

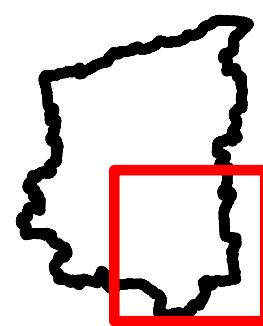
AECOM

PROJECTHorsham District Council
Level 1 Strategic Flood Risk
Assessment**CLIENT**

Horsham District Council

CONSULTANTAECOM Limited
3rd Floor Portwall Place
Portwall Lane
Bristol, United Kingdom
T +44 (0)117 315 0700**LEGEND**

- Horsham District Boundary
- Runoff Attenuation Features 1% AEP
- Runoff Attenuation Features 3.33% AEP
- Floodplain Woodland Potential
- Floodplain Reconnection Potential
- Riparian Woodland Potential
- Wider Catchment Woodland Potential

**NOTES**

1: These datasets have been produced as part of the Mapping Potential for Working with Natural Processes (WWNP) research project. The project created a toolbox of mapped data and methods which enable operational staff in England to identify potential locations. WNP involves implementing measures that help to protect, restore and emulate the natural functions of catchments, floodplains, rivers and the coast. The WNP datasets were downloaded from the DEFRA data services platform: <https://environment.data.gov.uk/>.

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

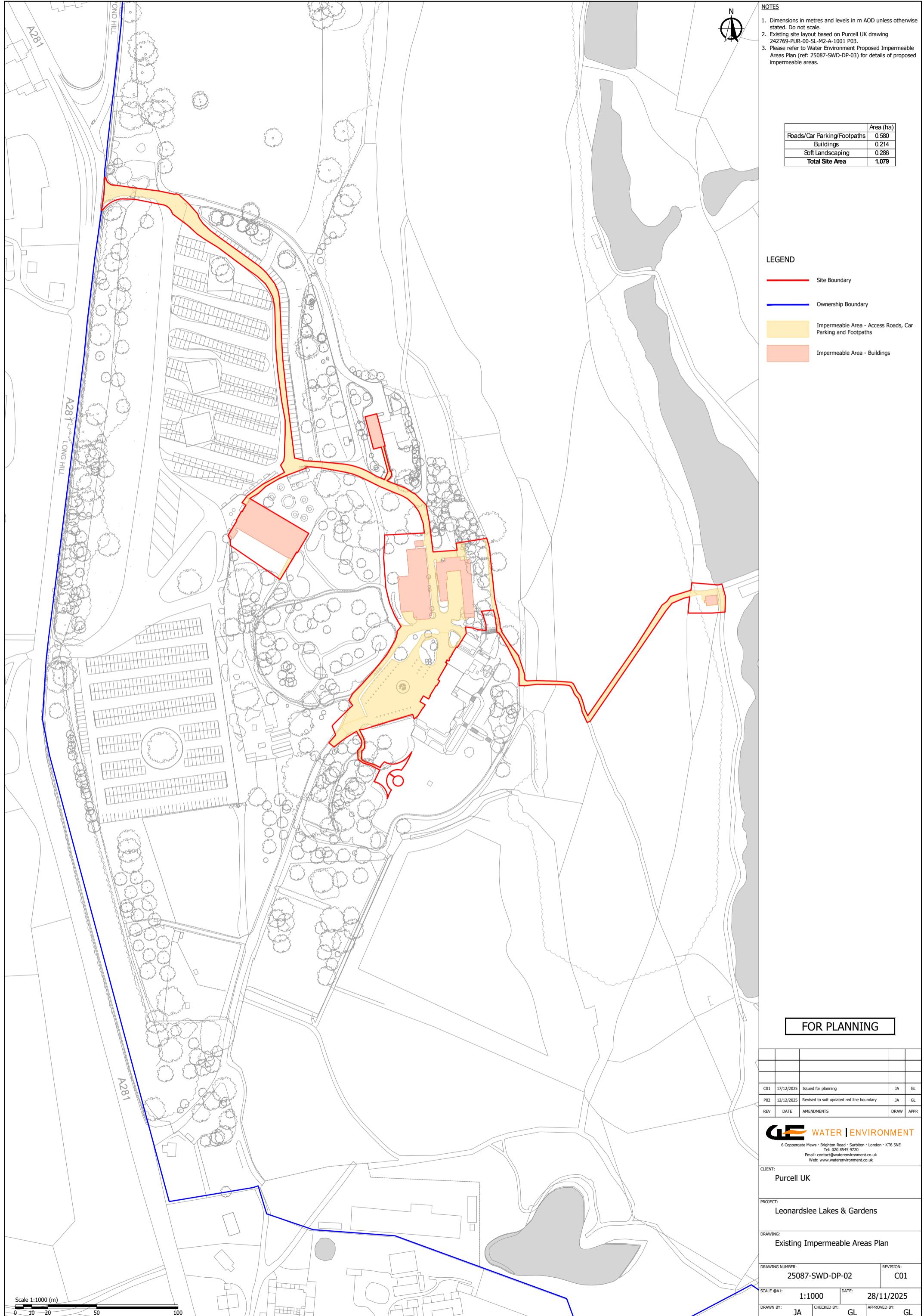
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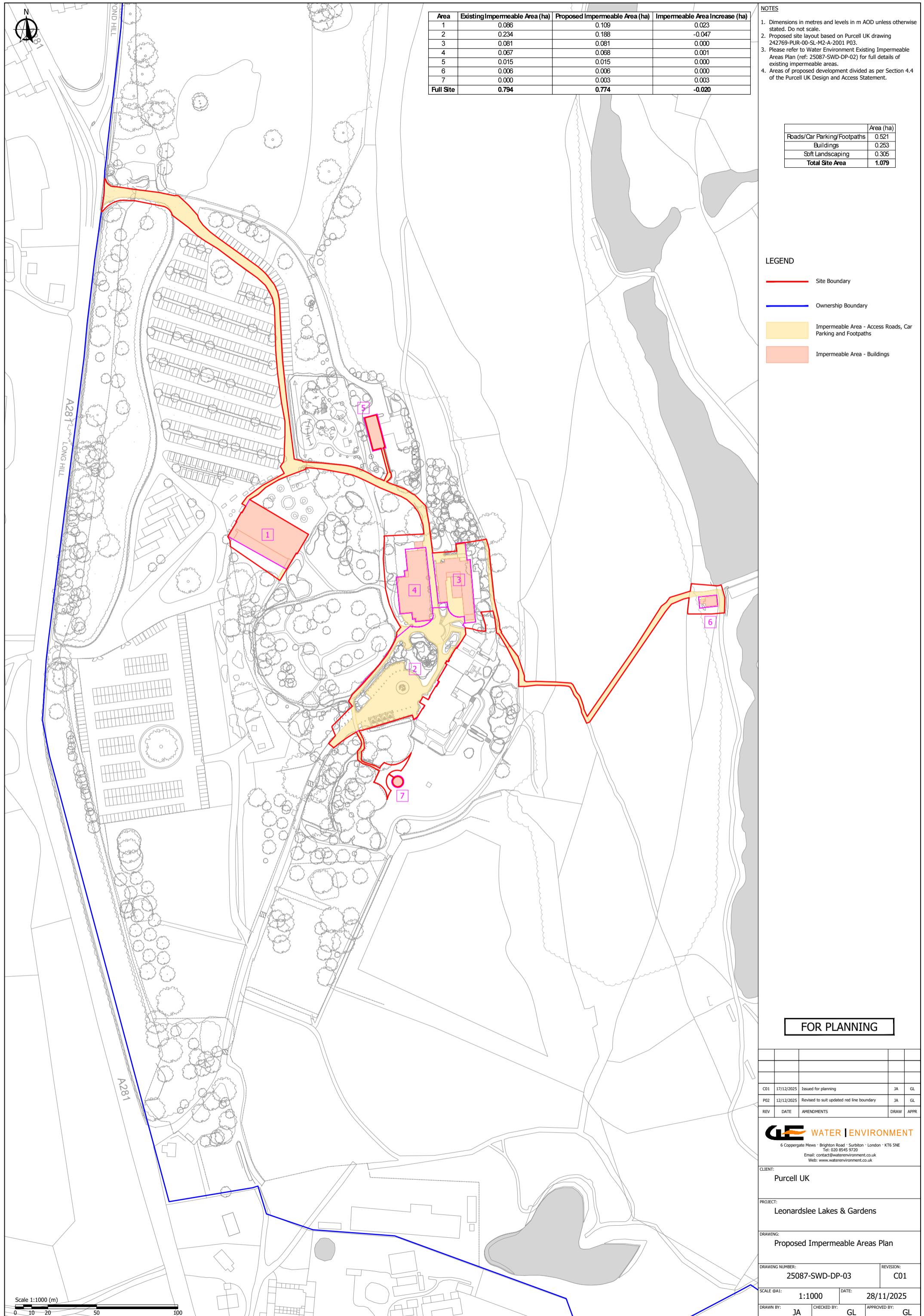
FIGURE TITLEOpportunities to Reduce the Causes
and Impacts of Flooding**FIGURE NUMBER**

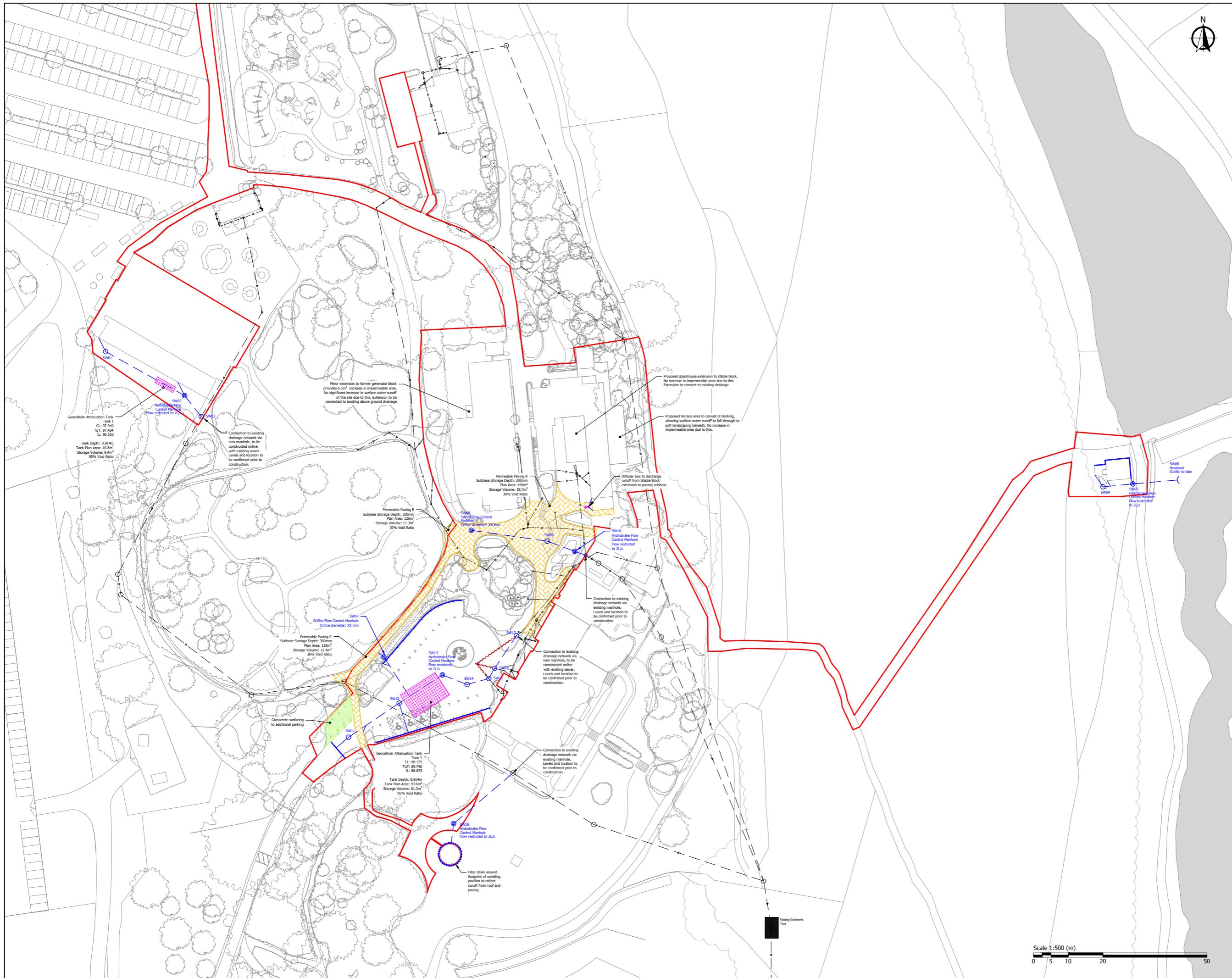
Figure A12-D

APPENDIX F: PROPOSED SURFACE WATER DRAINAGE

- F.1 Existing Impermeable Areas Plan (25087-SWD-DP-02 C01)
- F.2 Proposed Impermeable Areas Plan (25087-SWD-DP-03 C01)
- F.3 Proposed Surface Water Drainage Plan (25087-SWD-DP-01 C01)
- F.4 Proposed Surface Water Drainage Calculations (25087-SWD-MH-01-P01)
- F.5 Exceedance Flow Plan (25087-SWD-DP-04 C01)
- F.6 Horsham District Council Surface Water Drainage Statement: Pro-Forma







FOR PLANNING					
C01	17/12/2025	Issued for planning	JA	GL	
REV	DATE	AMENDMENTS	DRAW	APPR	
WATER ENVIRONMENT 6 Coppergate Mews • Brighton Road • Surbiton • London • KT6 5NE Email: contact@waterenvironment.co.uk Web: www.waterenvironment.co.uk					
CLIENT: Purcell UK					
PROJECT: Leonardslee Lakes & Gardens					
DRAWING: Proposed Surface Water Drainage Plan					
DRAWING NUMBER: 25087-SWD-DP-01			REVISION: C01		
SCALE @A1: 1:500			DATE: 12/12/2025		
DRAWN BY:	JA	CHECKED BY:	GL	APPROVED BY:	GL

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
	ExMH8 CW2		5.00	98.600	500	1.010
	SW01	0.024	5.00	97.782	1350	1.000
	SW02			97.938	1350	1.417
	SW03			97.609	1350	1.184
	ExS115			97.380	1350	1.253
	ExS114			96.290	1350	1.178

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	ExMH8 CW2	SW03	34.806	0.600	97.590	96.425	1.165	29.9	100	5.00	52.7
2.000	SW01	SW02	26.095	0.600	96.782	96.521	0.261	100.0	150	5.00	52.7
2.001	SW02	SW03	7.734	0.600	96.521	96.425	0.096	80.6	100	5.00	52.7
1.001	SW03	ExS115	8.919	0.600	96.425	96.127	0.298	29.9	100	5.00	52.7
1.002	ExS115	ExS114	42.545	0.600	96.127	95.112	1.015	41.9	100	5.00	52.7

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	1.417	11.1	0.0	0.910	1.084	0.000	0.0	0	0.000
2.000	1.005	17.8	4.6	0.850	1.267	0.024	0.0	52	0.843
2.001	0.858	6.7	4.6	1.317	1.084	0.024	0.0	61	0.922
1.001	1.415	11.1	4.6	1.084	1.153	0.024	0.0	45	1.350
1.002	1.194	9.4	4.6	1.153	1.078	0.024	0.0	50	1.190

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m ³ /ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	60	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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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 %)
2	0	0	0	100	45	0	0
30	40	0	0				

Node SW02 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	96.521	Product Number	CTL-SHE-0068-2000-0914-2000
Design Depth (m)	0.914	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SW02 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	96.521
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	47

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	10.8	0.0	0.914	10.8	0.0	0.915	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.36%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ExMH8 CW2	1	97.590	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SW01	10	96.832	0.050	4.2	0.0718	0.0000	OK
60 minute summer	SW02	39	96.631	0.110	2.9	1.2872	0.0000	SURCHARGED
60 minute summer	SW03	40	96.449	0.024	1.4	0.0349	0.0000	OK
60 minute summer	ExS115	40	96.153	0.026	1.4	0.0379	0.0000	OK
60 minute summer	ExS114	40	95.138	0.026	1.4	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link Node	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	ExMH8 CW2	1.000	SW03	0.0	0.000	0.000	0.0230	
15 minute summer	SW01	2.000	SW02	4.2	0.911	0.239	0.1939	
60 minute summer	SW02	2.001	SW03	1.4	0.763	0.210	0.0144	
60 minute summer	SW03	1.001	ExS115	1.4	0.908	0.127	0.0139	
60 minute summer	ExS115	1.002	ExS114	1.4	0.858	0.151	0.0701	2.8

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 97.36%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ExMH8 CW2	1	97.590	0.000	0.0	0.0000	0.0000	OK
60 minute summer	SW01	45	97.033	0.251	10.6	0.3595	0.0000	SURCHARGED
60 minute summer	SW02	46	97.030	0.509	9.7	5.9484	0.0000	SURCHARGED
15 minute winter	SW03	13	96.454	0.029	2.0	0.0418	0.0000	OK
120 minute summer	ExS115	116	96.159	0.032	2.0	0.0453	0.0000	OK
120 minute summer	ExS114	116	95.143	0.031	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link Node	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	ExMH8 CW2	1.000	SW03	0.0	0.000	0.000	0.0330	
60 minute summer	SW01	2.000	SW02	9.7	0.834	0.549	0.4594	
60 minute summer	SW02	2.001	SW03	2.0	0.836	0.297	0.0186	
15 minute winter	SW03	1.001	ExS115	2.0	1.042	0.180	0.0179	
120 minute summer	ExS115	1.002	ExS114	2.0	0.947	0.214	0.0900	13.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.36%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ExMH8 CW2	1	97.590	0.000	0.0	0.0000	0.0000	OK
60 minute summer	SW01	51	97.281	0.499	14.1	0.7142	0.0000	SURCHARGED
60 minute summer	SW02	52	97.278	0.757	12.7	8.8515	0.0000	SURCHARGED
15 minute summer	SW03	11	96.454	0.029	2.0	0.0418	0.0000	OK
480 minute summer	ExS115	296	96.159	0.032	2.0	0.0453	0.0000	OK
480 minute summer	ExS114	296	95.143	0.031	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link Node	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	ExMH8 CW2	1.000	SW03	0.0	0.000	0.000	0.0331	
60 minute summer	SW01	2.000	SW02	12.7	0.876	0.718	0.4594	
60 minute summer	SW02	2.001	SW03	2.0	0.836	0.297	0.0186	
15 minute summer	SW03	1.001	ExS115	2.0	1.039	0.180	0.0179	
480 minute summer	ExS115	1.002	ExS114	2.0	0.947	0.214	0.0900	24.8

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
	SW11	0.005	100.00	90.788	1350	1.350
	SW12	0.109	100.00	90.687	1350	1.425
	SW13			90.174	1350	1.350
	SW14			89.964	1350	1.350
	SW15			89.927	1350	1.377
	SW16			89.924	1350	1.408
	SW17			89.899	1350	1.464
	ExS9			89.819	100	1.439
	ExS16			89.268	100	1.288
	ExS35			89.043	100	1.333
	ExMH5 SW			88.720	1350	1.130
	SW07	0.014	5.00	91.292	1200	1.300

Links

Name	US	DS	Length	ks (mm) /	US IL	DS IL	Fall	Slope	Dia	T of C	Rain
	Node	Node	(m)	n	(m)	(m)	(m)	(1:X)	(mm)	(mins)	(mm/hr)
1.000	SW11	SW12	17.613	0.600	89.438	89.262	0.176	100.1	225	5.00	52.7
1.001	SW12	SW13	14.870	0.600	89.262	88.824	0.438	33.9	225	5.00	52.7
1.002	SW13	SW14	7.651	0.600	88.824	88.614	0.210	36.4	150	5.00	52.7
1.003	SW14	SW15	6.475	0.600	88.614	88.550	0.064	101.2	150	5.00	52.7
1.004	SW15	SW16	3.393	0.600	88.550	88.516	0.034	99.8	150	5.00	52.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth	DS Depth	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
				(m)	(m)				
1.000	1.307	52.0	1.0	1.125	1.200	0.005	0.0	22	0.512
1.001	2.253	89.6	21.7	1.200	1.125	0.114	0.0	75	1.864
1.002	1.673	29.6	24.4	1.200	1.200	0.128	0.0	104	1.864
1.003	0.999	17.6	24.4	1.200	1.227	0.128	0.0	150	1.017
1.004	1.006	17.8	24.4	1.227	1.258	0.128	0.0	150	1.025

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	SW16	SW17	11.331	0.600	88.516	88.435	0.081	139.9	150	5.00	52.7
1.006	SW17	ExS9	1.662	0.600	88.435	88.380	0.055	30.2	150	5.00	52.7
1.007	ExS9	ExS16	12.156	0.600	88.380	87.980	0.400	30.4	150	5.00	52.7
1.008	ExS16	ExS35	8.609	0.600	87.980	87.710	0.270	31.9	150	5.00	52.7
1.009	ExS35	ExMH5 SW	3.420	0.600	87.710	87.590	0.120	28.5	150	5.00	52.7
2.000	SW07	SW13	19.761	0.600	89.992	88.874	1.118	17.7	100	5.00	5.0

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	0.847	15.0	24.4	1.258	1.314	0.128	0.0	150	0.863
1.006	1.838	32.5	24.4	1.314	1.289	0.128	0.0	97	2.012
1.007	1.833	32.4	24.4	1.289	1.138	0.128	0.0	98	2.010
1.008	1.789	31.6	24.4	1.138	1.183	0.128	0.0	99	1.971
1.009	1.893	33.4	24.4	1.183	0.980	0.128	0.0	95	2.062
2.000	1.846	14.5	0.3	1.200	1.200	0.014	0.0	9	0.673

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m ³ /ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	60	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	40	0	0				

Node SW13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	88.824	Product Number	CTL-SHE-0068-2000-0914-2000
Design Depth (m)	0.914	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SW07 Online Orifice Control

Flap Valve	x	Invert Level (m)	89.992	Design Flow (l/s)	2.0	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	1.170	Diameter (m)	0.020		

Node SW13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	88.824
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth	Area	Inf Area	Depth	Area	Inf Area	Depth	Area	Inf Area
(m)	(m ²)	(m ²)	(m)	(m ²)	(m ²)	(m)	(m ²)	(m ²)
0.000	93.6	0.0	0.914	93.6	0.0	0.915	0.0	0.0

Node SW07 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	10.000	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	90.162	Length (m)	13.700	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	50	Slope (1:X)	500.0		

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW11	32	89.446	0.008	0.1	0.0108	0.0000	OK
240 minute summer	SW12	164	89.292	0.029	3.3	0.0422	0.0000	OK
360 minute summer	SW13	288	88.985	0.161	3.6	14.5242	0.0000	SURCHARGED
360 minute summer	SW14	288	88.649	0.035	1.9	0.0494	0.0000	OK
360 minute summer	SW15	296	88.586	0.036	1.9	0.0514	0.0000	OK
360 minute summer	SW16	296	88.554	0.038	1.9	0.0542	0.0000	OK
360 minute summer	SW17	296	88.463	0.028	1.9	0.0395	0.0000	OK
360 minute summer	ExS9	296	88.405	0.025	1.9	0.0002	0.0000	OK
360 minute summer	ExS16	296	88.006	0.026	1.9	0.0002	0.0000	OK
360 minute summer	ExS35	296	87.736	0.026	1.9	0.0002	0.0000	OK
360 minute summer	ExMH5 SW	296	87.614	0.024	1.9	0.0000	0.0000	OK
120 minute summer	SW07	80	90.194	0.202	1.2	0.9655	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 summer	SW11	1.000	SW12	0.1	0.100	0.002	0.0223	
240 minute summer	SW12	1.001	SW13	3.3	0.714	0.037	0.2377	
360 minute summer	SW13	Hydro-Brake®	SW14	1.9				
360 minute summer	SW14	1.003	SW15	1.9	0.604	0.108	0.0204	
360 minute summer	SW15	1.004	SW16	1.9	0.566	0.107	0.0114	
360 minute summer	SW16	1.005	SW17	1.9	0.672	0.127	0.0323	
360 minute summer	SW17	1.006	ExS9	1.9	0.919	0.059	0.0034	
360 minute summer	ExS9	1.007	ExS16	1.9	0.973	0.059	0.0237	
360 minute summer	ExS16	1.008	ExS35	1.9	0.951	0.060	0.0172	
360 minute summer	ExS35	1.009	ExMH5 SW	1.9	0.983	0.057	0.0066	27.6
120 minute summer	SW07	Orifice	SW13	0.4				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SW11	376	89.483	0.045	0.4	0.0651	0.0000	OK
360 minute winter	SW12	376	89.483	0.221	8.2	0.3169	0.0000	OK
360 minute winter	SW13	376	89.483	0.659	8.6	59.5742	0.0000	SURCHARGED
240 minute winter	SW14	156	88.650	0.036	2.0	0.0508	0.0000	OK
30 minute summer	SW15	89	88.587	0.037	2.0	0.0529	0.0000	OK
30 minute summer	SW16	89	88.555	0.039	2.0	0.0556	0.0000	OK
30 minute summer	SW17	90	88.463	0.028	2.0	0.0406	0.0000	OK
30 minute summer	ExS9	90	88.406	0.026	2.0	0.0002	0.0000	OK
30 minute summer	ExS16	90	88.006	0.026	2.0	0.0002	0.0000	OK
1440 minute summer	ExS35	780	87.737	0.027	2.0	0.0002	0.0000	OK
30 minute summer	ExMH5 SW	90	87.615	0.025	2.0	0.0000	0.0000	OK
120 minute winter	SW07	112	90.297	0.305	2.7	5.2591	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)
360 minute winter	SW11	1.000	SW12	0.4	0.129	0.008	0.3992	
360 minute winter	SW12	1.001	SW13	8.2	0.817	0.092	0.5902	
360 minute winter	SW13	Hydro-Brake®	SW14	2.0				
240 minute winter	SW14	1.003	SW15	2.0	0.612	0.113	0.0212	
30 minute summer	SW15	1.004	SW16	2.0	0.574	0.113	0.0118	
30 minute summer	SW16	1.005	SW17	2.0	0.681	0.134	0.0336	
30 minute summer	SW17	1.006	ExS9	2.0	0.931	0.062	0.0036	
30 minute summer	ExS9	1.007	ExS16	2.0	0.988	0.062	0.0247	
30 minute summer	ExS16	1.008	ExS35	2.0	0.964	0.063	0.0179	
1440 minute summer	ExS35	1.009	ExMH5 SW	2.0	0.998	0.060	0.0069	122.6
120 minute winter	SW07	Orifice	SW13	0.5				

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SW11	384	89.722	0.284	0.5	0.4058	0.0000	SURCHARGED
360 minute winter	SW12	384	89.722	0.460	10.6	0.6577	0.0000	SURCHARGED
360 minute winter	SW13	384	89.721	0.897	11.1	81.0824	0.0000	SURCHARGED
30 minute summer	SW14	67	88.650	0.036	2.0	0.0508	0.0000	OK
30 minute summer	SW15	69	88.587	0.037	2.0	0.0529	0.0000	OK
30 minute summer	SW16	69	88.555	0.039	2.0	0.0556	0.0000	OK
30 minute summer	SW17	70	88.463	0.028	2.0	0.0406	0.0000	OK
30 minute summer	ExS9	70	88.406	0.026	2.0	0.0002	0.0000	OK
600 minute summer	ExS16	315	88.006	0.026	2.0	0.0002	0.0000	OK
720 minute winter	ExS35	360	87.737	0.027	2.0	0.0002	0.0000	OK
720 minute winter	ExMH5 SW	360	87.615	0.025	2.0	0.0000	0.0000	OK
120 minute winter	SW07	116	90.350	0.358	3.6	7.4870	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)
360 minute winter	SW11	1.000	SW12	0.5	0.134	0.010	0.7005	
360 minute winter	SW12	1.001	SW13	10.6	0.850	0.118	0.5914	
360 minute winter	SW13	Hydro-Brake®	SW14	2.0				
30 minute summer	SW14	1.003	SW15	2.0	0.612	0.113	0.0212	
30 minute summer	SW15	1.004	SW16	2.0	0.574	0.113	0.0118	
30 minute summer	SW16	1.005	SW17	2.0	0.681	0.134	0.0336	
30 minute summer	SW17	1.006	ExS9	2.0	0.931	0.062	0.0036	
30 minute summer	ExS9	1.007	ExS16	2.0	0.988	0.062	0.0247	
600 minute summer	ExS16	1.008	ExS35	2.0	0.964	0.063	0.0179	
720 minute winter	ExS35	1.009	ExMH5 SW	2.0	0.998	0.060	0.0069	69.9
120 minute winter	SW07	Orifice	SW13	0.5				

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level	Diameter (mm)	Depth (m)
	SW08	0.013	5.00	90.465	1350	1.300
	SW09	0.045	5.00	89.242	1350	1.300
	SW10			88.353	1350	1.300
	ExS6			87.994	1350	1.344

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	SW08	SW09	22.120	0.600	89.165	87.942	1.223	18.1	100	5.00	52.7
1.001	SW09	SW10	8.466	0.600	87.942	87.053	0.889	9.5	100	5.00	52.7
1.002	SW10	ExS6	3.369	0.600	87.053	86.650	0.403	8.4	100	5.00	52.7

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	1.824	14.3	2.4	1.200	1.200	0.013	0.0	28	1.356
1.001	2.519	19.8	11.0	1.200	1.200	0.058	0.0	54	2.589
1.002	2.690	21.1	11.0	1.200	1.244	0.058	0.0	51	2.716

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m ³ /ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	60	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440



Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	40	0	0				

Node SW08 Online Orifice Control

Flap Valve	x	Invert Level (m)	89.165	Design Flow (l/s)	2.0	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	1.170	Diameter (m)	0.029		

Node SW09 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	87.942	Product Number	CTL-SHE-0065-2000-1170-2000
Design Depth (m)	1.170	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SW08 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	10.000	Depth (m)	0.250
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	90.085	Length (m)	12.500	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	25	Slope (1:X)	500.0		

Node SW09 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	10.000	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	88.812	Length (m)	43.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)		Slope (1:X)	500.0		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m ³)	(m ³)	
30 minute summer	SW08	21	89.504	0.339	2.0	0.4848	0.0000	SURCHARGED
120 minute summer	SW09	80	88.859	0.917	4.8	2.9961	0.0000	SURCHARGED
240 minute winter	SW10	116	87.074	0.021	1.8	0.0298	0.0000	OK
240 minute winter	ExS6	116	86.670	0.020	1.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m ³)	Vol (m ³)
30 minute summer	SW08	Orifice	SW09	1.0				
120 minute summer	SW09	Hydro-Brake®	SW10	1.8				
240 minute winter	SW10	1.002	ExS6	1.8	1.582	0.085	0.0038	13.5

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
30 minute summer	SW08	24	90.131	0.966	7.3	2.6323	0.0000	SURCHARGED
120 minute winter	SW09	116	88.999	1.057	10.4	20.1489	0.0000	FLOOD RISK
120 minute winter	SW10	116	87.075	0.022	1.9	0.0308	0.0000	OK
120 minute winter	ExS6	116	86.670	0.020	1.9	0.0000	0.0000	OK

Link Event	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
(Upstream Depth)	Node		Node	(l/s)	(m/s)		Vol (m³)	Vol (m³)
30 minute summer	SW08	Orifice	SW09	1.7				
120 minute winter	SW09	Hydro-Brake®	SW10	1.9				
120 minute winter	SW10	1.002	ExS6	1.9	1.609	0.091	0.0040	19.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
60 minute summer	SW08	43	90.166	1.001	7.4	3.9840	0.0000	FLOOD RISK
120 minute winter	SW09	120	89.070	1.128	13.3	29.3105	0.0000	FLOOD RISK
120 minute winter	SW10	120	87.075	0.022	2.0	0.0313	0.0000	OK
120 minute winter	ExS6	120	86.671	0.021	2.0	0.0000	0.0000	OK

Link Event	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
(Upstream Depth)	Node		Node	(l/s)	(m/s)		Vol (m³)	Vol (m³)
60 minute summer	SW08	Orifice	SW09	1.7				
120 minute winter	SW09	Hydro-Brake®	SW10	2.0				
120 minute winter	SW10	1.002	ExS6	2.0	1.622	0.093	0.0041	19.6

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level	Diameter (mm)	Depth (m)
	SW04	0.008	5.00	51.325	1350	1.000
	SW05			50.046	1350	1.000
	SW06			46.390	1350	0.570

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	SW04	SW05	8.668	0.600	50.325	49.046	1.279	6.8	150	5.00	52.7
1.001	SW05	SW06	12.906	0.600	49.046	45.820	3.226	4.0	100	5.00	52.7

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	3.895	68.8	1.5	0.850	0.850	0.008	0.0	16	1.597
1.001	3.894	30.6	1.5	0.900	0.470	0.008	0.0	15	2.021

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	60	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	40	0	0				

Node SW05 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	49.046	Product Number	CTL-SHE-0068-2000-0950-2000
Design Depth (m)	0.950	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m ³)	(m ³)	
15 minute summer	SW04	10	50.340	0.015	1.4	0.0212	0.0000	OK
15 minute summer	SW05	12	49.125	0.079	1.4	0.1133	0.0000	OK
15 minute summer	SW06	12	45.834	0.014	1.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
Node	Node		Node	(l/s)	(m/s)		Vol (m ³)	Vol (m ³)
15 minute summer	SW04	1.000	SW05	1.4	1.081	0.020	0.0442	
15 minute summer	SW05	1.001	SW06	1.2	1.877	0.039	0.0082	0.6

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m ³)	(m ³)	
15 minute summer	SW04	10	50.352	0.027	5.0	0.0392	0.0000	OK
30 minute summer	SW05	22	49.622	0.576	4.6	0.8238	0.0000	SURCHARGED
15 minute summer	SW06	20	45.837	0.017	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m ³)	Vol (m ³)
15 minute summer	SW04	1.000	SW05	5.0	1.244	0.072	0.0858	
30 minute summer	SW05	1.001	SW06	2.0	2.182	0.065	0.0118	2.9

CAUSEWAY 	Water Environment Ltd.	File: 25087-SWD-MH-01-P01.1 (Proposed Network) Network: Area 6 Jonathan Adams 12/12/2025	Page 5 25087 Leonardslee Lakes & Gardens Proposed SW Drainage Calculations Rev P01
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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m ³)	(m ³)	
15 minute summer	SW04	10	50.356	0.031	6.6	0.0448	0.0000	OK
30 minute summer	SW05	23	49.992	0.946	6.1	1.3532	0.0000	FLOOD RISK
15 minute winter	SW06	26	45.837	0.017	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m ³)	Vol (m ³)
15 minute summer	SW04	1.000	SW05	6.6	1.377	0.096	0.0878	
30 minute summer	SW05	1.001	SW06	2.0	2.181	0.065	0.0118	3.9

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level	Diameter (mm)	Depth (m)
	SW18	0.003	5.00	90.045	1350	1.300
	ExS110			89.780	1350	1.239
	ExS109			87.960	1350	1.342

Links

Name	US	DS	Length	ks (mm) /	US IL	DS IL	Fall	Slope	Dia	T of C	Rain
	Node	Node	(m)	n	(m)	(m)	(m)	(1:X)	(mm)	(mins)	(mm/hr)
1.000	SW18	ExS110	29.043	0.600	88.745	88.541	0.204	142.4	100	5.00	52.7
1.001	ExS110	ExS109	27.631	0.600	88.541	86.618	1.923	14.4	100	5.00	52.7

Name	Vel	Cap	Flow	US	DS	Σ Area	Σ Add Inflow	Pro Depth	Pro Velocity
	(m/s)	(l/s)	(l/s)	Depth	Depth	(ha)	(l/s)	(mm)	(m/s)
1.000	0.642	5.0	0.6	1.200	1.139	0.003	0.0	23	0.426
1.001	2.048	16.1	0.6	1.139	1.242	0.003	0.0	13	0.952

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m ³ /ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	60	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period	Climate Change	Additional Area	Additional Flow
				(years)	(CC %)	(A %)	(Q %)
2	0	0	0	100	45	0	0
30	40	0	0				

**Node SW18 Online Orifice Control**

Flap Valve	x	Replaces Downstream Link	✓	Design Depth (m)	0.950	Diameter (m)	0.048
Downstream Link	1.000	Invert Level (m)	88.745	Design Flow (l/s)	2.0	Discharge Coefficient	0.600

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
15 minute summer	SW18	11	88.780	0.035	0.5	0.0507	0.0000	OK
15 minute summer	ExS110	12	88.553	0.012	0.5	0.0169	0.0000	OK
15 minute summer	ExS109	12	86.630	0.012	0.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m³)	Vol (m³)
15 minute summer	SW18	Orifice	ExS110	0.5				
15 minute summer	ExS110	1.001	ExS109	0.5	0.902	0.029	0.0143	0.2

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

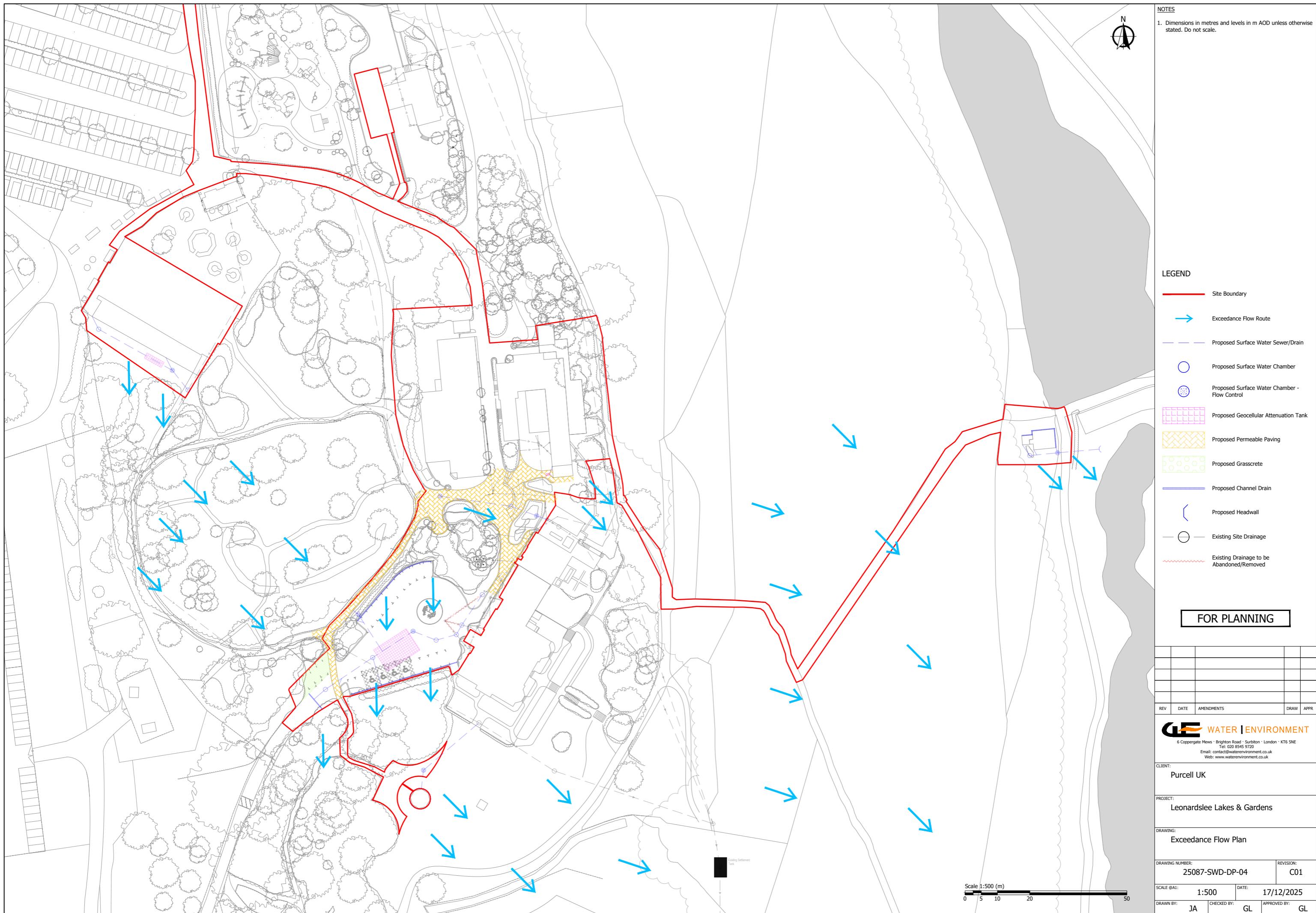
Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
15 minute summer	SW18	12	88.881	0.136	2.0	0.1947	0.0000	SURCHARGED
15 minute summer	ExS110	12	88.563	0.022	1.6	0.0309	0.0000	OK
15 minute summer	ExS109	12	86.639	0.021	1.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m³)	Vol (m³)
15 minute summer	SW18	Orifice	ExS110	1.6				
15 minute summer	ExS110	1.001	ExS109	1.6	1.303	0.100	0.0342	0.8

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood	Status
	Node	(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
15 minute summer	SW18	12	88.944	0.199	2.6	0.2845	0.0000	SURCHARGED
15 minute summer	ExS110	12	88.565	0.024	2.0	0.0346	0.0000	OK
15 minute summer	ExS109	12	86.642	0.024	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
	Node		Node	(l/s)	(m/s)		Vol (m³)	Vol (m³)
15 minute summer	SW18	Orifice	ExS110	2.0				
15 minute summer	ExS110	1.001	ExS109	2.0	1.387	0.125	0.0399	1.1





Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed development this pro-forma must be completed in full and be submitted with any planning application which seeks permission for 'major' development. This information contained in this form will be used by West Sussex County Council in its role as Lead Local Flood Authority and 'statutory consultee' on SuDS for all 'major' planning applications. The pro-forma is supported by the [Defra/EA Guidance on Rainfall Runoff Management](#) and can be completed using freely available tools including [SuDS Tools](#). The pro-forma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

1. Site Details

Site	Leonardslee Lakes & Gardens
Address & post code or LPA reference	DC/25/1146
Grid reference	522125E, 125952N
Is the existing site developed or Greenfield?	Developed
Total Site Area served by drainage system (excluding open space) (Ha)*	0.221
Topographical survey plan showing existing site layout, site levels and drainage system	MK Surveys 24451_R1. Contained in Appendix A

* The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers & Local Authorities
Impermeable area (ha) (areas to be shown on a plan)	0.794	0.774	-0.020	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed permeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)	Private sewer, discharge to watercourse	As existing	N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
Existing and proposed micro-drainage calculations	X		Appendices A & F	Please provide micro-drainage calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration		X		e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse	X		Discharge to existing private sewer network, which ultimately discharges to man-made lakes within wider estate	e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA)
To surface water sewer	X		Discharge to existing private sewer network, which ultimately discharges to man-made lakes within wider estate	Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above		X		e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.
Has the drainage proposal had regard to the SuDS hierarchy?	X		Section 5	Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Layout plan showing where the sustainable drainage infrastructure will be	X		Appendix F (25087-SWD-DP-01 P01)	Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be

located on site.			constructed and can operate independently and is not reliant on any later phase of development.
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Technical Standards S2 and S3

4. Peak Discharge Rates – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
Greenfield QBAR	4.1	N/A	N/A	Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1	38.4	32.9	-5.5	Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
1 in 30	76.5	62.8	-13.7	
1 in 100	95.4	76.4	-19.0	
1 in 100 plus climate change	N/A	76.4	N/A	To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change should be added to the peak rainfall intensity. EA Guidance - Flood Risk Assessments: Climate Change Allowances (Published Feb 2016) https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Technical Standards S4 to S9

5. Calculate discharge volumes – The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Volume (m ³)	Proposed Volume (m ³)	Difference (m ³) (Proposed-Existing)	Notes for developers & Local Authorities
1 in 1	213.1	200.5	-12.6	Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30	424.2	384.4	-139.8	
1 in 100	528.4	480.7	-47.7	
1 in 100 plus climate change	N/A	480.7	N/A	To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

Notes for developers & Local Authorities		
Storage volume required to retain discharge rates as existing (m³)	Please see Section 5 and Appendix F	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing
Where will the storage be provided on site?	Please see Section 5 and Appendix F	

7. How is Storm Water stored on site?

Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

Notes for developers & Local Authorities		
Infiltration	State the Site's Geology/drift material overlaying)	Upper Tunbridge Wells Sand – Sandstone and Mudstone
	Does the site have a high ground water table? Yes/No?	No
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?	No
	Are infiltration rates suitable?	No
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	No
	State the distance between a proposed infiltration device base and the ground water (GW) level	N/A
	Were infiltration rates obtained by desk study or infiltration test?	No
	Is infiltration feasible? Yes/No?	No

7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

Notes for developers & Local Authorities		
Please confirm what option has been chosen and how much storage is required on site.	Option 1	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Additional Consideration to comply with the Technical Standards and PPG

Notes for developers & Local Authorities		
Which Drainage Systems measures have been used?	Please see Section 5 and Appendix F	SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	Please see Section 5 and Appendix F	Safely: not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths
How are rates being restricted?	Please see Section 5 and Appendix F	Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices not be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
Drainage during construction period	Please see Section 5 and Appendix F	Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control.
Key Drainage components / Features	Please see Section 5 and Appendix F	Which component if blocked (even partial) will lead to flooding?

Technical Standards S10 to S12

9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

How is the entire drainage system to be maintained in perpetuity?	Please see Section 5	<p>Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust.</p> <p>Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed.</p> <ul style="list-style-type: none">— Specification notes that describe how work is to be undertaken and the materials to be used.— A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate.— A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the Management Plan. <p>Where open water is involved please provide a health and safety plan within the management plan.</p>
Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.	Leonardslee Lakes & Gardens	If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.
Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.	N/A	

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By...Jonathan Adams.....

Qualification of person responsible for signing off this pro-forma ...MEng.....

Company...Water Environment.....

On behalf of (Client's details) ...Leonardslee Lakes & Gardens.....

Date:...17/12/2025.....

APPENDIX G: FOUL WATER DRAINAGE

- G.1 Existing Foul Water Drainage Report – Moody Sewage Ltd
- G.2 Review of Engine House STP (PC1121-02) - Dirk Daude Wastewater Consultancy Services
- G.3 General Binding Rules Compliance Report (PC1121) - Dirk Daude Wastewater Consultancy Services



POUND HILL, POUND LANE, UCKFIELD, FRAMFIELD

EAST SUSSEX, TN22 5RR

T 01825 890294 F 01825 890498

THE SEWAGE FACILITIES AT

Leonardslee Gardens

Brighton Road

Lower Beeding

Horsham

RH13 6PP

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1) CLIENT BRIEF

- a) To carry out a survey with recommendations on the sewage facilities at Leonardslee Gardens, Brighton Road, Lower Beeding, Horsham, RH13 6PP.

2) SITE AND SYSTEM

- a) The site consists of an 200 acre estate with multiple buildings. The estate is going to be used for used for public attendance and recreation together with private functions.
- b) The existing properties producing waste are:-

- i) Main House, Stable Block and Main House annexe and Restaurant Block.**

- (1) The sewage management facilities consist of the following parts:-

- (a) A septic tank located to the south east of the estate.

- (i) The size of the tank is 3.3 metres deep with a radius of 1.0 metre.

- (ii) The volume of the tank is 10,300 litres.
- (b) A discharge pipe from the septic tank running into ground.
- (c) A final point of discharge onto ground running down the bank.

ii) Lower Lodge

- (1) The sewage management facilities consist of the following parts:-
 - (a) A Titan Biotec sewage treatment plant located to the south of the property.
 - (i) The volume of the tank is 800 litres.
 - (b) A discharge pipe from the sewage plant into the ditch.

iii) The Red House

- (1) The sewage management facilities consist of the following parts:-
 - (a) A septic tank located to the north of the property.
 - (i) The volume of the tank is estimated at 4,500 litres.
 - (b) A discharge pipe from the septic tank running into the surface water system outside the boundary of the property.
 - (c) A final point of discharge into and onto ground down the bank.

iv) Main Toilet Block

- (1) The sewage management facilities consist of the following parts:-
 - (a) A septic tank located to the south west of the toilet block, beyond the glass houses.
 - (i) The tank measures 2.5 metres diameter by 7.0 metres long.
 - (ii) The volume of the tank is estimated at 35,000 litres.
 - (b) A discharge pipe from the septic tank running into ground.

v) The Round House

- (1) The sewage management facilities consist of the following parts:-
 - (a) A septic tank located to the north east of the property.

- (i) The tank measures 0.7 metres wide by 1.7 metres long by 1.4 metres deep.
- (ii) The volume of the tank is estimated at 1,700 litres.

(b) A discharge pipe from the septic tank running into the ground.

(c) A final point of discharge likely to be onto ground in the ditch area.

c) The site is to be developed as follows:-

- i) The Main House is to be developed and will have a new kitchen and bar area. The house will be used for wedding venues. There is to be a butchery in the lower rooms.
- ii) The Main House Annexe will become a single flat.
- iii) The Stable Block is to become a 19 bedroom hotel with dining and kitchen facilities.
- iv) The Restaurant block is being refurbished.
- v) The Red House is being renovated and will become an 8 bedroom private dwelling.
- vi) The Engine House by the ponds will become a cafe.
- vii) There is a proposal to develop a winery on site.

3) FLOW AND LOADINGS

- a) It has been disclosed that the sewage make from this location is classified as domestic.
- b) Using the Moody Sewage Ltd, British Waterways and Environment Agency flow models and the information provided by the client the projected flow rates are as follows:-
 - i) **Maximum visitors to the site will be 2500 per day.**
 - (1) The following is based on one use of a W.C. per visitor. This generates:-
 - (2) 25,000 litres of sewage per day, containing:-

- (a) 30,000 grams of Biochemical Oxygen Demand (BOD) per day.
- (b) 6,250 grams Ammonia per day.

ii) The Population Equivalent flow in terms of sewage flow rate is 139.

iii) The Population Equivalent flow in terms of sewage strength is 428.

iv) Main House

- (1) The following is based on 30 covers per day and 100 high tees per day. This generates:-
- (2) 3,900 litres of sewage per day, containing:-
 - (a) 4,940 grams of Biochemical Oxygen Demand (BOD) per day.
 - (b) 520 grams Ammonia per day.

v) The Population Equivalent flow in terms of sewage flow rate is 22.

vi) The Population Equivalent flow in terms of sewage strength is 70.

vii) Main House Annexe

- (1) The following is based on 2 people in full time residency. This generates:-
- (2) 360 litres of sewage per day, containing:-
 - (a) 140 grams of Biochemical Oxygen Demand (BOD) per day.
 - (b) 16 grams Ammonia per day.

viii) The Population Equivalent flow in terms of sewage flow rate is 2.

ix) The Population Equivalent flow in terms of sewage strength is 2.

x) Stable Block

(1) The following is based on 19 hotel rooms with an average occupancy of 2 people and 300 covers per day from the restaurant. This generates:-

(2) 18,500 litres of sewage per day, containing:-

(a) 14,972 grams of Biochemical Oxygen Demand (BOD) per day.

(b) 1,580 grams Ammonia per day.

xi) The Population Equivalent flow in terms of sewage flow rate is 103.

xii) The Population Equivalent flow in terms of sewage strength is 213

xiii) Restaurant Block

(1) The following is based on a maximum of 1000 covers per day for bar snack / simple style food. This generates:-

(2) 15,000 litres of sewage per day, containing:-

(a) 19,000 grams of Biochemical Oxygen Demand (BOD) per day.

(b) 2,500 grams Ammonia per day.

xiv) The Population Equivalent flow in terms of sewage flow rate is 83.

xv) The Population Equivalent flow in terms of sewage strength is 271.

xvi) The Red House

(1) The following is based on a maximum of 12 people in full time residency. This generates:-

(2) 2,160 litres of sewage per day, containing:-

(a) 840 grams of Biochemical Oxygen Demand (BOD) per day.

(b) 96 grams Ammonia per day.

xvii) The Population Equivalent flow in terms of sewage flow rate is 12.

xviii) The Population Equivalent flow in terms of sewage strength is 12.

xix) The Round House

(1) The following is based on a maximum of 6 people in full time residency. This generates:-

(2) 1,080 litres of sewage per day, containing:-

(a) 420grams of Biochemical Oxygen Demand (BOD) per day.

(b) 48 grams Ammonia per day.

xx) The Population Equivalent flow in terms of sewage flow rate is 6.

xxi) The Population Equivalent flow in terms of sewage strength is 6.

xxii) The Winery flow rates are to be determined.

c) Surface water enters the foul sewers.

i) It is recommended that all surface water is diverted from the sewers.

d) For the purposes of any design it is recommended that the following combined flow rates are used for the Visitors, Main House, Main House Annexe, Stable Block and Restaurant Block:-

- i) 62,760 litres of sewage per day, containing:-
 - (1) 69,052 grams of Biochemical Oxygen Demand (BOD) per day.
 - (2) 10,866 grams Ammonia per day.
- ii) The Population Equivalent flow in terms of sewage flow rate is 349.
- iii) The Population Equivalent flow in terms of sewage strength is 986.

e) The Round House and The Red House flow rates will remain as projected above and kept separate at this stage.

4) ENVIRONMENTAL PERMIT AND REGULATIONS

- a) Waste water, sewage management and discharges are governed by the Environmental Permitting Regulations 2014 and are enforced by the Environment Agency.
- b) You require by Law an Environmental Permit for the discharge of sewage or treated effluent from a septic tank or sewage treatment plant.

c) There are exceptions to point 4.b as defined by the General Binding Rules for small sewage discharges, effective from 1st January 2015. This is applicable to everyone who has a septic tank or sewage treatment plant.

d) The binding rules are categorised into ground or into surface water discharges:-

i) Small sewage discharges into ground before 1st January 2015

(1) The discharge must be 2000 litres per day or less.

(2) The sewage must only be domestic.

(3) The discharge must not cause pollution to surface water or groundwater.

(4) The sewage must receive treatment from a septic tank and infiltration system (drainage field) or a sewage treatment plant and infiltration system.

(5) The discharge must not be within a groundwater Source Protection Zone 1 or within 50 metres from any well, spring or borehole that is used to supply water for domestic or food production purposes.

(6) All works and equipment used for the treatment of sewage effluent and its discharge must comply with the relevant design and manufacturing standards i.e. the British Standard that was in force at the time of the installation, and guidance issued by the appropriate authority on the capacity and installation of the equipment.

(7) The system must be installed and operated in accordance with the manufacturer's specification.

(8) Maintenance must be undertaken by someone who is competent.

(9) Waste sludge from the system must be safely disposed of by an authorised person.

(10) If a property is sold, the operator must give the new operator a written notice stating that a small sewage discharge is being carried out, and giving a description of the waste water system and its maintenance requirements.

(11) The operator must ensure the system is appropriately decommissioned where it ceases to be in operation so that there is no risk of pollutants or polluting matter entering groundwater, inland fresh waters or coastal waters.

(12) New sewage discharges into ground after 1st January 2015 are also subject to the following rules:-

(a) New discharges must not be within an acceptable distance to a foul sewer.

(b) For new discharges the operator must ensure that the necessary planning and building control approvals for systems are in place if necessary.

(c) New discharges must not be in or within 50 metres of:-

(i) A Special Area of Conservation.

(ii) Special Protection Area.

(iii) Ramsar Site.

(iv) Biological site of Special Scientific Interest.

(v) Must not be in an Ancient Woodland.

ii) Small sewage discharges into surface water before 1st January 2015

(1) The discharge must be 5000 litres per day or less.

(2) The sewage must only be domestic.

(3) The discharge must not cause pollution to surface water or groundwater.

(4) The sewage must receive treatment from a sewage treatment plant.

- (5) For discharges into tidal waters the discharge outlet must be below the mean spring low water mark.
- (6) All works and equipment used for the treatment of sewage effluent and its discharge must comply with the relevant design and manufacturing standards ie the British Standard that was in force at the time of the installation, and guidance issued by the appropriate authority on the capacity and installation of the equipment.
- (7) The system must be installed and operated in accordance with the manufacturer's specification.
- (8) Maintenance must be undertaken by someone who is competent.
- (9) Waste sludge from the system must be safely disposed of by an authorised person.
- (10) If a property is sold, the operator must give the new operator a written notice stating that a small sewage discharge is being carried out, and giving a description of the waste water system and its maintenance requirements.
- (11) The operator must ensure the system is appropriately decommissioned where it ceases to be in operation so that there is no risk of pollutants or polluting matter entering groundwater, inland fresh waters or coastal waters.

(12) New sewage discharges into surface water after 1st January 2015 are also subject to:-

- (a) New discharges must not be within an acceptable distance to a foul sewer.
- (b) For new discharges the operator must ensure that the necessary planning and building control approvals for systems are in place if necessary.
- (c) New discharges must not be in or within 500 metres of:-

- (i) A Special Area of Conservation.
- (ii) Special Protection Area.
- (iii) Ramsar Site.
- (iv) Biological site of Special Scientific Interest.
- (v) Freshwater pearl mussel population.
- (vi) Designated bathing water.
- (vii) Protected shellfish water.

- (d) New discharges must not be in or within 200 metres of an aquatic local nature reserve.
- (e) New discharges must not be in or within 50 metres of a chalk river or aquatic local wildlife site.
- (f) New discharges must be made to a watercourse that is normally has flow throughout the year.
- (g) For new discharges, any partial drainage field must be installed within 10 metres of the bank side of the watercourse.
- (h) New discharges must not be made to an enclosed lake or pond.

e) Discharges that do not meet the above requirement will require the application of an Environmental Permit.

5) CURRENT SITE STATUS

- a) There are some historical permits held for this site:-
 - i) Mr R Loder - SO/P07947/001 for a single domestic property and farm, Revoked on 20/12/2012.
 - ii) The permit was reinstated on 21/12/2012.

- (1) The discharge location for this is very near to the main toilet block tank.
- (2) The discharge appears to be into ground.
- (3) The volume of the discharge is not determined.

b) There are also active permits for the South Lodge Hotel, The Crabtree Inn and the Peppersgate Farm development.

c) The systems are in breach of the General Binding Rules and Environmental Laws due to the direct discharge of settled sewage onto land.

- i) The management of sewage in this way can be a prosecutable offence, enforced by the Environment Agency, with hefty fines if not resolved correctly.
- ii) Maximum fines are £50,000.00 with /and or custodial sentences if persistent.

d) The existing discharge points are not reusable.

6) SAMPLE HISTORY

- a) There is no sample history for this site.