.800	0.240	110.0	1.4499	0.0000	OK
15 minute winter		S104	12	1.529	0.209	108.7	0.5309	0.0000	OK
15 minute winter		S105	13	1.449	0.239	106.8	0.6090	0.0000	OK
600 minute winter		Attenuation Tank Outfall 2	615	1.183	0.078	13.9	197.1330	0.0000	OK
600 minute winter		S106	615	1.183	0.183	7.0	0.5581	0.0000	OK
60 minute summer		Outfall 2	275	1.800	1.200	1.8	0.0000	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter		S101	10.000	S102	42.9	0.995	0.374	2.7292	77.3
15 minute winter		S102	10.001	S103	84.2	0.929	0.325	3.3081	
15 minute winter		S103	10.002	S104	108.7	1.236	0.420	7.3365	
15 minute winter		S104	10.003	S105	106.8	1.219	0.225	1.0015	
15 minute winter		S105	10.004a	Attenuation Tank Outfall 2	107.8	2.766	0.497	2.5011	
600 minute winter		Attenuation Tank Outfall 2	10.004b	S106	7.0	0.240	0.032	2.2573	
600 minute winter		S106	Hydro-Brake®	Outfall 2	7.0				
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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.73%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S101	12	2.322	0.297	106.8	2.6467	0.0000	OK
15 minute winter	S102	12	2.092	0.427	212.2	3.3524	0.0000	OK
15 minute winter	S103	12	2.009	0.449	272.0	2.7095	0.0000	OK
15 minute winter	S104	12	1.692	0.372	265.1	0.9480	0.0000	OK
15 minute winter	S105	12	1.584	0.374	263.0	0.9522	0.0000	OK
600 minute winter	Attenuation Tank Outfall 2	600	1.279	0.174	30.9	437.7241	0.0000	OK
600 minute winter	S106	600	1.279	0.279	7.0	0.8495	0.0000	SURCHARGED
60 minute summer	Outfall 2	275	1.800	1.200	7.1	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S101	10.000	S102	105.7	1.260	0.921	5.7196	
15 minute winter	S102	10.001	S103	206.0	1.085	0.796	7.0198	
15 minute winter	S103	10.002	S104	265.1	1.463	1.024	15.0198	
15 minute winter	S104	10.003	S105	263.0	1.602	0.553	1.8753	
15 minute winter	S105	10.004a	Attenuation Tank Outfall 2	262.9	3.526	1.213	4.3468	
600 minute winter	Attenuation Tank Outfall 2	10.004b	S106	7.0	0.100	0.032	4.6375	
600 minute winter	S106	Hydro-Brake®	Outfall 2	7.1				97.2
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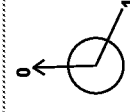
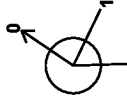
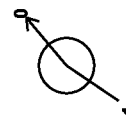
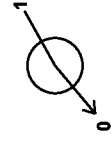
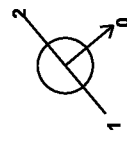
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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.73%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter		S101	12	3.340	1.315	192.7	11.7232	4.9045	FLOOD
15 minute winter		S102	12	2.976	1.311	344.2	10.2868	0.0000	FLOOD RISK
15 minute winter		S103	12	2.756	1.196	436.3	7.2249	0.0000	FLOOD RISK
15 minute winter		S104	12	2.020	0.700	425.2	1.7827	0.0000	SURCHARGED
15 minute winter		S105	12	1.835	0.625	424.1	1.5906	0.0000	SURCHARGED
600 minute winter		Attenuation Tank Outfall 2	585	1.418	0.313	56.2	786.6801	0.0000	OK
600 minute winter		S106	585	1.418	0.418	7.1	1.2721	0.0000	SURCHARGED
60 minute summer		Outfall 2	275	1.800	1.200	7.1	0.0000	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter		S101	10.000	S102	186.9	1.694	1.629	6.9708	
15 minute winter		S102	10.001	S103	324.1	1.501	1.252	7.8824	
15 minute winter		S103	10.002	S104	425.2	1.968	1.642	18.0091	
15 minute winter		S104	10.003	S105	424.1	1.963	0.891	2.4667	
15 minute winter		S105	10.004a	Attenuation Tank Outfall 2	419.9	3.687	1.937	5.9287	
600 minute winter		Attenuation Tank Outfall 2	10.004b	S106	7.1	0.053	0.033	8.2493	
600 minute winter		S106	Hydro-Brake®	Outfall 2	7.1				104.5
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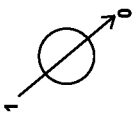
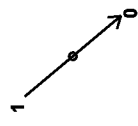
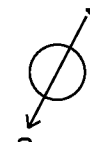
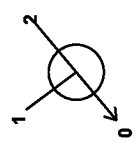
Eireng Consulting Engineers		File: 212039_Storm Calculations.pfd Network: Outfall 3 Jakub Matveev 01/05/2021		Page 1 Oldlands Farm Bognor																																																																																																																																																																												
Design Settings <table><tr><td>Rainfall Methodology</td><td>FSR</td><td>Maximum Time of Concentration (mins)</td><td>30.00</td></tr><tr><td>Return Period (years)</td><td>2</td><td>Maximum Rainfall (mm/hr)</td><td>50.0</td></tr><tr><td>Additional Flow (%)</td><td>0</td><td>Minimum Velocity (m/s)</td><td>1.00</td></tr><tr><td>FSR Region</td><td>England and Wales</td><td>Connection Type</td><td>Level Soffits</td></tr><tr><td>M5-60 (mm)</td><td>17.000</td><td>Minimum Backdrop Height (m)</td><td>0.200</td></tr><tr><td>Ratio-R</td><td>0.400</td><td>Preferred Cover Depth (m)</td><td>1.200</td></tr><tr><td>CV</td><td>0.750</td><td>Include Intermediate Ground</td><td>✓</td></tr><tr><td>Time of Entry (mins)</td><td>5.00</td><td>Enforce best practice design rules</td><td>✓</td></tr></table>						Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00	Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0	Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	FSR Region	England and Wales	Connection Type	Level Soffits	M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200	Ratio-R	0.400	Preferred Cover Depth (m)	1.200	CV	0.750	Include Intermediate Ground	✓	Time of Entry (mins)	5.00	Enforce best practice design rules	✓																																																																																																																																											
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FSR Region	England and Wales	Connection Type	Level Soffits																																																																																																																																																																													
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Ratio-R	0.400	Preferred Cover Depth (m)	1.200																																																																																																																																																																													
CV	0.750	Include Intermediate Ground	✓																																																																																																																																																																													
Time of Entry (mins)	5.00	Enforce best practice design rules	✓																																																																																																																																																																													
Nodes <table><tr><th>Name</th><th>Area (ha)</th><th>T of E (mins)</th><th>Add Inflow (l/s)</th><th>Cover Level (m)</th><th>Diameter (mm)</th><th>Easting (m)</th><th>Northing (m)</th><th>Depth (m)</th></tr><tr><td>S201</td><td>0.082</td><td>5.00</td><td>0.0</td><td>3.050</td><td>1200</td><td>494351.863</td><td>101753.966</td><td>0.980</td></tr><tr><td>S202</td><td>0.067</td><td>5.00</td><td>0.0</td><td>2.830</td><td>1200</td><td>494312.260</td><td>101772.481</td><td>1.055</td></tr><tr><td>S203</td><td>0.165</td><td>5.00</td><td>0.0</td><td>2.750</td><td>1200</td><td>494349.111</td><td>101776.888</td><td>0.900</td></tr><tr><td>S204</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.800</td><td>1500</td><td>494311.511</td><td>101795.035</td><td>1.190</td></tr><tr><td>S205</td><td>0.056</td><td>5.00</td><td>0.0</td><td>2.750</td><td>1500</td><td>494319.687</td><td>101807.113</td><td>1.190</td></tr><tr><td>S206</td><td>0.184</td><td>5.00</td><td>0.0</td><td>3.100</td><td>1200</td><td>494433.625</td><td>101881.157</td><td>1.150</td></tr><tr><td>S207</td><td>0.000</td><td>5.00</td><td>0.0</td><td>3.150</td><td>1200</td><td>494357.001</td><td>101838.401</td><td>1.550</td></tr><tr><td>S208</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.950</td><td>1800</td><td>494340.913</td><td>101824.916</td><td>1.560</td></tr><tr><td>S209</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.900</td><td>1800</td><td>494352.487</td><td>101811.066</td><td>1.665</td></tr><tr><td>Attenuation Tank Outfall 3</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.550</td><td></td><td>494369.925</td><td>101790.278</td><td>1.385</td></tr><tr><td>S210</td><td>0.080</td><td>5.00</td><td>0.0</td><td>3.250</td><td>1200</td><td>494565.328</td><td>101722.095</td><td>0.820</td></tr><tr><td>S211</td><td>0.045</td><td>5.00</td><td>0.0</td><td>3.250</td><td>1200</td><td>494492.997</td><td>101759.755</td><td>1.230</td></tr><tr><td>S212</td><td>0.080</td><td>5.00</td><td>0.0</td><td>2.900</td><td>1500</td><td>494420.667</td><td>101797.416</td><td>1.440</td></tr><tr><td>S213</td><td>0.275</td><td>5.00</td><td>0.0</td><td>2.660</td><td>1200</td><td>494417.900</td><td>101840.879</td><td>0.930</td></tr><tr><td>S214</td><td>0.158</td><td>5.00</td><td>0.0</td><td>2.830</td><td>1500</td><td>494382.591</td><td>101812.506</td><td>1.355</td></tr><tr><td>S215</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.630</td><td>1800</td><td>494404.201</td><td>101783.609</td><td>1.350</td></tr><tr><td>S216</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.730</td><td>1800</td><td>494387.364</td><td>101769.491</td><td>1.630</td></tr><tr><td>Outfall 3</td><td>0.000</td><td>5.00</td><td>0.0</td><td>2.000</td><td></td><td>494391.387</td><td>101764.693</td><td>1.400</td></tr></table>						Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	S201	0.082	5.00	0.0	3.050	1200	494351.863	101753.966	0.980	S202	0.067	5.00	0.0	2.830	1200	494312.260	101772.481	1.055	S203	0.165	5.00	0.0	2.750	1200	494349.111	101776.888	0.900	S204	0.000	5.00	0.0	2.800	1500	494311.511	101795.035	1.190	S205	0.056	5.00	0.0	2.750	1500	494319.687	101807.113	1.190	S206	0.184	5.00	0.0	3.100	1200	494433.625	101881.157	1.150	S207	0.000	5.00	0.0	3.150	1200	494357.001	101838.401	1.550	S208	0.000	5.00	0.0	2.950	1800	494340.913	101824.916	1.560	S209	0.000	5.00	0.0	2.900	1800	494352.487	101811.066	1.665	Attenuation Tank Outfall 3	0.000	5.00	0.0	2.550		494369.925	101790.278	1.385	S210	0.080	5.00	0.0	3.250	1200	494565.328	101722.095	0.820	S211	0.045	5.00	0.0	3.250	1200	494492.997	101759.755	1.230	S212	0.080	5.00	0.0	2.900	1500	494420.667	101797.416	1.440	S213	0.275	5.00	0.0	2.660	1200	494417.900	101840.879	0.930	S214	0.158	5.00	0.0	2.830	1500	494382.591	101812.506	1.355	S215	0.000	5.00	0.0	2.630	1800	494404.201	101783.609	1.350	S216	0.000	5.00	0.0	2.730	1800	494387.364	101769.491	1.630	Outfall 3	0.000	5.00	0.0	2.000		494391.387	101764.693	1.400
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Links											
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
24.001	S214	S215	36.084	0.600	1.475	1.355	0.120	300.7	375	6.34	50.0
23.003	S215	S216	21.973	0.600	1.280	1.100	0.180	122.1	450	8.43	46.7
20.006	S216	Outfall 3	6.261	0.600	1.100	0.600	0.500	12.5	300	8.45	46.7
Pipeline Schedule											
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)		
24.001	1.039	114.8	58.7	0.980	0.900	0.433	0.0	190	1.045		
23.003	1.839	292.4	80.8	0.900	1.180	0.638	0.0	161	1.582		
20.006	4.466	315.7	150.7	1.330	1.100	1.192	0.0	146	4.419		
Pipeline Schedule											
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)	
20.000	43.717	198.7	225	Circular	3.050	2.070	0.755	2.830	1.850	0.755	
20.001	22.566	250.7	300	Circular	2.830	1.775	0.755	2.800	1.685	0.815	
21.000	41.750	253.0	300	Circular	2.750	1.850	0.600	2.800	1.685	0.815	
20.002	14.585	291.7	375	Circular	2.800	1.610	0.815	2.750	1.560	0.815	
20.003	27.704	291.6	375	Circular	2.750	1.560	0.815	2.950	1.465	1.110	
22.000	87.746	250.7	300	Circular	3.100	1.950	0.850	3.150	1.600	1.250	
22.001	20.992	349.9	300	Circular	3.150	1.600	1.250	2.950	1.540	1.110	
Pipeline Schedule											
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type			
20.000	S201	1200	Manhole	Adoptable	S202	1200	Manhole	Adoptable			
20.001	S202	1200	Manhole	Adoptable	S204	1500	Manhole	Adoptable			
21.000	S203	1200	Manhole	Adoptable	S204	1500	Manhole	Adoptable			
20.002	S204	1500	Manhole	Adoptable	S205	1500	Manhole	Adoptable			
20.003	S205	1500	Manhole	Adoptable	S208	1800	Manhole	Adoptable			
22.000	S206	1200	Manhole	Adoptable	S207	1200	Manhole	Adoptable			
22.001	S207	1200	Manhole	Adoptable	S208	1800	Manhole	Adoptable			

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Pipeline Schedule											
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)	
20.004	18.049	116.4	450	Circular	2.950	1.390	1.110	2.900	1.235	1.215	
20.005a	27.133	387.6	450	Circular	2.900	1.235	1.215	2.550	1.165	0.935	
20.005b	27.133	417.4	450	Circular	2.550	1.165	0.935	2.730	1.100	1.180	
23.000	81.548	198.9	225	Circular	3.250	2.430	0.595	3.250	2.020	1.005	
23.001	81.547	198.9	225	Circular	3.250	2.020	1.005	2.900	1.610	1.065	
23.002	21.489	204.7	375	Circular	2.900	1.460	1.065	2.630	1.355	0.900	
24.000	45.296	251.6	300	Circular	2.660	1.730	0.630	2.830	1.550	0.980	
24.001	36.084	300.7	375	Circular	2.830	1.475	0.980	2.630	1.355	0.900	
23.003	21.973	122.1	450	Circular	2.630	1.280	0.900	2.730	1.100	1.180	
20.006	6.261	12.5	300	Circular	2.730	1.100	1.330	2.000	0.600	1.100	
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type	Node Type		
20.004	S208	1800	Manhole	Adoptable	S209	1800	Manhole	Adoptable	Manhole	Adoptable	
20.005a	S209	1800	Manhole	Adoptable	Attenuation Tank Outfall 3				Junction		
20.005b	Attenuation Tank Outfall 3		Junction		S216	1800	Manhole	Adoptable	Manhole	Adoptable	
23.000	S210	1200	Manhole	Adoptable	S211	1200	Manhole	Adoptable	Manhole	Adoptable	
23.001	S211	1200	Manhole	Adoptable	S212	1500	Manhole	Adoptable	Manhole	Adoptable	
23.002	S212	1500	Manhole	Adoptable	S215	1800	Manhole	Adoptable	Manhole	Adoptable	
24.000	S213	1200	Manhole	Adoptable	S214	1500	Manhole	Adoptable	Manhole	Adoptable	
24.001	S214	1500	Manhole	Adoptable	S215	1800	Manhole	Adoptable	Manhole	Adoptable	
23.003	S215	1800	Manhole	Adoptable	S216	1800	Manhole	Adoptable	Manhole	Adoptable	
20.006	S216	1800	Manhole	Adoptable	Outfall 3				Junction		
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Manhole Schedule										
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S201	494351.863	101753.966	3.050	0.980	1200					
S202	494312.260	101772.481	2.830	1.055	1200		0	20.000	2.070	225
							1	20.000	1.850	225
S203	494349.111	101776.888	2.750	0.900	1200		0	20.001	1.775	300
S204	494311.511	101795.035	2.800	1.190	1500		0	21.000	1.850	300
							1	21.000	1.685	300
							2	20.001	1.685	300
S205	494319.687	101807.113	2.750	1.190	1500		0	20.002	1.610	375
							1	20.002	1.560	375
S206	494433.625	101881.157	3.100	1.150	1200		0	20.003	1.560	375
S207	494357.001	101838.401	3.150	1.550	1200		0	22.000	1.950	300
							1	22.000	1.600	300
S208	494340.913	101824.916	2.950	1.560	1800		0	22.001	1.600	300
							1	20.003	1.465	375
							2	22.001	1.540	300
							0	20.004	1.390	450
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Manhole Schedule									
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S209	494352.487	101811.066	2.900	1.665	1800		1 20.004	1.235	450
Attenuation Tank Outfall 3									
	494369.925	101790.278	2.550	1.385			0 20.005a	1.235	450
							1 20.005a	1.165	450
S210	494565.328	101722.095	3.250	0.820	1200		0 20.005b	1.165	450
									
S211	494492.997	101759.755	3.250	1.230	1200		0 23.000	2.430	225
							1 23.000	2.020	225
S212	494420.667	101797.416	2.900	1.440	1500		0 23.001	2.020	225
							1 23.001	1.610	225
S213	494417.900	101840.879	2.660	0.930	1200		0 23.002	1.460	375
									
S214	494382.591	101812.506	2.830	1.355	1500		0 24.000	1.730	300
							1 24.000	1.550	300
S215	494404.201	101783.609	2.630	1.350	1800		0 24.001	1.475	375
							1 24.001	1.355	375
							2 23.002	1.355	375
							0 23.003	1.280	450
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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S216	494387.364	101769.491	2.730	1.630	1800	1 2	20.005b	1.100	450
							23.003	1.100	450
Outfall 3	494391.387	101764.693	2.000	1.400		1	20.006	1.100	300
							20.006	0.600	300

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	✓
Winter CV	0.840	1 year (l/s)	11.5
		30 year (l/s)	32.4
		100 year (l/s)	43.1
		Check Discharge Volume	✓
		100 year 360 minute (m³)	885

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	40	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Soil Index	3	Growth Factor 30 year	1.95	Q 1 year (l/s)
Greenfield Method	IH124	SPR	0.37	Growth Factor 100 year	2.48	Q 30 year (l/s)
Positively Drained Area (ha)	4.550	Region	7	Betterment (%)	0	Q 100 year (l/s)
SAAR (mm)	720	Growth Factor 1 year	0.85	QBar	13.5	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 98.85%									
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S201		11	2.148	0.078	9.8	0.2196	0.0000	OK
15 minute winter	S202		11	1.879	0.104	16.9	0.2502	0.0000	OK
15 minute winter	S203		11	1.959	0.109	19.7	0.5225	0.0000	OK
15 minute winter	S204		11	1.768	0.158	35.9	0.2795	0.0000	OK
15 minute winter	S205		11	1.721	0.161	42.2	0.4354	0.0000	OK
15 minute winter	S206		10	2.063	0.113	21.9	0.4908	0.0000	OK
15 minute winter	S207		12	1.725	0.125	21.6	0.1413	0.0000	OK
15 minute winter	S208		12	1.542	0.152	61.6	0.3874	0.0000	OK
15 minute winter	S209		12	1.410	0.175	62.0	0.4466	0.0000	OK
600 minute winter	Attenuation Tank Outfall 3		600	1.270	0.105	14.7	202.1182	0.0000	OK
15 minute winter	S210		11	2.506	0.076	9.5	0.2348	0.0000	OK
15 minute winter	S211		12	2.110	0.090	14.3	0.1684	0.0000	OK
15 minute winter	S212		12	1.559	0.099	20.2	0.2851	0.0000	OK
15 minute winter	S213		11	1.875	0.145	32.8	1.0207	0.0000	OK
15 minute winter	S214		11	1.652	0.177	49.2	0.7270	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
15 minute winter	S201	20.000	S202	9.4	0.773	0.255	0.5297		
15 minute winter	S202	20.001	S204	17.0	0.810	0.243	0.4728		
15 minute winter	S203	21.000	S204	19.0	0.844	0.273	0.9379		
15 minute winter	S204	20.002	S205	35.9	0.804	0.308	0.6509		
15 minute winter	S205	20.003	S208	41.3	0.979	0.354	1.1745		
15 minute winter	S206	22.000	S207	21.6	0.856	0.309	2.2531		
15 minute winter	S207	22.001	S208	20.3	0.801	0.344	0.5316		
15 minute winter	S208	20.004	S209	62.0	1.189	0.207	0.9416		
15 minute winter	S209	20.005a	Attenuation Tank Outfall 3	62.2	2.607	0.381	0.7904		
600 minute winter	Attenuation Tank Outfall 3	20.005b	S216	-7.9	-0.326	-0.050	1.1231		
15 minute winter	S210	23.000	S211	9.2	0.743	0.252	1.0585		
15 minute winter	S211	23.001	S212	12.3	0.837	0.335	1.2012		
15 minute winter	S212	23.002	S215	20.1	0.891	0.144	0.4840		
15 minute winter	S213	24.000	S214	31.5	0.972	0.451	1.4665		
15 minute winter	S214	24.001	S215	49.0	1.020	0.427	1.7342		
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Eireng Consulting Engineers		File: 212039_Storm Calculations.pfd Network: Outfall 3 Jakub Matveev 01/05/2021		Page 10 Oldlands Farm Bognor																																																																							
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Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S201		11	2.202	0.132	23.9	0.3715	0.0000	OK
15 minute winter	S202		11	1.959	0.184	41.8	0.4428	0.0000	OK
15 minute winter	S203		10	2.038	0.188	48.0	0.9031	0.0000	OK
15 minute winter	S204		11	1.899	0.289	88.4	0.5098	0.0000	OK
15 minute winter	S205		11	1.842	0.282	103.0	0.7639	0.0000	OK
15 minute winter	S206		10	2.145	0.195	53.5	0.8428	0.0000	OK
15 minute winter	S207		11	1.816	0.216	52.9	0.2445	0.0000	OK
15 minute winter	S208		12	1.660	0.270	151.4	0.6867	0.0000	OK
15 minute winter	S209		12	1.528	0.293	152.5	0.7466	0.0000	OK
600 minute winter	Attenuation Tank Outfall 3		585	1.395	0.230	32.3	441.7663	0.0000	OK
15 minute winter	S210		10	2.556	0.126	23.3	0.3878	0.0000	OK
15 minute winter	S211		12	2.185	0.165	35.5	0.3065	0.0000	OK
15 minute winter	S212		11	1.634	0.174	51.8	0.5000	0.0000	OK
15 minute winter	S213		11	2.024	0.294	79.9	2.0708	0.0000	OK
15 minute winter	S214		11	1.798	0.323	120.4	1.3259	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
15 minute winter	S201	20.000	S202	23.1	0.978	0.629	1.0335		
15 minute winter	S202	20.001	S204	41.6	0.901	0.596	1.1177		
15 minute winter	S203	21.000	S204	46.9	0.986	0.675	2.0673		
15 minute winter	S204	20.002	S205	87.6	0.974	0.752	1.3123		
15 minute winter	S205	20.003	S208	101.4	1.260	0.870	2.2345		
15 minute winter	S206	22.000	S207	52.9	1.046	0.757	4.4801		
15 minute winter	S207	22.001	S208	50.6	1.044	0.857	1.0140		
15 minute winter	S208	20.004	S209	152.5	1.462	0.509	1.8830		
15 minute winter	S209	20.005a	Attenuation Tank Outfall 3	154.6	3.109	0.947	1.5664		
600 minute winter	Attenuation Tank Outfall 3	20.005b	S216	-17.3	-0.407	-0.110	2.5925		
15 minute winter	S210	23.000	S211	22.5	0.902	0.612	2.1627		
15 minute winter	S211	23.001	S212	31.4	1.066	0.857	2.4028		
15 minute winter	S212	23.002	S215	51.1	1.011	0.367	1.3005		
15 minute winter	S213	24.000	S214	76.1	1.155	1.091	3.0000		
15 minute winter	S214	24.001	S215	118.9	1.305	1.036	3.2597		
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Eireng Consulting Engineers			File: 212039_Storm Calculations.pfd Network: Outfall 3 Jakub Matveev 01/05/2021				Page 13 Oldlands Farm Bognor	
Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.85%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S201	11	2.566	0.496	43.1	1.3918	0.0000	SURCHARGED
15 minute winter	S202	11	2.303	0.528	70.6	1.2672	0.0000	SURCHARGED
15 minute winter	S203	11	2.437	0.587	86.7	2.8154	0.0000	SURCHARGED
15 minute winter	S204	11	2.187	0.577	147.2	1.0199	0.0000	SURCHARGED
15 minute winter	S205	11	2.063	0.503	173.4	1.3631	0.0000	SURCHARGED
15 minute winter	S206	11	2.582	0.632	96.7	2.7375	0.0000	SURCHARGED
15 minute winter	S207	11	1.968	0.368	87.6	0.4163	0.0000	SURCHARGED
15 minute winter	S208	11	1.804	0.414	258.7	1.0537	0.0000	OK
600 minute winter	S209	585	1.762	0.527	27.5	1.3404	0.0000	SURCHARGED
600 minute winter	Attenuation Tank Outfall 3	585	1.762	0.597	58.3	770.8423	0.0000	SURCHARGED
15 minute winter	S210	12	3.022	0.592	42.1	1.8260	0.0000	FLOOD RISK
15 minute winter	S211	12	2.694	0.674	57.4	1.2562	0.0000	SURCHARGED
15 minute winter	S212	11	1.905	0.445	85.4	1.2816	0.0000	SURCHARGED
15 minute winter	S213	10	2.660	0.930	144.5	6.5519	4.6795	FLOOD
15 minute winter	S214	11	2.213	0.738	190.6	3.0269	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S201	20.000	S202	37.7	0.995	1.027	1.7387	
15 minute winter	S202	20.001	S204	68.7	0.975	0.983	1.5891	
15 minute winter	S203	21.000	S204	78.5	1.115	1.129	2.9400	
15 minute winter	S204	20.002	S205	146.0	1.324	1.253	1.6087	
15 minute winter	S205	20.003	S208	172.1	1.563	1.476	2.9803	
15 minute winter	S206	22.000	S207	87.6	1.245	1.255	6.1790	
15 minute winter	S207	22.001	S208	86.6	1.237	1.468	1.4283	
15 minute winter	S208	20.004	S209	259.1	1.752	0.865	2.7348	
600 minute winter	S209	20.005a	Attenuation Tank Outfall 3	27.2	1.015	0.167	4.2990	
600 minute winter	Attenuation Tank Outfall 3	20.005b	S216	-31.1	-0.453	-0.198	4.2990	
15 minute winter	S210	23.000	S211	35.1	0.995	0.956	3.2433	
15 minute winter	S211	23.001	S212	51.5	1.297	1.403	3.2432	
15 minute winter	S212	23.002	S215	85.3	1.105	0.612	2.3702	
15 minute winter	S213	24.000	S214	108.4	1.539	1.554	3.1897	
15 minute winter	S214	24.001	S215	180.9	1.640	1.576	3.9800	
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Calculated by:

Jakub Matveev

Site name:

Oldlands Farm

Site location:

Bognor

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

50.80860° N

Longitude:

0.65978° W

Reference:

1549499270

Date:

Apr 18 2021 13:57

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

6.81

Methodology

Q_{BAR} estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	3	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.37	0.37

Hydrological characteristics

	Default	Edited
SAAR (mm):	720	720
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	20.22	20.22
1 in 1 year (l/s):	17.19	17.19
1 in 30 years (l/s):	46.5	46.5
1 in 100 year (l/s):	64.5	64.5
1 in 200 years (l/s):	75.62	75.62

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

212038 Oldlands Farm, Bognor

Foul Sewerage Design Calculations

The following calculations are in accordance with British Water's 'Code of Practice Flows and Loads – 4'

From above, Flow Rate= 100 litres/employee/day (conservative estimate)

Peak Design Flow Rate = 6 x Flow Rate + 10% infiltration

Number of Employees per 8hr shift = 100 (assumed)

Number of shifts/day = 3 (assumed)

Flow Rate = $((100 \times 3) \times 100) / (3600 \times 24) = 0.347 \text{ l/s}$

Design Flow Rate = $(6 \times 0.347) \times 1.1 = \mathbf{2.67 \text{ l/s}}$

Appendix G – Drainage Maintenance

212039 Oldlands Farm, Bognor

Drainage Maintenance

It is anticipated that the maintenance schedule will generally comprise the following activities in accordance with the CIRIA publication C753 (The SuDS Manual). The items detailed below, which require inspection is not exhaustive and may be added to and amended.

Activity Indicative frequency

Typical tasks

Routine/regular maintenance (including inspections and monitoring)/every 3 months

- Inspect upstream and downstream catchpits for silt and vortex control manhole for debris. Clean out if necessary using vacuum tanker
- Litter/debris removal
- Inspection and clearance of grilles and screens
- Inspection of flow controls

Occasional maintenance/Annually

- Silt removal within manholes/catchpits/gullies
- Clean out any silt/debris/oils from channels
- Pipe drainage CCTV/check every 10 years: check manholes for evidence of silt/blockage
- Attenuation tank – CCTV/check every 10 years for silt build-up and remove via vacuum tanker
- Silt and debris removal at outfalls

Remedial maintenance/As required

- Silt removal
- Tasks to repair problems due to damage or vandalism:
- Inlet/outlet repair
- Remedial works required from CCTV survey
- Erosion repairs
- Control structure repairs
- System rehabilitation following a pollution event