

Arun District Council
Civic Centre
Maltravers Rd
Littlehampton
BN17 5LF

Our Ref: PD/243912/03
Date: 19th September 2025
BWB Contact: David Hollingsworth
Mobile: [REDACTED]
Email: [REDACTED]

Dear Sir/Madam

**PLANNING REF BE/150/22/OUT [BE/16/25/RES] – NEWLANDS ROAD, BOGNOR
REGIS P022 9NN– SURFACE WATER DRAINAGE**

This letter has been produced in response to the recent Lead Local Flood Authority (LLFA) objection letter dated 13th August 2025 and issued to Arun District Council as the latest consultation response on the above reserved matters submission. The LLFA have requested further information relating the location of surface flooding contained in the site during extreme rainfall events.

I am pleased to note the LLFA acknowledgement that the calculations submitted in our last note (reference PD/243912/03) has satisfied them that all flooding is removed in the 3.33% event and agreement to the modelling of the flood nodes as presented.

I note that the LLFA have two outstanding queries requiring further information, namely:

1. Whether the external flooding can be further reduced, and;
2. The LLFA have requested information to demonstrate that the building will not be flooded in the extreme rainfall events modelled (1% event adjusted by +45% for climate change) and that the surface flooding stays on site.

In answer to the first query we have further reviewed our proposals and incorporated a small amount of additional storage in pipe references 1.010 and 1.011. This has been achieved by upsizing 78m of previously 750mm diameter pipe to 1200mm diameter, introducing an additional 55m³ of storage into the system. This change serves to eliminate the minor flooding from manhole SW50 around the site entrance and reduces the spills from other manholes in the 100 year +45% climate change storm event.

Regarding the residual flooding in that extreme event, the additional of the extra storage and a number of other SUDS features eliminates most of the flooding except that in the low lying loading docks and a small spill from a manhole on the yard access to unit 1. We have consulted with the developer of the buildings and confirmed that the extent of external flooding proposed in the loading docks and the shallow flooding of the unit 1 yard access road is acceptable to them and is within the parameters of their development specification and within the operational expectations of building

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tenants. The flood protection standard of 100 year return period +45% climate change is for the building (not the external works) and this has been achieved. To apply this standard to external works is not considered commercially viable or desirable by the developer, so we are not proposing further attenuation storage.

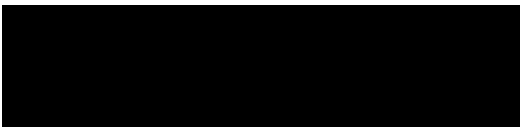
It should be noted that the flood depths and locations set out below would not prevent the operation of the building in this extreme event as lorries in the loading docks can reverse trailers into the depth of water proposed in the dock. The lorries are then rear end load from finished floor level via the dock leveller, so no one needs to access the bottom of the loading dock and the lorry tractor is up gradient from the deepest flooding in shallower water (approx. 350mm). The flooding of parking areas does not exceed 100mm depth, so these could also remain operational in this extreme event.

In answer to the second query please find enclosed updated drawing number 243912-BWB-EXT-XX-D-C-0537 Revision P03 (SUDS Overview and Masterplan Amendments). This has been updated to show the spill locations, volumes and areas of flooding that result in the 100 year+45% event. This demonstrates that all incidental flooding from manholes is contained on site within kerb heights and dock pit arrangements at acceptable depths. It also demonstrates that this flooding would drain back down to our drainage system following the storm with no water spilling out of the site.

Flood protection to the building in the 100 year +45% event is achieved with >600mm freeboard.

I trust this demonstrates that the design operates satisfactorily in the extreme design event and enables the Lead Local Flood Authority to withdraw your objection.

Yours faithfully



David Hollingsworth BEng (hons) DipWEM MSc
Director

Encl:

Hydraulic Calculation Report reference 243912-BWB-EXT-XX-M-C-0500-A4-C06

BWB Drainage Layout reference 243912-BWB-EXT-XX-D-X-0500-A4-C04

BWB SUDS Overview and Masterplan Amendments 243912-BWB-EXT-XX-D-C-0537-S2-P03

Proposed Development Discharge Rate 243912-BWB-EXT-XX-G-C-0536-S2-P02

**Design Settings**

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	x
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.080	5.00	3.376	900	494258.572	101373.022	1.176
2			3.862	900	494302.395	101383.250	1.962
3	0.021	5.00	2.830	900	494330.501	101389.806	1.160
4	0.182	5.00	2.830	900	494329.938	101429.136	1.350
5			2.975	1200	494323.972	101429.136	1.545
6			3.100	1500	494306.862	101439.388	1.840
7	0.081	5.00	3.250	1500	494292.142	101448.208	2.030
8	0.201	5.00	3.479	1500	494266.340	101447.867	2.319
9	0.086	5.00	3.400	1200	494258.481	101455.349	1.600
10			3.450	1500	494251.543	101455.258	2.250
11			3.593	1800	494239.341	101447.464	2.493
12		5.00	3.620	900	494098.649	101499.328	0.620
13	0.026	5.00	3.650	900	494099.603	101435.147	1.075
14			3.675	900	494100.533	101370.907	1.600
15	0.261	5.00	3.706	1500	494103.680	101363.570	1.911
16	0.487	5.00	3.704	1500	494124.534	101363.795	2.149
17		5.00	3.418	1200	494158.962	101354.803	2.113
18	0.254	5.00	3.700	1200	494178.252	101376.460	1.775
19			3.514	1500	494182.332	101363.615	2.259
20			3.579	1500	494220.134	101375.607	2.404
J2	0.166	5.00	2.391	1200	494184.083	101432.089	0.781
22	0.330	5.00	3.000	1500	494204.085	101432.443	1.650
23			3.126	1500	494204.244	101420.970	1.856
24			3.678	1500	494204.380	101394.589	2.478
25	0.149	5.00	3.492	1200	494154.037	101349.088	1.734
26	0.066	5.00	3.519	900	494192.894	101378.147	1.069
27	0.019	5.00	3.340	1200	494197.388	101359.599	1.925
28	0.081	5.00	3.256	1200	494220.559	101365.203	1.946
29			3.235	1200	494226.507	101366.646	1.995
30	0.023	5.00	3.623	1500	494225.866	101383.980	2.503
31			3.451	1800	494233.398	101386.902	2.391
32	0.101	5.00	3.456	1800	494232.839	101447.511	2.526
33	0.060	5.00	3.456	1800	494232.393	101477.837	2.596
34	0.043	5.00	3.230	1800	494230.095	101517.661	2.450
35	0.013	5.00	3.634	900	494097.702	101564.737	1.064
36	0.140	5.00	3.699	1500	494100.770	101572.123	1.564
37	0.392	5.00	3.699	1500	494140.283	101572.672	1.849
38			3.707	1500	494173.595	101573.140	1.947
39		5.00	3.517	1500	494163.985	101582.507	2.627
40			3.499	1500	494175.985	101576.646	2.629
41	0.005	5.00	3.415	1500	494204.285	101557.358	2.615
J1	0.048	5.00	2.391	1200	494182.883	101517.961	0.786

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
43	0.177	5.00	3.000	1200	494201.716	101521.011	1.605
44			3.150	1200	494201.549	101531.374	1.835
45	0.147	5.00	3.522	900	494158.278	101587.058	1.522
46			3.275	900	494185.655	101574.790	1.785
47	0.057	5.00	3.371	1200	494200.191	101564.150	2.181
48			3.370	1200	494204.850	101560.596	2.250
49	0.022	5.00	3.348	1800	494213.587	101555.791	2.568
50	0.004	5.00	3.341	1800	494226.874	101555.916	2.641
ExMH2	0.197	5.00	2.860	1800	494226.798	101573.518	2.220
ExMH1	0.062	5.00	3.580	1200	494150.911	101606.609	1.300
ExMH3			2.680	1800	494245.463	101578.840	2.040
ExMH4	0.084	5.00	2.710	1800	494277.278	101609.015	2.200
ExMH5	0.122	5.00	2.370	1800	494340.155	101673.616	1.910
ExMH6	0.129	5.00	2.430	1800	494379.221	101715.415	2.260
Outfall			2.440		494378.469	101722.864	2.290

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)
S3.000	12	13	64.188	0.600	3.000	2.575	0.425	151.0	150	6.31	50.0
S3.001	13	14	64.247	0.600	2.575	2.150	0.425	151.2	150	7.63	50.0
S3.002	14	15	7.983	0.600	2.075	2.020	0.055	145.1	225	7.75	50.0
S3.003	15	16	20.855	0.600	1.795	1.705	0.090	231.7	450	8.01	50.0
S3.004	16	19	57.798	0.600	1.555	1.255	0.300	192.7	600	8.56	50.0
S4.000	17	19	24.976	0.600	1.305	1.255	0.050	499.5	600	5.38	50.0
S5.000	18	19	13.477	0.600	1.925	1.555	0.370	36.4	300	5.09	50.0
S3.005	19	20	39.659	0.600	1.255	1.175	0.080	495.7	600	9.17	50.0
S3.006	20	30	10.147	0.600	1.175	1.120	0.055	184.5	600	9.26	50.0
S6.000	25	27	44.607	0.600	1.758	1.490	0.268	166.4	225	5.74	50.0
S7.000	26	27	19.085	0.600	2.450	1.565	0.885	21.6	150	5.15	50.0
S6.001	27	28	23.839	0.600	1.415	1.310	0.105	227.0	300	6.12	50.0
S6.002	28	29	6.121	0.600	1.310	1.240	0.070	87.4	300	6.18	50.0
S6.003	29	30	17.346	0.600	1.240	1.120	0.120	144.6	300	6.40	50.0

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)
S3.000	0.815	14.4	0.0	0.470	0.925	0.000	0.0	0	0.000
S3.001	0.815	14.4	4.7	0.925	1.375	0.026	0.0	59	0.729
S3.002	1.083	43.1	4.7	1.375	1.461	0.026	0.0	50	0.712
S3.003	1.331	211.7	51.8	1.461	1.549	0.287	0.0	151	1.107
S3.004	1.751	495.0	139.8	1.549	1.659	0.774	0.0	217	1.515
S4.000	1.082	306.1	0.0	1.513	1.659	0.000	0.0	0	0.000
S5.000	2.613	184.7	46.0	1.475	1.659	0.254	0.0	102	2.183
S3.005	1.087	307.2	185.7	1.659	1.804	1.028	0.0	337	1.136
S3.006	1.789	505.9	185.7	1.804	1.903	1.028	0.0	251	1.658
S6.000	1.010	40.2	26.8	1.509	1.625	0.149	0.0	135	1.081
S7.000	2.178	38.5	11.9	0.919	1.625	0.066	0.0	57	1.923
S6.001	1.039	73.4	42.3	1.625	1.646	0.234	0.0	163	1.074
S6.002	1.682	118.9	56.9	1.646	1.695	0.315	0.0	146	1.664
S6.003	1.305	92.3	56.9	1.695	2.203	0.315	0.0	171	1.371

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)
S8.000A	J2	22	20.005	0.600	1.610	1.515	0.095	210.6	300	5.31	37.3
S8.000	22	23	11.400	0.600	1.350	1.270	0.080	142.5	450	5.42	50.0
S8.001	23	24	26.307	0.600	1.270	1.200	0.070	375.8	450	5.84	50.0
S8.002	24	30	23.995	0.600	1.200	1.120	0.080	299.9	450	6.18	50.0
S3.007	30	31	8.079	0.600	1.120	1.060	0.060	134.7	225	9.38	50.0
S3.008	31	32	60.612	0.600	1.060	0.930	0.130	466.2	750	10.17	50.0
S1.000	1	2	45.001	0.600	2.200	1.900	0.300	150.0	225	5.70	50.0
S1.001	2	3	28.860	0.600	1.900	1.670	0.230	125.5	225	6.12	50.0
S1.002	3	4	39.334	0.600	1.670	1.480	0.190	207.0	300	6.72	50.0
S1.003	4	5	5.966	0.600	1.480	1.430	0.050	119.3	300	6.79	50.0
S1.004	5	6	19.946	0.600	1.430	1.370	0.060	332.4	450	7.09	50.0
S1.005	6	7	17.160	0.600	1.260	1.220	0.040	429.0	600	7.33	50.0
S1.006	7	8	25.804	0.600	1.220	1.160	0.060	430.1	600	7.70	50.0
S1.007	8	11	27.002	0.600	1.160	1.100	0.060	450.0	600	8.10	50.0
S2.000	9	10	6.939	0.600	1.800	1.425	0.375	18.5	225	5.04	50.0
S2.001	10	11	14.479	0.600	1.200	1.100	0.100	144.8	450	5.18	50.0
S1.008	11	32	6.502	0.600	1.100	1.080	0.020	325.1	600	8.18	50.0
S1.009	32	33	30.329	0.600	0.930	0.860	0.070	433.3	750	10.54	50.0
S1.010	33	34	39.890	0.600	0.860	0.780	0.080	498.6	1200	10.94	50.0
S1.011	34	50	38.390	0.600	0.780	0.700	0.080	479.9	1200	11.32	50.0
S9.000	12	35	65.416	0.600	3.000	2.570	0.430	152.1	150	6.34	50.0
S9.001	35	36	8.046	0.600	2.570	2.510	0.060	134.1	150	6.50	50.0
S9.002	36	37	39.517	0.600	2.135	2.000	0.135	292.7	450	7.05	50.0
S9.003	37	38	33.315	0.600	1.850	1.760	0.090	370.2	600	7.49	50.0

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)
S8.000A	1.079	76.3	22.4	0.481	1.185	0.166	0.0	111	0.941
S8.000	1.701	270.5	89.6	1.200	1.406	0.496	0.0	178	1.534
S8.001	1.042	165.8	89.6	1.406	2.028	0.496	0.0	236	1.062
S8.002	1.168	185.8	89.6	2.028	2.053	0.496	0.0	220	1.158
S3.007	1.125	44.7	336.4	2.278	2.166	1.862	0.0	225	1.146
S3.008	1.289	569.5	336.4	1.641	1.776	1.862	0.0	416	1.340
S1.000	1.065	42.3	14.4	0.951	1.737	0.080	0.0	90	0.964
S1.001	1.166	46.3	14.4	1.737	0.935	0.080	0.0	86	1.030
S1.002	1.089	77.0	18.2	0.860	1.050	0.101	0.0	99	0.897
S1.003	1.438	101.6	51.1	1.050	1.245	0.283	0.0	150	1.439
S1.004	1.109	176.4	51.1	1.095	1.280	0.283	0.0	166	0.966
S1.005	1.169	330.5	51.1	1.240	1.430	0.283	0.0	158	0.857
S1.006	1.168	330.1	65.8	1.430	1.719	0.364	0.0	180	0.919
S1.007	1.141	322.6	102.1	1.719	1.893	0.565	0.0	231	1.017
S2.000	3.056	121.5	15.5	1.375	1.800	0.086	0.0	54	2.116
S2.001	1.687	268.3	15.5	1.800	2.043	0.086	0.0	73	0.933
S1.008	1.345	380.2	117.6	1.893	1.776	0.651	0.0	228	1.192
S1.009	1.338	591.0	472.3	1.776	1.846	2.614	0.0	509	1.477
S1.010	1.668	1886.7	483.2	1.396	1.250	2.674	0.0	412	1.410
S1.011	1.701	1923.5	491.0	1.250	1.441	2.717	0.0	410	1.435
S9.000	0.812	14.4	0.0	0.470	0.914	0.000	0.0	0	0.000
S9.001	0.866	15.3	2.4	0.914	1.039	0.013	0.0	40	0.632
S9.002	1.183	188.1	27.6	1.114	1.249	0.153	0.0	116	0.854
S9.003	1.259	356.1	98.4	1.249	1.347	0.545	0.0	215	1.084

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)
S9.004	38	40	4.243	0.600	1.760	0.870	0.890	4.8	600	7.50	50.0
S10.000	39	40	13.355	0.600	0.890	0.870	0.020	667.7	600	5.24	50.0
S9.005	40	41	34.248	0.600	0.870	0.800	0.070	489.3	600	8.02	50.0
S9.006	41	49	9.433	0.600	0.800	0.780	0.020	471.7	600	8.16	50.0
S12.000	45	46	30.000	0.600	2.000	1.490	0.510	58.8	225	5.29	50.0
S12.001	46	47	18.014	0.600	1.490	1.190	0.300	60.0	225	5.47	50.0
S12.002	47	48	5.860	0.600	1.190	1.120	0.070	83.7	225	5.54	50.0
S12.003	48	49	9.971	0.600	1.120	1.080	0.040	249.3	300	5.71	50.0
S11.000A	J1	43	19.078	0.600	1.605	1.470	0.135	141.3	225	5.29	37.3
S11.000	43	44	10.364	0.600	1.395	1.315	0.080	129.6	300	5.41	50.0
S11.001	44	49	27.223	0.600	1.315	1.080	0.235	115.8	300	5.73	50.0
S9.007	49	50	13.288	0.600	0.780	0.700	0.080	166.1	225	8.38	50.0
S1.012	50	ExMH2	17.602	0.600	0.700	0.640	0.060	293.4	450	11.57	50.0
Ex 1	ExMH1	ExMH2	82.788	0.600	2.280	0.670	1.610	51.4	225	5.75	36.1
Ex 2	ExMH2	ExMH3	19.409	0.600	0.670	0.640	0.030	647.0	750	11.86	24.8
Ex 3	ExMH3	ExMH4	43.849	0.600	0.640	0.510	0.130	337.3	750	12.35	23.7
Ex 4	ExMH4	ExMH5	90.103	0.600	0.510	0.460	0.050	1802.1	750	14.66	21.7
Ex 5	ExMH5	ExMH6	57.213	0.600	0.460	0.170	0.290	197.3	750	15.14	20.9
Ex 6	ExMH6	Outfall	7.487	0.600	0.170	0.150	0.020	374.4	225	15.32	21.5

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)
S9.004	11.199	3166.3	98.4	1.347	2.029	0.545	0.0	71	5.213
S10.000	0.935	264.3	0.0	2.027	2.029	0.000	0.0	0	0.000
S9.005	1.094	309.3	98.4	2.029	2.015	0.545	0.0	232	0.976
S9.006	1.114	315.1	99.4	2.015	1.968	0.550	0.0	231	0.992
S12.000	1.708	67.9	26.5	1.297	1.560	0.147	0.0	98	1.609
S12.001	1.691	67.2	26.5	1.560	1.956	0.147	0.0	98	1.592
S12.002	1.430	56.9	36.9	1.956	2.025	0.204	0.0	132	1.519
S12.003	0.991	70.1	36.9	1.950	1.968	0.204	0.0	155	1.004
S11.000A	1.098	43.6	6.5	0.561	1.305	0.048	0.0	58	0.792
S11.000	1.380	97.5	40.7	1.305	1.535	0.225	0.0	135	1.319
S11.001	1.460	103.2	40.7	1.535	1.968	0.225	0.0	131	1.377
S9.007	1.011	40.2	180.9	2.343	2.416	1.001	0.0	225	1.030
S1.012	1.182	187.9	672.6	2.191	1.770	3.722	0.0	450	1.197
Ex 1	1.828	72.7	8.1	1.075	1.965	0.062	0.0	51	1.216
Ex 2	1.092	482.6	356.9	1.440	1.290	3.982	0.0	482	1.190
Ex 3	1.518	670.5	341.0	1.290	1.450	3.982	0.0	379	1.524
Ex 4	0.650	287.1	318.9	1.450	1.160	4.066	0.0	750	0.656
Ex 5	1.988	878.5	316.3	1.160	1.510	4.187	0.0	310	1.834
Ex 6	0.670	26.6	335.4	2.035	2.065	4.317	0.0	225	0.682

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)
S3.000	64.188	151.0	150	Circular	3.620	3.000	0.470	3.650	2.575	0.925
S3.001	64.247	151.2	150	Circular	3.650	2.575	0.925	3.675	2.150	1.375
S3.002	7.983	145.1	225	Circular	3.675	2.075	1.375	3.706	2.020	1.461
S3.003	20.855	231.7	450	Circular	3.706	1.795	1.461	3.704	1.705	1.549
S3.004	57.798	192.7	600	Circular	3.704	1.555	1.549	3.514	1.255	1.659
S4.000	24.976	499.5	600	Circular	3.418	1.305	1.513	3.514	1.255	1.659
S5.000	13.477	36.4	300	Circular	3.700	1.925	1.475	3.514	1.555	1.659
S3.005	39.659	495.7	600	Circular	3.514	1.255	1.659	3.579	1.175	1.804
S3.006	10.147	184.5	600	Circular	3.579	1.175	1.804	3.623	1.120	1.903
S6.000	44.607	166.4	225	Circular	3.492	1.758	1.509	3.340	1.490	1.625
S7.000	19.085	21.6	150	Circular	3.519	2.450	0.919	3.340	1.565	1.625
S6.001	23.839	227.0	300	Circular	3.340	1.415	1.625	3.256	1.310	1.646
S6.002	6.121	87.4	300	Circular	3.256	1.310	1.646	3.235	1.240	1.695
S6.003	17.346	144.6	300	Circular	3.235	1.240	1.695	3.623	1.120	2.203
S8.000A	20.005	210.6	300	Circular	2.391	1.610	0.481	3.000	1.515	1.185
S8.000	11.400	142.5	450	Circular	3.000	1.350	1.200	3.126	1.270	1.406
S8.001	26.307	375.8	450	Circular	3.126	1.270	1.406	3.678	1.200	2.028
S8.002	23.995	299.9	450	Circular	3.678	1.200	2.028	3.623	1.120	2.053
S3.007	8.079	134.7	225	Circular	3.623	1.120	2.278	3.451	1.060	2.166
S3.008	60.612	466.2	750	Circular	3.451	1.060	1.641	3.456	0.930	1.776
S1.000	45.001	150.0	225	Circular	3.376	2.200	0.951	3.862	1.900	1.737
S1.001	28.860	125.5	225	Circular	3.862	1.900	1.737	2.830	1.670	0.935
S1.002	39.334	207.0	300	Circular	2.830	1.670	0.860	2.830	1.480	1.050
S1.003	5.966	119.3	300	Circular	2.830	1.480	1.050	2.975	1.430	1.245
S1.004	19.946	332.4	450	Circular	2.975	1.430	1.095	3.100	1.370	1.280

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S3.000	12	900	Manhole	Adoptable	13	900	Manhole	Adoptable
S3.001	13	900	Manhole	Adoptable	14	900	Manhole	Adoptable
S3.002	14	900	Manhole	Adoptable	15	1500	Manhole	Adoptable
S3.003	15	1500	Manhole	Adoptable	16	1500	Manhole	Adoptable
S3.004	16	1500	Manhole	Adoptable	19	1500	Manhole	Adoptable
S4.000	17	1200	Manhole	Adoptable	19	1500	Manhole	Adoptable
S5.000	18	1200	Manhole	Adoptable	19	1500	Manhole	Adoptable
S3.005	19	1500	Manhole	Adoptable	20	1500	Manhole	Adoptable
S3.006	20	1500	Manhole	Adoptable	30	1500	Manhole	Adoptable
S6.000	25	1200	Manhole	Adoptable	27	1200	Manhole	Adoptable
S7.000	26	900	Manhole	Adoptable	27	1200	Manhole	Adoptable
S6.001	27	1200	Manhole	Adoptable	28	1200	Manhole	Adoptable
S6.002	28	1200	Manhole	Adoptable	29	1200	Manhole	Adoptable
S6.003	29	1200	Manhole	Adoptable	30	1500	Manhole	Adoptable
S8.000A	J2	1200	Manhole	Adoptable	22	1500	Manhole	Adoptable
S8.000	22	1500	Manhole	Adoptable	23	1500	Manhole	Adoptable
S8.001	23	1500	Manhole	Adoptable	24	1500	Manhole	Adoptable
S8.002	24	1500	Manhole	Adoptable	30	1500	Manhole	Adoptable
S3.007	30	1500	Manhole	Adoptable	31	1800	Manhole	Adoptable
S3.008	31	1800	Manhole	Adoptable	32	1800	Manhole	Adoptable
S1.000	1	900	Manhole	Adoptable	2	900	Manhole	Adoptable
S1.001	2	900	Manhole	Adoptable	3	900	Manhole	Adoptable
S1.002	3	900	Manhole	Adoptable	4	900	Manhole	Adoptable
S1.003	4	900	Manhole	Adoptable	5	1200	Manhole	Adoptable
S1.004	5	1200	Manhole	Adoptable	6	1500	Manhole	Adoptable

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)
S1.005	17.160	429.0	600	Circular	3.100	1.260	1.240	3.250	1.220	1.430
S1.006	25.804	430.1	600	Circular	3.250	1.220	1.430	3.479	1.160	1.719
S1.007	27.002	450.0	600	Circular	3.479	1.160	1.719	3.593	1.100	1.893
S2.000	6.939	18.5	225	Circular	3.400	1.800	1.375	3.450	1.425	1.800
S2.001	14.479	144.8	450	Circular	3.450	1.200	1.800	3.593	1.100	2.043
S1.008	6.502	325.1	600	Circular	3.593	1.100	1.893	3.456	1.080	1.776
S1.009	30.329	433.3	750	Circular	3.456	0.930	1.776	3.456	0.860	1.846
S1.010	39.890	498.6	1200	Circular	3.456	0.860	1.396	3.230	0.780	1.250
S1.011	38.390	479.9	1200	Circular	3.230	0.780	1.250	3.341	0.700	1.441
S9.000	65.416	152.1	150	Circular	3.620	3.000	0.470	3.634	2.570	0.914
S9.001	8.046	134.1	150	Circular	3.634	2.570	0.914	3.699	2.510	1.039
S9.002	39.517	292.7	450	Circular	3.699	2.135	1.114	3.699	2.000	1.249
S9.003	33.315	370.2	600	Circular	3.699	1.850	1.249	3.707	1.760	1.347
S9.004	4.243	4.8	600	Circular	3.707	1.760	1.347	3.499	0.870	2.029
S10.000	13.355	667.7	600	Circular	3.517	0.890	2.027	3.499	0.870	2.029
S9.005	34.248	489.3	600	Circular	3.499	0.870	2.029	3.415	0.800	2.015
S9.006	9.433	471.7	600	Circular	3.415	0.800	2.015	3.348	0.780	1.968
S12.000	30.000	58.8	225	Circular	3.522	2.000	1.297	3.275	1.490	1.560
S12.001	18.014	60.0	225	Circular	3.275	1.490	1.560	3.371	1.190	1.956
S12.002	5.860	83.7	225	Circular	3.371	1.190	1.956	3.370	1.120	2.025
S12.003	9.971	249.3	300	Circular	3.370	1.120	1.950	3.348	1.080	1.968
S11.000A	19.078	141.3	225	Circular	2.391	1.605	0.561	3.000	1.470	1.305
S11.000	10.364	129.6	300	Circular	3.000	1.395	1.305	3.150	1.315	1.535
S11.001	27.223	115.8	300	Circular	3.150	1.315	1.535	3.348	1.080	1.968
S9.007	13.288	166.1	225	Circular	3.348	0.780	2.343	3.341	0.700	2.416

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.005	6	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable
S1.006	7	1500	Manhole	Adoptable	8	1500	Manhole	Adoptable
S1.007	8	1500	Manhole	Adoptable	11	1800	Manhole	Adoptable
S2.000	9	1200	Manhole	Adoptable	10	1500	Manhole	Adoptable
S2.001	10	1500	Manhole	Adoptable	11	1800	Manhole	Adoptable
S1.008	11	1800	Manhole	Adoptable	32	1800	Manhole	Adoptable
S1.009	32	1800	Manhole	Adoptable	33	1800	Manhole	Adoptable
S1.010	33	1800	Manhole	Adoptable	34	1800	Manhole	Adoptable
S1.011	34	1800	Manhole	Adoptable	50	1800	Manhole	Adoptable
S9.000	12	900	Manhole	Adoptable	35	900	Manhole	Adoptable
S9.001	35	900	Manhole	Adoptable	36	1500	Manhole	Adoptable
S9.002	36	1500	Manhole	Adoptable	37	1500	Manhole	Adoptable
S9.003	37	1500	Manhole	Adoptable	38	1500	Manhole	Adoptable
S9.004	38	1500	Manhole	Adoptable	40	1500	Manhole	Adoptable
S10.000	39	1500	Manhole	Adoptable	40	1500	Manhole	Adoptable
S9.005	40	1500	Manhole	Adoptable	41	1500	Manhole	Adoptable
S9.006	41	1500	Manhole	Adoptable	49	1800	Manhole	Adoptable
S12.000	45	900	Manhole	Adoptable	46	900	Manhole	Adoptable
S12.001	46	900	Manhole	Adoptable	47	1200	Manhole	Adoptable
S12.002	47	1200	Manhole	Adoptable	48	1200	Manhole	Adoptable
S12.003	48	1200	Manhole	Adoptable	49	1800	Manhole	Adoptable
S11.000A	J1	1200	Manhole	Adoptable	43	1200	Manhole	Adoptable
S11.000	43	1200	Manhole	Adoptable	44	1200	Manhole	Adoptable
S11.001	44	1200	Manhole	Adoptable	49	1800	Manhole	Adoptable
S9.007	49	1800	Manhole	Adoptable	50	1800	Manhole	Adoptable

Pipeline Schedule

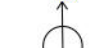
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S1.012	17.602	293.4	450	Circular	3.341	0.700	2.191	2.860	0.640	1.770
Ex 1	82.788	51.4	225	Circular	3.580	2.280	1.075	2.860	0.670	1.965
Ex 2	19.409	647.0	750	Circular	2.860	0.670	1.440	2.680	0.640	1.290
Ex 3	43.849	337.3	750	Circular	2.680	0.640	1.290	2.710	0.510	1.450
Ex 4	90.103	1802.1	750	Circular	2.710	0.510	1.450	2.370	0.460	1.160
Ex 5	57.213	197.3	750	Circular	2.370	0.460	1.160	2.430	0.170	1.510
Ex 6	7.487	374.4	225	Circular	2.430	0.170	2.035	2.440	0.150	2.065

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.012	50	1800	Manhole	Adoptable	ExMH2	1800	Manhole	Adoptable
Ex 1	ExMH1	1200	Manhole	Adoptable	ExMH2	1800	Manhole	Adoptable
Ex 2	ExMH2	1800	Manhole	Adoptable	ExMH3	1800	Manhole	Adoptable
Ex 3	ExMH3	1800	Manhole	Adoptable	ExMH4	1800	Manhole	Adoptable
Ex 4	ExMH4	1800	Manhole	Adoptable	ExMH5	1800	Manhole	Adoptable
Ex 5	ExMH5	1800	Manhole	Adoptable	ExMH6	1800	Manhole	Adoptable
Ex 6	ExMH6	1800	Manhole	Adoptable	Outfall		Junction	

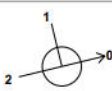
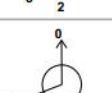
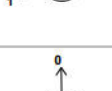
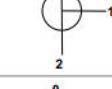
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	494258.572	101373.022	3.376	1.176	900				
						0	S1.000	2.200	225
2	494302.395	101383.250	3.862	1.962	900		1	S1.000	1.900
						0	S1.001	1.900	225
3	494330.501	101389.806	2.830	1.160	900		1	S1.001	1.670
						0	S1.002	1.670	300
4	494329.938	101429.136	2.830	1.350	900		1	S1.002	1.480
						0	S1.003	1.480	300
5	494323.972	101429.136	2.975	1.545	1200		1	S1.003	1.430
						0	S1.004	1.430	450
6	494306.862	101439.388	3.100	1.840	1500		1	S1.004	1.370
						0	S1.005	1.260	600
7	494292.142	101448.208	3.250	2.030	1500		1	S1.005	1.220
						0	S1.006	1.220	600

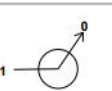
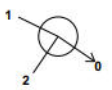
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
8	494266.340	101447.867	3.479	2.319	1500		1	S1.006	1.160	600
							0	S1.007	1.160	600
9	494258.481	101455.349	3.400	1.600	1200					
							0	S2.000	1.800	225
10	494251.543	101455.258	3.450	2.250	1500		1	S2.000	1.425	225
							0	S2.001	1.200	450
11	494239.341	101447.464	3.593	2.493	1800		1	S2.001	1.100	450
							2	S1.007	1.100	600
							0	S1.008	1.100	600
12	494098.649	101499.328	3.620	0.620	900		0-1	S3.000	3.000	150
							0-2	S9.000	3.000	150
13	494099.603	101435.147	3.650	1.075	900		1	S3.000	2.575	150
							0	S3.001	2.575	150
14	494100.533	101370.907	3.675	1.600	900		1	S3.001	2.150	150
							0	S3.002	2.075	225
15	494103.680	101363.570	3.706	1.911	1500		1	S3.002	2.020	225
							0	S3.003	1.795	450
16	494124.534	101363.795	3.704	2.149	1500		1	S3.003	1.705	450
							0	S3.004	1.555	600
17	494158.962	101354.803	3.418	2.113	1200					
							0	S4.000	1.305	600
18	494178.252	101376.460	3.700	1.775	1200					
							0	S5.000	1.925	300
19	494182.332	101363.615	3.514	2.259	1500		1	S5.000	1.555	300
							2	S4.000	1.255	600
							3	S3.004	1.255	600
							0	S3.005	1.255	600
20	494220.134	101375.607	3.579	2.404	1500		1	S3.005	1.175	600
							0	S3.006	1.175	600

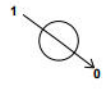
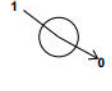
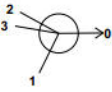
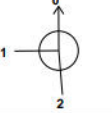
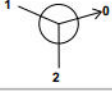
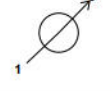
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
J2	494184.083	101432.089	2.391	0.781	1200		0	S8.000A	1.610	300
22	494204.085	101432.443	3.000	1.650	1500		1	S8.000A	1.515	300
23	494204.244	101420.970	3.126	1.856	1500		0	S8.000	1.350	450
24	494204.380	101394.589	3.678	2.478	1500		1	S8.001	1.270	450
25	494154.037	101349.088	3.492	1.734	1200		0	S8.002	1.200	450
26	494192.894	101378.147	3.519	1.069	900		0	S6.000	1.758	225
27	494197.388	101359.599	3.340	1.925	1200		1	S7.000	2.450	150
28	494220.559	101365.203	3.256	1.946	1200		2	S6.000	1.490	225
29	494226.507	101366.646	3.235	1.995	1200		0	S6.001	1.415	300
30	494225.866	101383.980	3.623	2.503	1500		1	S6.001	1.310	300
31	494233.398	101386.902	3.451	2.391	1800		0	S6.002	1.310	300
32	494232.839	101447.511	3.456	2.526	1800		1	S6.002	1.240	300
33	494232.393	101477.837	3.456	2.596	1800		1	S6.003	1.240	300
							0	S8.002	1.120	450
							2	S6.003	1.120	300
							3	S3.006	1.120	600
							0	S3.007	1.120	225
							1	S3.007	1.060	225
							0	S3.008	1.060	750
							1	S1.008	1.080	600
							2	S3.008	0.930	750
							0	S1.009	0.930	750
							1	S1.009	0.860	750
							0	S1.010	0.860	1200

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
34	494230.095	101517.661	3.230	2.450	1800	 1	S1.010	0.780	1200
						0	S1.011	0.780	1200
35	494097.702	101564.737	3.634	1.064	900	 1	S9.000	2.570	150
						0	S9.001	2.570	150
36	494100.770	101572.123	3.699	1.564	1500	 1	S9.001	2.510	150
						0	S9.002	2.135	450
37	494140.283	101572.672	3.699	1.849	1500	 1	S9.002	2.000	450
						0	S9.003	1.850	600
38	494173.595	101573.140	3.707	1.947	1500	 1	S9.003	1.760	600
						0	S9.004	1.760	600
39	494163.985	101582.507	3.517	2.627	1500	 0	S10.000	0.890	600
40	494175.985	101576.646	3.499	2.629	1500	 1	S10.000	0.870	600
						2	S9.004	0.870	600
						0	S9.005	0.870	600
41	494204.285	101557.358	3.415	2.615	1500	 1	S9.005	0.800	600
						0	S9.006	0.800	600
J1	494182.883	101517.961	2.391	0.786	1200	 0	S11.000A	1.605	225
43	494201.716	101521.011	3.000	1.605	1200	 1	S11.000A	1.470	225
						0	S11.000	1.395	300
44	494201.549	101531.374	3.150	1.835	1200	 1	S11.000	1.315	300
						0	S11.001	1.315	300
45	494158.278	101587.058	3.522	1.522	900	 0	S12.000	2.000	225
46	494185.655	101574.790	3.275	1.785	900	 1	S12.000	1.490	225
						0	S12.001	1.490	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
47	494200.191	101564.150	3.371	2.181	1200		1 S12.001	1.190	225
						0	S12.002	1.190	225
48	494204.850	101560.596	3.370	2.250	1200		1 S12.002	1.120	225
						0	S12.003	1.120	300
49	494213.587	101555.791	3.348	2.568	1800		1 S11.001	1.080	300
						2	S12.003	1.080	300
						3	S9.006	0.780	600
						0	S9.007	0.780	225
50	494226.874	101555.916	3.341	2.641	1800		1 S9.007	0.700	225
						2	S1.011	0.700	1200
						0	S1.012	0.700	450
ExMH2	494226.798	101573.518	2.860	2.220	1800		1 Ex 1	0.670	225
						2	S1.012	0.640	450
						0	Ex 2	0.670	750
ExMH1	494150.911	101606.609	3.580	1.300	1200		0 Ex 1	2.280	225
ExMH3	494245.463	101578.840	2.680	2.040	1800		1 Ex 2	0.640	750
						0	Ex 3	0.640	750
ExMH4	494277.278	101609.015	2.710	2.200	1800		1 Ex 3	0.510	750
						0	Ex 4	0.510	750
ExMH5	494340.155	101673.616	2.370	1.910	1800		1 Ex 4	0.460	750
						0	Ex 5	0.460	750
ExMH6	494379.221	101715.415	2.430	2.260	1800		1 Ex 5	0.170	750
						0	Ex 6	0.170	225
Outfall	494378.469	101722.864	2.440	2.290			1 Ex 6	0.150	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 | 2160

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	0	0	0
30	40	0	0
100	45	0	0

Node Outfall Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m ²)	0	Evapo-transpiration (mm/day)	0
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)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.500	255	0.500	510	0.500	765	0.500	1020	0.500	1275	0.500
15	0.500	270	0.500	525	0.500	780	0.500	1035	0.500	1290	0.500
30	0.500	285	0.500	540	0.500	795	0.500	1050	0.500	1305	0.500
45	0.500	300	0.500	555	0.500	810	0.500	1065	0.500	1320	0.500
60	0.500	315	0.500	570	0.500	825	0.500	1080	0.500	1335	0.500
75	0.500	330	0.500	585	0.500	840	0.500	1095	0.500	1350	0.500
90	0.500	345	0.500	600	0.500	855	0.500	1110	0.500	1365	0.500
105	0.500	360	0.500	615	0.500	870	0.500	1125	0.500	1380	0.500
120	0.500	375	0.500	630	0.500	885	0.500	1140	0.500	1395	0.500
135	0.500	390	0.500	645	0.500	900	0.500	1155	0.500	1410	0.500
150	0.500	405	0.500	660	0.500	915	0.500	1170	0.500	1425	0.500
165	0.500	420	0.500	675	0.500	930	0.500	1185	0.500	1440	0.500
180	0.500	435	0.500	690	0.500	945	0.500	1200	0.500		
195	0.500	450	0.500	705	0.500	960	0.500	1215	0.500		
210	0.500	465	0.500	720	0.500	975	0.500	1230	0.500		
225	0.500	480	0.500	735	0.500	990	0.500	1245	0.500		
240	0.500	495	0.500	750	0.500	1005	0.500	1260	0.500		

Node 11 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	1.100	Product Number	CTL-SHE-0087-5000-2470-5000
Design Depth (m)	2.470	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node 30 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	1.120	Product Number	CTL-SHE-0128-1000-2230-1000
Design Depth (m)	2.230	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	10.0	Min Node Diameter (mm)	1500

Node 49 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.780	Product Number	CTL-SHE-0086-5000-2570-5000
Design Depth (m)	2.570	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node 50 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.700	Product Number	CTL-SHE-0137-1100-2000-1100
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	11.0	Min Node Diameter (mm)	1500

Node ExMH6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	0.510	Product Number	CTL-SHE-0165-1600-2000-1600
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	16.0	Min Node Diameter (mm)	1800

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.530
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	542.0	542.0	0.300	542.0	566.8

Node 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	150.0	0.0	0.800	150.0	0.0	0.801	0.0	0.0

Node 9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

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	200.0	200.0	0.350	200.0	217.5	0.351	0.0	217.5

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.220
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	375.0	0.0	0.800	375.0	0.0	0.801	0.0	0.0

Node 17 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.320
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	770.0	0.0	0.800	770.0	0.0	0.801	0.0	0.0

Node 23 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.270
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	500.0	0.0	0.800	500.0	0.0	0.801	0.0	0.0

Node 24 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	350.0	0.0	1.200	350.0	0.0	1.201	0.0	0.0

Node 25 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

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	660.0	660.0	0.350	660.0	691.9	0.351	0.0	691.9

Node 26 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	4

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	137.5	137.5	0.350	137.5	152.0	0.351	0.0	152.0

Node 39 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.920
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	



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	780.0	0.0	1.200	780.0	0.0	1.201	0.0	0.0

Node 45 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

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	313.0	313.0	0.350	313.0	335.0	0.351	0.0	335.0

Node 45 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.860
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	132.0	132.0	0.420	132.0	149.1

Results for 1 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	2.275	0.075	9.9	0.0478	0.0000	OK
15 minute summer	2	11	1.971	0.071	9.8	0.0449	0.0000	OK
15 minute summer	3	11	1.749	0.079	12.3	0.0505	0.0000	OK
15 minute summer	4	11	1.622	0.142	33.6	0.0901	0.0000	OK
15 minute summer	5	11	1.568	0.138	33.6	0.1563	0.0000	OK
360 minute summer	6	288	1.374	0.114	10.1	10.8216	0.0000	OK
360 minute summer	7	288	1.374	0.154	10.5	0.2721	0.0000	OK
360 minute summer	8	288	1.374	0.214	17.5	0.3781	0.0000	OK
15 minute summer	9	10	1.848	0.048	10.7	0.0544	0.0000	OK
360 minute summer	10	288	1.374	0.174	16.3	55.3301	0.0000	OK
360 minute summer	11	288	1.374	0.274	17.0	0.6972	0.0000	OK
15 minute summer	12	1	3.000	0.000	0.0	0.0000	0.0000	OK
15 minute summer	13	12	2.619	0.044	3.2	0.0281	0.0000	OK
15 minute summer	14	12	2.115	0.040	2.7	0.0253	0.0000	OK
15 minute summer	15	10	1.923	0.128	34.6	0.2253	0.0000	OK
15 minute summer	16	10	1.728	0.173	94.6	0.3048	0.0000	OK
480 minute summer	17	376	1.426	0.121	17.9	77.9343	0.0000	OK
15 minute summer	18	10	2.015	0.090	31.7	0.1016	0.0000	OK
15 minute summer	19	12	1.627	0.372	124.8	0.6573	0.0000	OK
15 minute summer	20	12	1.624	0.449	48.9	0.7938	0.0000	OK
15 minute summer	J2	9	1.802	0.192	20.7	0.2176	0.0000	OK
15 minute summer	22	9	1.792	0.442	65.5	0.7813	0.0000	OK
360 minute summer	23	224	1.432	0.162	27.5	77.1897	0.0000	OK
360 minute summer	24	224	1.431	0.231	27.5	77.2738	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 summer	1	S1.000	2	9.8	0.891	0.231	0.4949	
15 minute summer	2	S1.001	3	9.8	0.846	0.211	0.3340	
15 minute summer	3	S1.002	4	12.1	0.534	0.157	0.9363	
15 minute summer	4	S1.003	5	33.6	1.045	0.331	0.1921	
15 minute summer	5	S1.004	6	33.5	0.871	0.190	0.7674	
360 minute summer	6	S1.005	7	7.5	0.381	0.023	0.8087	
360 minute summer	7	S1.006	8	10.1	0.266	0.031	1.8985	
360 minute summer	8	S1.007	11	17.0	0.237	0.053	2.9078	
15 minute summer	9	S2.000	10	10.7	1.804	0.088	0.0410	
360 minute summer	10	S2.001	11	-13.2	-0.274	-0.049	1.1405	
360 minute summer	11	Hydro-Brake®	32	3.4				
15 minute summer	12	S3.000	13	0.0	0.000	0.000	0.1389	
15 minute summer	12	S9.000	35	0.0	0.000	0.000	0.0967	
15 minute summer	13	S3.001	14	2.7	0.629	0.188	0.2769	
15 minute summer	14	S3.002	15	2.7	0.594	0.063	0.0365	
15 minute summer	15	S3.003	16	33.9	0.966	0.160	0.7364	
15 minute summer	16	S3.004	19	93.3	1.051	0.189	7.1643	
480 minute summer	17	S4.000	19	-17.9	-0.447	-0.059	1.3287	
15 minute summer	18	S5.000	19	31.5	1.876	0.171	0.2265	
15 minute summer	19	S3.005	20	48.9	0.709	0.159	8.1277	
15 minute summer	20	S3.006	30	64.9	0.461	0.128	2.4145	
15 minute summer	J2	S8.000A	22	24.4	0.977	0.320	1.1578	
15 minute summer	22	S8.000	23	78.7	2.090	0.291	0.9074	
360 minute summer	23	S8.001	24	-9.7	0.285	-0.058	1.7534	
360 minute summer	24	S8.002	30	-27.5	-0.352	-0.148	2.3833	

Results for 1 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	10	1.866	0.108	18.5	0.1219	0.0000	OK
15 minute summer	26	10	2.498	0.048	8.2	0.0306	0.0000	OK
15 minute summer	27	12	1.677	0.262	28.3	0.2961	0.0000	OK
15 minute summer	28	12	1.657	0.347	35.2	0.3929	0.0000	SURCHARGED
15 minute summer	29	12	1.644	0.404	35.3	0.4567	0.0000	SURCHARGED
15 minute summer	30	12	1.617	0.497	102.7	0.8780	0.0000	SURCHARGED
480 minute winter	31	456	1.249	0.189	8.2	0.4804	0.0000	OK
480 minute winter	32	456	1.249	0.319	13.4	0.8108	0.0000	OK
480 minute winter	33	456	1.248	0.388	13.5	0.9887	0.0000	OK
480 minute winter	34	456	1.248	0.468	13.2	1.1922	0.0000	OK
15 minute summer	35	11	2.604	0.034	1.7	0.0215	0.0000	OK
15 minute summer	36	11	2.231	0.096	18.9	0.1703	0.0000	OK
15 minute summer	37	10	2.027	0.177	66.6	0.3130	0.0000	OK
15 minute summer	38	11	1.819	0.059	65.7	0.1038	0.0000	OK
1440 minute winter	39	1350	1.252	0.362	9.4	247.0836	0.0000	OK
1440 minute winter	40	1350	1.252	0.382	9.6	0.6751	0.0000	OK
1440 minute winter	41	1350	1.252	0.452	5.2	0.7988	0.0000	OK
15 minute summer	J1	10	1.662	0.057	6.0	0.0647	0.0000	OK
15 minute summer	43	10	1.515	0.120	28.0	0.1355	0.0000	OK
15 minute summer	44	10	1.425	0.110	27.8	0.1242	0.0000	OK
15 minute summer	45	10	2.082	0.082	18.3	0.0520	0.0000	OK
15 minute summer	46	10	1.569	0.079	18.2	0.0504	0.0000	OK
15 minute summer	47	11	1.318	0.128	25.2	0.1443	0.0000	OK
15 minute summer	48	11	1.259	0.139	24.9	0.1569	0.0000	OK
1440 minute winter	49	1350	1.252	0.472	5.3	1.2014	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	25	S6.000	27	18.1	0.952	0.451	1.1466	
15 minute summer	26	S7.000	27	8.1	1.698	0.211	0.1727	
15 minute summer	27	S6.001	28	27.9	0.757	0.379	1.6169	
15 minute summer	28	S6.002	29	35.3	0.973	0.297	0.4310	
15 minute summer	29	S6.003	30	36.4	0.599	0.395	1.2215	
15 minute summer	30	Hydro-Brake®	31	9.2				
480 minute winter	31	S3.008	32	8.2	0.387	0.014	8.0242	
480 minute winter	32	S1.009	33	12.4	0.484	0.021	6.1905	
480 minute winter	33	S1.010	34	12.4	0.368	0.007	14.4173	
480 minute winter	34	S1.011	50	11.7	0.148	0.006	17.4491	
15 minute summer	35	S9.001	36	1.6	0.552	0.104	0.0232	
15 minute summer	36	S9.002	37	18.5	0.771	0.098	0.9477	
15 minute summer	37	S9.003	38	65.7	1.696	0.184	1.3911	
15 minute summer	38	S9.004	40	65.8	1.439	0.021	0.3785	
1440 minute winter	39	S10.000	40	-9.4	-0.221	-0.036	2.4512	
1440 minute winter	40	S9.005	41	-5.0	0.188	-0.016	7.1434	
1440 minute winter	41	S9.006	49	-5.2	0.095	-0.017	2.1963	
15 minute summer	J1	S11.000A	43	5.9	0.758	0.135	0.1479	
15 minute summer	43	S11.000	44	27.8	1.123	0.285	0.2568	
15 minute summer	44	S11.001	49	27.4	1.157	0.265	0.7387	
15 minute summer	45	S12.000	46	18.2	1.427	0.267	0.3819	
15 minute summer	46	S12.001	47	18.0	1.018	0.268	0.3202	
15 minute summer	47	S12.002	48	24.9	1.054	0.438	0.1433	
15 minute summer	48	S12.003	49	24.8	0.873	0.354	0.3163	
1440 minute winter	49	Hydro-Brake®	50	3.6				

Results for 1 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	50	456	1.248	0.548	11.8	1.3957	0.0000	SURCHARGED
360 minute summer	ExMH2	224	1.077	0.437	18.1	1.1128	0.0000	OK
15 minute summer	ExMH1	11	2.329	0.049	7.8	0.0551	0.0000	OK
360 minute summer	ExMH3	224	1.077	0.437	16.6	1.1127	0.0000	OK
360 minute summer	ExMH4	224	1.077	0.567	17.1	1.4434	0.0000	OK
360 minute summer	ExMH5	224	1.077	0.617	16.5	1.5703	0.0000	OK
360 minute summer	ExMH6	224	1.077	0.907	16.0	2.3081	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.650	0.500	9.5	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)
480 minute winter	50	Hydro-Brake®	ExMH2	10.7				
360 minute summer	ExMH2	Ex 2	ExMH3	16.6	0.481	0.034	4.9548	
15 minute summer	ExMH1	Ex 1	ExMH2	7.5	0.497	0.104	1.3260	
360 minute summer	ExMH3	Ex 3	ExMH4	14.0	0.382	0.021	13.6729	
360 minute summer	ExMH4	Ex 4	ExMH5	13.0	0.353	0.045	33.5550	
360 minute summer	ExMH5	Ex 5	ExMH6	14.6	0.136	0.017	23.6771	
360 minute summer	ExMH6	Ex 6	Outfall	15.7	0.394	0.589	0.2978	402.4

Results for 2 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	2.295	0.095	15.2	0.0603	0.0000	OK
15 minute summer	2	11	1.989	0.089	15.0	0.0569	0.0000	OK
15 minute summer	3	11	1.769	0.099	18.9	0.0633	0.0000	OK
15 minute summer	4	11	1.665	0.185	51.7	0.1179	0.0000	OK
15 minute summer	5	11	1.605	0.175	51.7	0.1975	0.0000	OK
360 minute winter	6	344	1.444	0.184	8.8	20.8720	0.0000	OK
360 minute winter	7	344	1.444	0.224	8.5	0.3953	0.0000	OK
360 minute winter	8	344	1.444	0.284	13.7	0.5013	0.0000	OK
15 minute summer	9	10	1.860	0.060	16.3	0.0684	0.0000	OK
240 minute winter	10	236	1.444	0.244	17.0	80.3165	0.0000	OK
240 minute winter	11	236	1.444	0.344	17.4	0.8747	0.0000	OK
15 minute summer	12	1	3.000	0.000	0.0	0.0000	0.0000	OK
15 minute summer	13	12	2.631	0.056	4.9	0.0357	0.0000	OK
15 minute summer	14	12	2.125	0.050	4.3	0.0319	0.0000	OK
15 minute summer	15	10	1.956	0.161	53.0	0.2844	0.0000	OK
15 minute summer	16	10	1.770	0.215	144.7	0.3806	0.0000	OK
360 minute winter	17	352	1.492	0.187	28.6	126.2671	0.0000	OK
15 minute summer	18	9	2.036	0.111	48.3	0.1252	0.0000	OK
15 minute summer	19	11	1.768	0.513	191.2	0.9068	0.0000	OK
15 minute summer	20	11	1.755	0.580	84.8	1.0247	0.0000	OK
15 minute summer	J2	8	1.860	0.250	31.5	0.2823	0.0000	OK
15 minute winter	22	8	1.844	0.494	88.4	0.8721	0.0000	SURCHARGED
360 minute winter	23	352	1.492	0.222	20.8	105.7300	0.0000	OK
360 minute winter	24	352	1.492	0.292	19.7	97.5206	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 summer	1	S1.000	2	15.0	0.991	0.355	0.6817	
15 minute summer	2	S1.001	3	15.0	0.949	0.324	0.4561	
15 minute summer	3	S1.002	4	18.7	0.585	0.243	1.2998	
15 minute summer	4	S1.003	5	51.7	1.173	0.509	0.2632	
15 minute summer	5	S1.004	6	51.7	0.980	0.293	1.0531	
360 minute winter	6	S1.005	7	6.3	0.372	0.019	1.4475	
360 minute winter	7	S1.006	8	8.2	0.258	0.025	2.9259	
360 minute winter	8	S1.007	11	13.2	0.212	0.041	4.0231	
15 minute summer	9	S2.000	10	16.2	2.012	0.134	0.0560	
240 minute winter	10	S2.001	11	-13.5	-0.276	-0.050	1.5750	
240 minute winter	11	Hydro-Brake®	32	3.4				
15 minute summer	12	S3.000	13	0.0	0.000	0.000	0.1926	
15 minute summer	12	S9.000	35	0.0	0.000	0.000	0.1307	
15 minute summer	13	S3.001	14	4.3	0.713	0.296	0.3836	
15 minute summer	14	S3.002	15	4.3	0.676	0.099	0.0506	
15 minute summer	15	S3.003	16	52.1	1.082	0.246	1.0097	
15 minute summer	16	S3.004	19	142.8	1.081	0.288	10.0346	
360 minute winter	17	S4.000	19	-28.6	-0.521	-0.094	2.2235	
15 minute summer	18	S5.000	19	48.4	2.045	0.262	0.5097	
15 minute summer	19	S3.005	20	84.8	0.758	0.276	10.6199	
15 minute summer	20	S3.006	30	104.3	0.473	0.206	2.8441	
15 minute summer	J2	S8.000A	22	41.2	1.001	0.540	1.3309	
15 minute winter	22	S8.000	23	107.2	2.320	0.396	0.9119	
360 minute winter	23	S8.001	24	8.3	0.244	0.050	2.4533	
360 minute winter	24	S8.002	30	-19.7	-0.284	-0.106	2.9846	

Results for 2 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	11	1.961	0.203	28.2	0.2296	0.0000	OK
15 minute summer	26	10	2.509	0.059	12.5	0.0374	0.0000	OK
15 minute summer	27	11	1.870	0.455	41.3	0.5151	0.0000	SURCHARGED
15 minute summer	28	11	1.834	0.524	54.1	0.5924	0.0000	SURCHARGED
15 minute summer	29	11	1.804	0.564	55.9	0.6378	0.0000	SURCHARGED
15 minute summer	30	11	1.744	0.624	163.8	1.1028	0.0000	SURCHARGED
360 minute summer	31	248	1.339	0.279	8.4	0.7112	0.0000	OK
360 minute summer	32	248	1.339	0.409	15.1	1.0418	0.0000	OK
360 minute summer	33	248	1.339	0.479	15.1	1.2198	0.0000	OK
360 minute summer	34	248	1.339	0.559	14.4	1.4234	0.0000	OK
15 minute summer	35	11	2.612	0.042	2.5	0.0266	0.0000	OK
15 minute summer	36	11	2.255	0.120	28.9	0.2118	0.0000	OK
15 minute summer	37	10	2.069	0.219	102.0	0.3862	0.0000	OK
15 minute summer	38	10	1.832	0.072	100.9	0.1270	0.0000	OK
960 minute winter	39	960	1.345	0.455	15.3	315.8056	0.0000	OK
960 minute winter	40	945	1.345	0.475	15.6	0.8386	0.0000	OK
960 minute winter	41	945	1.345	0.545	8.0	0.9623	0.0000	OK
15 minute summer	J1	10	1.677	0.072	9.2	0.0812	0.0000	OK
15 minute summer	43	10	1.548	0.153	42.7	0.1734	0.0000	OK
15 minute summer	44	10	1.450	0.135	42.6	0.1524	0.0000	OK
15 minute summer	45	10	2.103	0.103	27.9	0.0657	0.0000	OK
15 minute summer	46	10	1.593	0.103	27.7	0.0653	0.0000	OK
15 minute summer	47	11	1.381	0.191	38.7	0.2166	0.0000	OK
960 minute winter	48	945	1.345	0.225	5.6	0.2540	0.0000	OK
960 minute winter	49	945	1.345	0.565	8.1	1.4369	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	25	S6.000	27	25.9	0.962	0.645	1.7287	
15 minute summer	26	S7.000	27	12.5	1.741	0.324	0.2290	
15 minute summer	27	S6.001	28	43.0	0.753	0.585	1.6787	
15 minute summer	28	S6.002	29	55.9	0.980	0.470	0.4310	
15 minute summer	29	S6.003	30	57.8	0.821	0.626	1.2215	
15 minute summer	30	Hydro-Brake®	31	9.2				
360 minute summer	31	S3.008	32	8.3	0.386	0.015	11.9752	
360 minute summer	32	S1.009	33	13.1	0.502	0.022	8.2317	
360 minute summer	33	S1.010	34	12.9	0.425	0.007	18.6419	
360 minute summer	34	S1.011	50	11.6	0.124	0.006	21.5964	
15 minute summer	35	S9.001	36	2.4	0.617	0.157	0.0312	
15 minute summer	36	S9.002	37	28.3	0.866	0.151	1.2935	
15 minute summer	37	S9.003	38	100.9	1.932	0.283	1.8614	
15 minute summer	38	S9.004	40	100.5	1.674	0.032	0.4957	
960 minute winter	39	S10.000	40	-15.3	-0.238	-0.058	3.1264	
960 minute winter	40	S9.005	41	-7.7	0.215	-0.025	8.6966	
960 minute winter	41	S9.006	49	-7.9	0.069	-0.025	2.5649	
15 minute summer	J1	S11.000A	43	9.1	0.822	0.209	0.2210	
15 minute summer	43	S11.000	44	42.6	1.278	0.437	0.3465	
15 minute summer	44	S11.001	49	43.7	1.170	0.424	1.2113	
15 minute summer	45	S12.000	46	27.7	1.574	0.407	0.5312	
15 minute summer	46	S12.001	47	27.8	1.070	0.413	0.4752	
15 minute summer	47	S12.002	48	37.6	1.135	0.662	0.2208	
960 minute winter	48	S12.003	49	3.6	0.495	0.052	0.6100	
960 minute winter	49	Hydro-Brake®	50	1.7				

Results for 2 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	50	248	1.339	0.639	11.7	1.6269	0.0000	SURCHARGED
240 minute summer	ExMH2	152	1.228	0.588	23.2	1.4959	0.0000	OK
15 minute summer	ExMH1	10	2.340	0.060	11.8	0.0682	0.0000	OK
240 minute summer	ExMH3	152	1.228	0.588	20.6	1.4959	0.0000	OK
240 minute summer	ExMH4	152	1.228	0.718	20.6	1.8266	0.0000	OK
240 minute summer	ExMH5	152	1.228	0.768	18.4	1.9534	0.0000	SURCHARGED
240 minute summer	ExMH6	152	1.227	1.057	17.3	2.6911	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.650	0.500	13.5	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)
360 minute summer	50	Hydro-Brake®	ExMH2	10.9				
240 minute summer	ExMH2	Ex 2	ExMH3	20.6	0.509	0.043	7.0011	
15 minute summer	ExMH1	Ex 1	ExMH2	11.5	0.582	0.158	1.6761	
240 minute summer	ExMH3	Ex 3	ExMH4	15.7	0.400	0.023	17.6243	
240 minute summer	ExMH4	Ex 4	ExMH5	13.6	0.381	0.047	39.3644	
240 minute summer	ExMH5	Ex 5	ExMH6	15.4	0.136	0.018	25.1806	
240 minute summer	ExMH6	Ex 6	Outfall	16.0	0.402	0.600	0.2978	350.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	2.370	0.170	37.6	0.1079	0.0000	OK
15 minute summer	2	11	2.072	0.172	37.0	0.1093	0.0000	OK
15 minute summer	3	11	1.956	0.286	46.2	0.1822	0.0000	OK
15 minute summer	4	11	1.883	0.403	126.0	0.2566	0.0000	SURCHARGED
480 minute winter	5	472	1.823	0.393	14.0	0.4443	0.0000	OK
480 minute winter	6	472	1.823	0.563	14.0	75.5723	0.0000	OK
480 minute winter	7	464	1.823	0.603	9.4	1.0655	0.0000	SURCHARGED
480 minute winter	8	464	1.823	0.663	18.5	1.1710	0.0000	SURCHARGED
15 minute summer	9	10	1.903	0.103	40.4	0.1164	0.0000	OK
480 minute winter	10	472	1.823	0.623	20.9	215.9265	0.0000	SURCHARGED
480 minute winter	11	464	1.823	0.723	17.5	1.8400	0.0000	SURCHARGED
15 minute summer	12	1	3.000	0.000	0.0	0.0000	0.0000	OK
15 minute summer	13	11	2.676	0.101	12.2	0.0641	0.0000	OK
15 minute summer	14	10	2.446	0.371	58.9	0.2361	0.0000	SURCHARGED
15 minute summer	15	9	2.491	0.696	140.2	1.2292	0.0000	SURCHARGED
15 minute summer	16	10	2.364	0.809	383.8	1.4295	0.0000	SURCHARGED
480 minute winter	17	480	1.847	0.542	52.3	386.5528	0.0000	OK
15 minute summer	18	10	2.387	0.462	119.9	0.5228	0.0000	SURCHARGED
15 minute summer	19	9	2.125	0.870	506.6	1.5375	0.0000	SURCHARGED
15 minute summer	20	10	2.109	0.934	152.1	1.6510	0.0000	SURCHARGED
15 minute winter	J2	6	2.196	0.586	73.4	0.6624	0.0000	FLOOD RISK
15 minute winter	22	6	2.147	0.797	218.0	1.4091	0.0000	SURCHARGED
480 minute winter	23	472	1.847	0.577	24.7	275.1140	0.0000	SURCHARGED
480 minute winter	24	472	1.847	0.647	19.3	216.1582	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	1	S1.000	2	37.0	1.223	0.874	1.4362	
15 minute summer	2	S1.001	3	36.8	1.093	0.795	1.0433	
15 minute summer	3	S1.002	4	48.4	0.778	0.628	2.7481	
15 minute summer	4	S1.003	5	126.2	1.792	1.242	0.4190	
480 minute winter	5	S1.004	6	14.0	0.674	0.080	3.0437	
480 minute winter	6	S1.005	7	5.6	0.340	0.017	4.7711	
480 minute winter	7	S1.006	8	8.8	0.269	0.027	7.2669	
480 minute winter	8	S1.007	11	17.5	0.218	0.054	7.6058	
15 minute summer	9	S2.000	10	40.3	2.500	0.331	0.1118	
480 minute winter	10	S2.001	11	-16.6	-0.152	-0.062	2.2941	
480 minute winter	11	Hydro-Brake®	32	3.4				
15 minute summer	12	S3.000	13	0.0	0.000	0.000	0.4038	
15 minute summer	12	S9.000	35	0.0	0.000	0.000	0.2620	
15 minute summer	13	S3.001	14	11.2	0.905	0.779	0.9501	
15 minute summer	14	S3.002	15	-51.1	-1.349	-1.186	0.3175	
15 minute summer	15	S3.003	16	156.2	1.292	0.738	3.3043	
15 minute summer	16	S3.004	19	390.0	1.468	0.788	16.2804	
480 minute winter	17	S4.000	19	-52.3	-0.599	-0.171	6.8536	
15 minute summer	18	S5.000	19	124.7	2.166	0.675	0.9490	
15 minute summer	19	S3.005	20	152.1	0.870	0.495	11.1710	
15 minute summer	20	S3.006	30	158.7	0.563	0.314	2.8582	
15 minute winter	J2	S8.000A	22	72.1	1.244	0.945	1.4087	
15 minute winter	22	S8.000	23	218.5	2.859	0.808	0.9207	
480 minute winter	23	S8.001	24	6.5	0.216	0.039	4.1682	
480 minute winter	24	S8.002	30	-19.3	-0.273	-0.104	3.8019	

Results for 30 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	12	2.873	1.115	70.0	5.9909	0.0000	SURCHARGED
15 minute summer	26	12	2.881	0.431	31.1	1.5849	0.0000	SURCHARGED
15 minute summer	27	10	2.573	1.158	90.1	1.3101	0.0000	SURCHARGED
15 minute summer	28	10	2.454	1.144	116.1	1.2941	0.0000	SURCHARGED
15 minute summer	29	10	2.335	1.095	119.2	1.2384	0.0000	SURCHARGED
15 minute summer	30	10	2.099	0.979	286.3	1.7305	0.0000	SURCHARGED
360 minute winter	31	248	1.882	0.822	8.3	2.0913	0.0000	SURCHARGED
360 minute winter	32	248	1.882	0.952	14.5	2.4221	0.0000	SURCHARGED
360 minute winter	33	248	1.882	1.022	14.9	2.6003	0.0000	OK
360 minute winter	34	248	1.882	1.102	14.5	2.8039	0.0000	OK
15 minute summer	35	11	2.640	0.070	6.2	0.0443	0.0000	OK
15 minute summer	36	10	2.336	0.201	71.7	0.3549	0.0000	OK
15 minute summer	37	10	2.201	0.351	255.4	0.6211	0.0000	OK
15 minute summer	38	10	1.872	0.112	252.5	0.1977	0.0000	OK
960 minute winter	39	945	1.753	0.863	28.9	619.4591	0.0000	SURCHARGED
960 minute winter	40	930	1.753	0.883	29.4	1.5609	0.0000	SURCHARGED
960 minute winter	41	975	1.765	0.965	20.1	1.7043	0.0000	SURCHARGED
15 minute summer	J1	10	2.121	0.516	26.1	0.5840	0.0000	FLOOD RISK
15 minute summer	43	10	2.082	0.687	105.6	0.7766	0.0000	SURCHARGED
15 minute summer	44	10	1.929	0.614	105.8	0.6946	0.0000	SURCHARGED
15 minute summer	45	11	2.805	0.805	69.2	1.0531	0.0000	SURCHARGED
15 minute summer	46	10	2.322	0.832	64.5	0.5292	0.0000	SURCHARGED
15 minute summer	47	10	2.013	0.823	88.1	0.9306	0.0000	SURCHARGED
960 minute winter	48	945	1.754	0.634	5.9	0.7167	0.0000	SURCHARGED
960 minute winter	49	930	1.752	0.972	18.9	2.4740	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	25	S6.000	27	62.2	1.565	1.549	1.7741	
15 minute summer	26	S7.000	27	28.5	1.732	0.741	0.3360	
15 minute summer	27	S6.001	28	93.6	1.329	1.274	1.6787	
15 minute summer	28	S6.002	29	119.2	1.692	1.002	0.4310	
15 minute summer	29	S6.003	30	122.4	1.738	1.327	1.2215	
15 minute summer	30	Hydro-Brake®	31	9.2				
360 minute winter	31	S3.008	32	8.3	0.398	0.015	26.6766	
360 minute winter	32	S1.009	33	12.9	0.554	0.022	13.3484	
360 minute winter	33	S1.010	34	12.9	0.430	0.007	42.0062	
360 minute winter	34	S1.011	50	11.9	0.098	0.006	42.3548	
15 minute summer	35	S9.001	36	6.0	0.786	0.394	0.0617	
15 minute summer	36	S9.002	37	70.8	1.081	0.376	2.7092	
15 minute summer	37	S9.003	38	252.5	2.527	0.709	3.4595	
15 minute summer	38	S9.004	40	252.1	2.546	0.080	0.6743	
960 minute winter	39	S10.000	40	-28.9	-0.280	-0.109	3.7618	
960 minute winter	40	S9.005	41	-14.2	0.199	-0.046	9.6469	
960 minute winter	41	S9.006	49	-20.0	-0.079	-0.063	2.6571	
15 minute summer	J1	S11.000A	43	24.0	0.832	0.549	0.7588	
15 minute summer	43	S11.000	44	105.8	1.502	1.085	0.7298	
15 minute summer	44	S11.001	49	107.7	1.530	1.044	1.9170	
15 minute summer	45	S12.000	46	64.5	1.742	0.950	1.1931	
15 minute summer	46	S12.001	47	65.6	1.648	0.975	0.7164	
15 minute summer	47	S12.002	48	89.3	2.247	1.572	0.2331	
960 minute winter	48	S12.003	49	10.5	0.534	0.150	0.7022	
960 minute winter	49	Hydro-Brake®	50	2.3				

Results for 30 year Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	50	248	1.882	1.182	12.1	3.0075	0.0000	SURCHARGED
30 minute winter	ExMH2	23	2.484	1.844	98.9	4.6941	0.0000	SURCHARGED
120 minute summer	ExMH1	66	2.437	0.157	13.0	0.1775	0.0000	OK
120 minute summer	ExMH3	64	2.460	1.820	62.3	4.6319	0.0000	FLOOD RISK
30 minute summer	ExMH4	22	2.434	1.924	105.0	4.8974	0.0000	FLOOD RISK
120 minute summer	ExMH5	64	2.370	1.910	121.0	4.8610	59.6303	FLOOD
60 minute winter	ExMH6	38	2.414	2.244	52.8	5.7119	0.0000	FLOOD RISK
15 minute summer	Outfall	1	0.650	0.500	16.0	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)
360 minute winter	50	Hydro-Brake®	ExMH2	11.0				
30 minute winter	ExMH2	Ex 2	ExMH3	87.3	0.916	0.181	8.5423	
120 minute summer	ExMH1	Ex 1	ExMH2	12.8	0.436	0.176	2.8701	
120 minute summer	ExMH3	Ex 3	ExMH4	67.3	0.443	0.100	19.2989	
30 minute summer	ExMH4	Ex 4	ExMH5	50.5	0.495	0.176	39.6562	
120 minute summer	ExMH5	Ex 5	ExMH6	-19.6	0.149	-0.022	25.1806	
60 minute winter	ExMH6	Ex 6	Outfall	16.0	0.403	0.601	0.2978	248.8

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	3.070	0.870	52.6	0.5533	0.0000	SURCHARGED
15 minute summer	2	11	2.594	0.694	49.9	0.4415	0.0000	SURCHARGED
720 minute winter	3	705	2.587	0.917	5.1	0.5835	0.0000	FLOOD RISK
720 minute winter	4	705	2.587	1.107	14.1	32.0013	0.0000	FLOOD RISK
720 minute winter	5	690	2.588	1.158	13.6	1.3102	0.0000	SURCHARGED
720 minute winter	6	690	2.587	1.327	15.0	116.4880	0.0000	SURCHARGED
720 minute winter	7	690	2.589	1.369	8.8	2.4190	0.0000	SURCHARGED
720 minute winter	8	690	2.588	1.428	17.0	2.5229	0.0000	SURCHARGED
720 minute winter	9	690	2.588	0.788	4.2	0.8909	0.0000	SURCHARGED
720 minute winter	10	690	2.588	1.388	22.8	287.8083	0.0000	SURCHARGED
720 minute winter	11	690	2.589	1.489	19.0	3.7898	0.0000	SURCHARGED
15 minute summer	12	12	3.026	0.026	2.8	0.0162	0.0000	OK
15 minute summer	13	11	3.079	0.504	18.6	0.3204	0.0000	SURCHARGED
15 minute summer	14	9	2.862	0.787	19.3	0.5007	0.0000	SURCHARGED
15 minute summer	15	9	2.874	1.079	184.2	1.9070	0.0000	SURCHARGED
15 minute summer	16	9	2.741	1.186	511.0	2.0961	0.0000	SURCHARGED
960 minute winter	17	915	2.393	1.088	34.4	587.1625	0.0000	SURCHARGED
15 minute summer	18	9	2.843	0.918	167.8	1.0380	0.0000	SURCHARGED
15 minute summer	19	9	2.428	1.173	683.5	2.0733	0.0000	SURCHARGED
960 minute winter	20	915	2.392	1.217	17.6	2.1513	0.0000	SURCHARGED
720 minute winter	J2	690	2.391	0.781	8.8	0.8833	10.1739	FLOOD
720 minute winter	22	690	2.393	1.043	24.5	1.8426	0.0000	SURCHARGED
720 minute winter	23	705	2.393	1.123	28.4	382.2223	0.0000	SURCHARGED
720 minute winter	24	690	2.392	1.192	24.7	398.4804	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	1	S1.000	2	49.9	1.255	1.179	1.7897	
15 minute summer	2	S1.001	3	49.9	1.254	1.076	1.1478	
720 minute winter	3	S1.002	4	5.1	0.402	0.066	2.7699	
720 minute winter	4	S1.003	5	13.6	0.817	0.134	0.4201	
720 minute winter	5	S1.004	6	13.2	0.639	0.075	3.1603	
720 minute winter	6	S1.005	7	-8.9	0.327	-0.027	4.8336	
720 minute winter	7	S1.006	8	7.4	0.248	0.022	7.2684	
720 minute winter	8	S1.007	11	16.1	0.186	0.050	7.6058	
720 minute winter	9	S2.000	10	4.2	1.291	0.035	0.2760	
720 minute winter	10	S2.001	11	-18.6	-0.117	-0.069	2.2941	
720 minute winter	11	Hydro-Brake®	32	3.7				
15 minute summer	12	S3.000	13	-2.8	-0.259	-0.196	0.6286	
15 minute summer	12	S9.000	35	0.9	0.156	0.063	0.3958	
15 minute summer	13	S3.001	14	19.3	1.102	1.338	1.1311	
15 minute summer	14	S3.002	15	21.4	0.990	0.497	0.3175	
15 minute summer	15	S3.003	16	192.2	1.366	0.908	3.3043	
15 minute summer	16	S3.004	19	511.6	1.816	1.034	16.2804	
960 minute winter	17	S4.000	19	-34.4	-0.412	-0.112	7.0352	
15 minute summer	18	S5.000	19	171.9	2.441	0.931	0.9490	
15 minute summer	19	S3.005	20	194.0	0.871	0.632	11.1710	
960 minute winter	20	S3.006	30	19.1	0.246	0.038	2.8582	
720 minute winter	J2	S8.000A	22	8.2	0.682	0.107	1.4087	
720 minute winter	22	S8.000	23	24.1	0.988	0.089	1.8063	
720 minute winter	23	S8.001	24	7.7	0.218	0.047	4.1682	
720 minute winter	24	S8.002	30	-24.7	-0.256	-0.133	3.8019	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	13	2.922	1.164	98.0	15.7120	0.0000	SURCHARGED
15 minute summer	26	13	2.973	0.523	43.5	5.4062	0.0000	SURCHARGED
15 minute summer	27	9	2.734	1.319	94.3	1.4919	0.0000	SURCHARGED
15 minute summer	28	9	2.665	1.355	126.7	1.5328	0.0000	SURCHARGED
15 minute summer	29	9	2.556	1.316	128.8	1.4884	0.0000	SURCHARGED
960 minute winter	30	915	2.393	1.273	26.7	2.2488	0.0000	SURCHARGED
240 minute winter	31	156	2.337	1.277	11.5	3.2497	0.0000	SURCHARGED
240 minute winter	32	156	2.337	1.407	17.4	3.5803	0.0000	SURCHARGED
240 minute winter	33	156	2.337	1.477	16.6	3.7582	0.0000	SURCHARGED
240 minute winter	34	156	2.337	1.557	15.7	3.9618	0.0000	SURCHARGED
15 minute summer	35	11	2.656	0.086	8.7	0.0546	0.0000	OK
15 minute summer	36	10	2.385	0.250	100.4	0.4411	0.0000	OK
960 minute winter	37	930	2.310	0.460	21.3	0.8133	0.0000	OK
960 minute winter	38	885	2.307	0.547	21.3	0.9664	0.0000	OK
1440 minute winter	39	1320	2.372	1.482	28.7	892.5601	0.0000	SURCHARGED
960 minute summer	40	930	2.485	1.615	60.9	2.8530	0.0000	SURCHARGED
1440 minute winter	41	1380	2.339	1.539	15.4	2.7202	0.0000	SURCHARGED
15 minute summer	J1	9	2.391	0.786	31.9	0.8890	3.7392	FLOOD
15 minute summer	43	9	2.415	1.020	127.3	1.1535	0.0000	SURCHARGED
960 minute winter	44	870	2.303	0.988	8.6	1.1180	0.0000	SURCHARGED
15 minute summer	45	12	2.868	0.868	96.9	8.0862	0.0000	SURCHARGED
15 minute summer	46	10	2.468	0.978	72.0	0.6219	0.0000	SURCHARGED
960 minute winter	47	900	2.306	1.116	7.9	1.2620	0.0000	SURCHARGED
960 minute winter	48	900	2.307	1.187	7.8	1.3422	0.0000	SURCHARGED
960 minute winter	49	900	2.311	1.531	20.1	3.8957	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	25	S6.000	27	68.8	1.731	1.714	1.7741	
15 minute summer	26	S7.000	27	31.1	1.768	0.809	0.3360	
15 minute summer	27	S6.001	28	94.9	1.348	1.292	1.6787	
15 minute summer	28	S6.002	29	128.8	1.830	1.084	0.4310	
15 minute summer	29	S6.003	30	132.0	1.874	1.430	1.2215	
960 minute winter	30	Hydro-Brake®	31	8.0				
240 minute winter	31	S3.008	32	-11.5	0.402	-0.020	26.6766	
240 minute winter	32	S1.009	33	13.6	0.571	0.023	13.3484	
240 minute winter	33	S1.010	34	13.6	0.494	0.007	44.9444	
240 minute winter	34	S1.011	50	12.3	0.195	0.006	43.2544	
15 minute summer	35	S9.001	36	8.5	0.852	0.553	0.0799	
15 minute summer	36	S9.002	37	99.4	1.113	0.528	3.7160	
960 minute winter	37	S9.003	38	21.3	1.185	0.060	8.3892	
960 minute winter	38	S9.004	40	27.6	0.559	0.009	1.1788	
1440 minute winter	39	S10.000	40	-28.7	-0.266	-0.109	3.7618	
960 minute summer	40	S9.005	41	-28.8	-0.102	-0.093	9.6469	
1440 minute winter	41	S9.006	49	-15.3	-0.062	-0.048	2.6571	
15 minute summer	J1	S11.000A	43	29.8	0.826	0.682	0.7588	
15 minute summer	43	S11.000	44	128.1	1.819	1.313	0.7298	
960 minute winter	44	S11.001	49	8.3	0.697	0.080	1.9170	
15 minute summer	45	S12.000	46	72.0	1.810	1.060	1.1931	
15 minute summer	46	S12.001	47	72.6	1.825	1.080	0.7164	
960 minute winter	47	S12.002	48	7.8	0.714	0.137	0.2331	
960 minute winter	48	S12.003	49	7.7	0.522	0.110	0.7022	
960 minute winter	49	Hydro-Brake®	50	2.2				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	50	156	2.337	1.637	12.9	4.1654	0.0000	SURCHARGED
60 minute summer	ExMH2	32	2.708	2.068	127.3	5.2631	0.0000	FLOOD RISK
30 minute summer	ExMH1	19	2.846	0.566	37.2	0.6396	0.0000	SURCHARGED
30 minute winter	ExMH3	19	2.676	2.036	112.5	5.1805	0.0000	FLOOD RISK
60 minute summer	ExMH4	32	2.611	2.101	153.5	5.3463	0.0000	FLOOD RISK
180 minute winter	ExMH5	84	2.370	1.910	76.1	4.8610	138.3019	FLOOD
30 minute summer	ExMH6	19	2.423	2.253	120.3	5.7342	0.0000	FLOOD RISK
15 minute summer	Outfall	1	0.650	0.500	16.5	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)
240 minute winter	50	Hydro-Brake®	ExMH2	11.0				
60 minute summer	ExMH2	Ex 2	ExMH3	109.8	0.685	0.228	8.5423	
30 minute summer	ExMH1	Ex 1	ExMH2	36.2	1.065	0.498	3.2926	
30 minute winter	ExMH3	Ex 3	ExMH4	128.0	0.666	0.191	19.2989	
60 minute summer	ExMH4	Ex 4	ExMH5	158.8	0.471	0.553	39.6562	
180 minute winter	ExMH5	Ex 5	ExMH6	16.5	0.148	0.019	25.1806	
30 minute summer	ExMH6	Ex 6	Outfall	16.0	0.402	0.600	0.2978	231.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	3.376	1.176	68.3	0.7479	1.8841	FLOOD
15 minute summer	2	10	2.882	0.982	53.6	0.6245	0.0000	SURCHARGED
960 minute winter	3	900	2.830	1.160	5.2	0.7378	0.3850	FLOOD
960 minute winter	4	900	2.830	1.350	24.3	163.7296	5.1248	FLOOD
960 minute winter	5	900	2.833	1.403	13.8	1.5864	0.0000	FLOOD RISK
960 minute winter	6	915	2.831	1.571	40.2	116.9193	0.0000	FLOOD RISK
960 minute winter	7	930	2.838	1.618	28.8	2.8595	0.0000	SURCHARGED
960 minute winter	8	960	2.830	1.670	23.8	2.9509	0.0000	SURCHARGED
960 minute winter	9	960	2.832	1.032	4.4	10.8914	0.0000	SURCHARGED
960 minute winter	10	960	2.831	1.631	25.0	288.2379	0.0000	SURCHARGED
960 minute winter	11	930	2.830	1.730	21.0	4.4031	0.0000	SURCHARGED
15 minute summer	12	12	3.091	0.091	12.5	0.0580	0.0000	OK
15 minute summer	13	10	3.465	0.890	30.6	0.5658	0.0000	FLOOD RISK
15 minute summer	14	9	3.279	1.204	19.9	0.7658	0.0000	SURCHARGED
15 minute summer	15	9	3.298	1.503	232.1	2.6551	0.0000	SURCHARGED
15 minute summer	16	9	3.160	1.605	652.1	2.8365	0.0000	SURCHARGED
360 minute winter	17	248	2.596	1.291	103.4	587.3922	0.0000	SURCHARGED
15 minute summer	18	9	3.294	1.369	217.9	1.5485	0.0000	SURCHARGED
480 minute winter	19	312	2.596	1.341	90.1	2.3704	0.0000	SURCHARGED
360 minute winter	20	248	2.594	1.419	57.8	2.5070	0.0000	SURCHARGED
1440 minute winter	J2	870	2.391	0.781	51.4	0.8833	630.8043	FLOOD
360 minute winter	22	248	2.550	1.200	84.8	2.1206	0.0000	SURCHARGED
360 minute winter	23	248	2.560	1.290	68.5	382.5169	0.0000	SURCHARGED
360 minute winter	24	248	2.576	1.376	120.1	401.5985	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	1	S1.000	2	53.6	1.348	1.266	1.7897	
15 minute summer	2	S1.001	3	54.7	1.375	1.180	1.1478	
960 minute winter	3	S1.002	4	4.8	0.387	0.062	2.7699	
960 minute winter	4	S1.003	5	13.8	0.798	0.136	0.4201	
960 minute winter	5	S1.004	6	13.4	0.600	0.076	3.1603	
960 minute winter	6	S1.005	7	-28.8	0.327	-0.087	4.8336	
960 minute winter	7	S1.006	8	-25.1	0.246	-0.076	7.2684	
960 minute winter	8	S1.007	11	17.3	0.181	0.054	7.6058	
960 minute winter	9	S2.000	10	5.9	1.215	0.048	0.2760	
960 minute winter	10	S2.001	11	-20.8	-0.131	-0.078	2.2941	
960 minute winter	11	Hydro-Brake®	32	3.7				
15 minute summer	12	S3.000	13	-12.5	-0.818	-0.866	0.9250	
15 minute summer	12	S9.000	35	9.9	0.620	0.692	0.9427	
15 minute summer	13	S3.001	14	19.9	1.135	1.380	1.1311	
15 minute summer	14	S3.002	15	25.3	1.037	0.588	0.3175	
15 minute summer	15	S3.003	16	240.8	1.520	1.138	3.3043	
15 minute summer	16	S3.004	19	656.2	2.330	1.326	16.2804	
360 minute winter	17	S4.000	19	-103.4	-0.709	-0.338	7.0352	
15 minute summer	18	S5.000	19	221.3	3.143	1.198	0.9490	
480 minute winter	19	S3.005	20	63.4	0.490	0.206	11.1710	
360 minute winter	20	S3.006	30	57.7	0.269	0.114	2.8582	
1440 minute winter	J2	S8.000A	22	-46.9	-0.666	-0.615	1.4087	
360 minute winter	22	S8.000	23	-68.5	1.265	-0.253	1.8063	
360 minute winter	23	S8.001	24	-68.5	-0.432	-0.413	4.1682	
360 minute winter	24	S8.002	30	-88.4	-0.558	-0.476	3.8019	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 93.27%

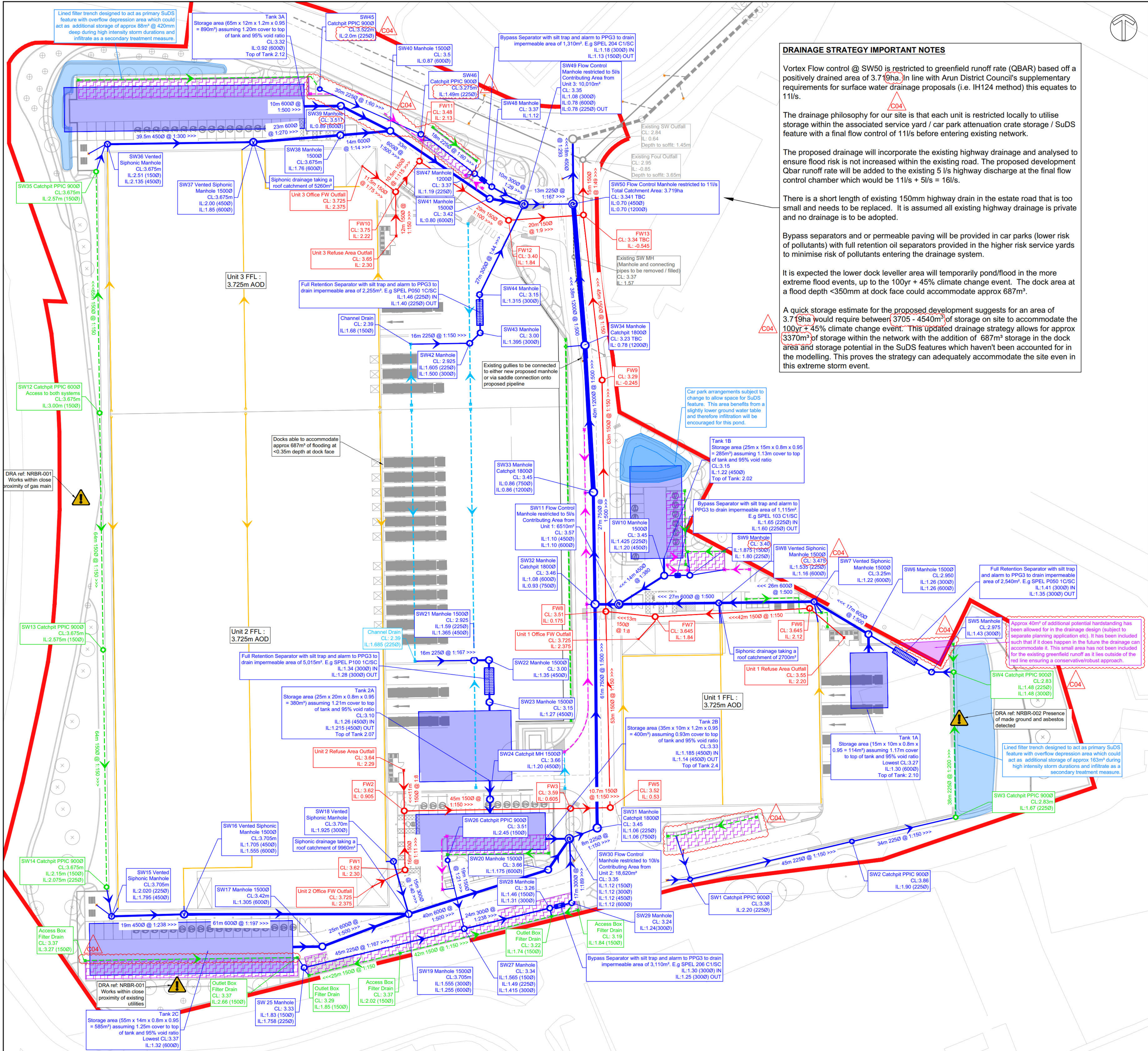
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	13	2.989	1.231	127.3	28.9897	0.0000	SURCHARGED
15 minute summer	26	13	3.095	0.645	56.5	10.5253	0.0000	SURCHARGED
15 minute summer	27	9	2.867	1.452	95.1	1.6423	0.0000	SURCHARGED
15 minute summer	28	9	2.829	1.519	134.9	1.7185	0.0000	SURCHARGED
15 minute summer	29	9	2.713	1.473	137.9	1.6659	0.0000	SURCHARGED
480 minute winter	30	312	2.592	1.472	92.1	2.6016	0.0000	SURCHARGED
240 minute summer	31	144	2.902	1.842	15.8	4.6883	0.0000	SURCHARGED
240 minute summer	32	144	2.901	1.971	26.0	5.0167	0.0000	SURCHARGED
240 minute summer	33	144	2.901	2.041	32.6	5.1935	0.0000	SURCHARGED
240 minute summer	34	144	2.900	2.120	26.1	5.3965	0.0000	SURCHARGED
15 minute summer	35	12	2.747	0.177	18.8	0.1126	0.0000	SURCHARGED
15 minute summer	36	10	2.441	0.306	130.8	0.5398	0.0000	OK
600 minute winter	37	420	2.421	0.571	40.5	1.0091	0.0000	OK
480 minute winter	38	424	2.468	0.708	411.3	1.2504	0.0000	SURCHARGED
480 minute winter	39	424	2.498	1.608	145.1	892.7818	0.0000	SURCHARGED
600 minute winter	40	420	2.702	1.832	409.8	3.2371	0.0000	SURCHARGED
480 minute winter	41	424	2.458	1.658	76.9	2.9293	0.0000	SURCHARGED
1440 minute winter	J1	870	2.391	0.786	10.8	0.8890	55.4122	FLOOD
15 minute summer	43	10	2.486	1.091	151.7	1.2342	0.0000	SURCHARGED
720 minute winter	44	510	2.443	1.128	14.1	1.2759	0.0000	SURCHARGED
15 minute summer	45	13	2.914	0.914	125.9	18.5452	0.0000	SURCHARGED
15 minute summer	46	10	2.576	1.086	73.0	0.6906	0.0000	SURCHARGED
720 minute winter	47	510	2.436	1.246	12.9	1.4097	0.0000	SURCHARGED
720 minute winter	48	510	2.434	1.314	12.8	1.4862	0.0000	SURCHARGED
720 minute winter	49	510	2.443	1.663	39.3	4.2319	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	25	S6.000	27	69.6	1.751	1.733	1.7741	
15 minute summer	26	S7.000	27	32.0	1.870	0.831	0.3360	
15 minute summer	27	S6.001	28	95.7	1.359	1.303	1.6787	
15 minute summer	28	S6.002	29	137.9	1.959	1.160	0.4310	
15 minute summer	29	S6.003	30	140.8	1.999	1.526	1.2215	
480 minute winter	30	Hydro-Brake®	31	8.2				
240 minute summer	31	S3.008	32	-15.8	0.401	-0.028	26.6766	
240 minute summer	32	S1.009	33	18.5	0.577	0.031	13.3484	
240 minute summer	33	S1.010	34	16.0	0.506	0.008	44.9444	
240 minute summer	34	S1.011	50	14.9	0.203	0.008	43.2544	
15 minute summer	35	S9.001	36	17.9	1.029	1.169	0.1331	
15 minute summer	36	S9.002	37	129.9	1.216	0.691	4.8176	
600 minute winter	37	S9.003	38	56.8	1.454	0.160	9.2012	
480 minute winter	38	S9.004	40	-380.5	-1.351	-0.120	1.1952	
480 minute winter	39	S10.000	40	-140.3	-0.562	-0.531	3.7618	
600 minute winter	40	S9.005	41	-52.5	-0.187	-0.170	9.6469	
480 minute winter	41	S9.006	49	-41.5	-0.148	-0.132	2.6571	
1440 minute winter	J1	S11.000A	43	-9.6	0.512	-0.220	0.7588	
15 minute summer	43	S11.000	44	128.4	1.823	1.316	0.7298	
720 minute winter	44	S11.001	49	14.0	0.737	0.136	1.9170	
15 minute summer	45	S12.000	46	73.0	1.836	1.075	1.1931	
15 minute summer	46	S12.001	47	73.4	1.845	1.091	0.7164	
720 minute winter	47	S12.002	48	12.8	0.746	0.224	0.2331	
720 minute winter	48	S12.003	49	12.6	0.564	0.180	0.7022	
720 minute winter	49	Hydro-Brake®	50	2.6				

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 93.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	50	144	2.900	2.200	15.5	5.5999	0.0000	SURCHARGED
15 minute winter	ExMH2	11	2.746	2.106	207.7	5.3586	0.0000	FLOOD RISK
30 minute summer	ExMH1	18	3.291	1.011	48.8	1.1433	0.0000	FLOOD RISK
30 minute summer	ExMH3	17	2.680	2.040	181.8	5.1918	2.3396	FLOOD
60 minute summer	ExMH4	30	2.615	2.105	205.9	5.3561	0.0000	FLOOD RISK
240 minute summer	ExMH5	108	2.370	1.910	113.2	4.8610	287.7444	FLOOD
30 minute summer	ExMH6	17	2.430	2.260	105.3	5.7517	5.4628	FLOOD
15 minute summer	Outfall	1	0.650	0.500	16.0	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)
240 minute summer	50	Hydro-Brake®	ExMH2	11.0				
15 minute winter	ExMH2	Ex 2	ExMH3	189.6	1.084	0.393	8.5423	
30 minute summer	ExMH1	Ex 1	ExMH2	53.1	1.336	0.731	3.2926	
30 minute summer	ExMH3	Ex 3	ExMH4	203.6	0.641	0.304	19.2989	
60 minute summer	ExMH4	Ex 4	ExMH5	209.4	0.494	0.730	39.6562	
240 minute summer	ExMH5	Ex 5	ExMH6	15.8	0.152	0.018	25.1806	
30 minute summer	ExMH6	Ex 6	Outfall	16.1	0.405	0.605	0.2978	233.9



DRAINAGE STRATEGY IMPORTANT NOTES

Vortex Flow control @ SW50 is restricted to greenfield runoff rate (QBAR) based off a positively drained area of 3.719ha. In line with Arun District Council's supplementary requirements for surface water drainage proposals (i.e. IH124 method) this equates to 11l/s.

The drainage philosophy for our site is that each unit is restricted locally to utilise storage within the associated service yard / car park attenuation crate storage / SuDS feature with a final flow control of 11l/s before entering existing network.

The proposed drainage will incorporate the existing highway drainage and analysed to ensure flood risk is not increased within the existing road. The proposed development Qbar runoff rate will be added to the existing 5 l/s highway discharge at the final flow control chamber which would be 11l/s + 5l/s = 16l/s.

There is a short length of existing 150mm highway drain in the estate road that is too small and needs to be replaced. It is assumed all existing highway drainage is private and no drainage is to be adopted.

Bypass separators and or permeable paving will be provided in car parks (lower risk of pollutants) with full retention oil separators provided in the higher risk service yards to minimise risk of pollutants entering the drainage system.

It is expected the lower dock leveller area will temporarily pond/flood in the more extreme flood events, up to the 100yr + 45% climate change event. The dock area at a flood depth <350mm at dock face could accommodate approx 687m³.

A quick storage estimate for the proposed development suggests for an area of 3.719ha would require between 3705 - 4540m³ of storage on site to accommodate the 100yr + 45% climate change event. This updated drainage strategy allows for approx 3370m³ of storage within the network with the addition of 687m³ storage in the dock area and storage potential in the SuDS features which haven't been accounted for in the modelling. This proves the strategy can adequately accommodate the site even in this extreme storm event.

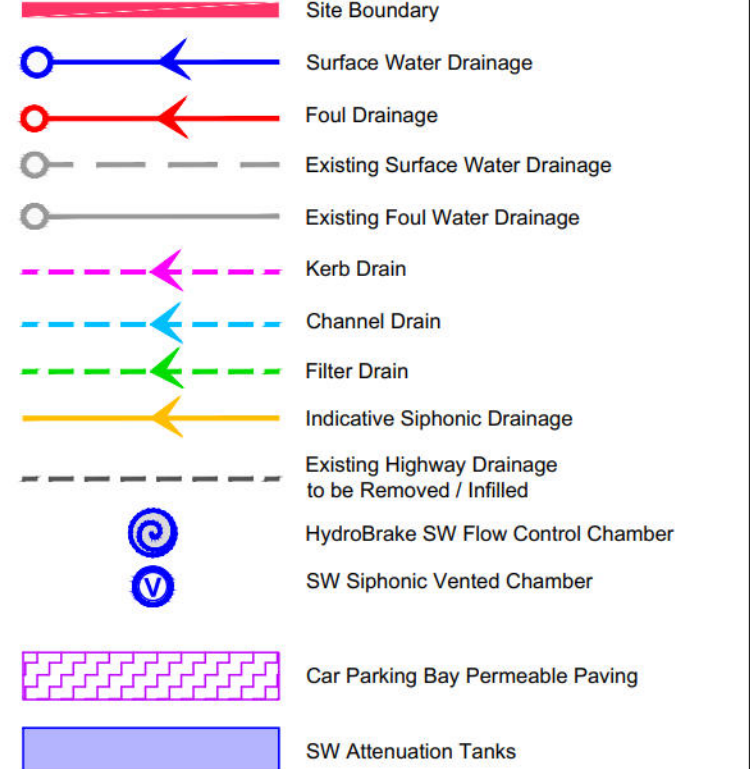
Drainage Notes

- All adoptable surface and foul water drainage works (including connections to the Public Sewers) to be carried out in strict accordance with the 'Sewer Sector Guidance' and any specific requirements of the adopting authority.
- All adoptable highway drainage works to be carried out in strict accordance with the Local Highway Authority requirements and the DTT MCHW Specification for Highway Works.
- All private drainage works are to be carried out in accordance with Building Regulations Part H, BS EN 752, the Civil Engineering Specification for the Water Industry and, where provided, the BWB Drainage Specification.
- Where applicable the contractor shall allow free and full access to the drainage works for the local authority, highway authority, drainage authority or the overseeing organisation.
- The Contractor shall check the condition of the existing drainage and ensure it is structurally sound and free from blockages / obstructions. Where necessary the Contractor is to replace and/or undertake remedial works on defective drainage. All drainage is to be cleaned by jetting, removing all debris from site to an appropriately licensed tip.
- The exact position, level, line, size and use of existing drainage is to be confirmed on site. Any discrepancies to be reported to the engineer prior to the commencement of works.
- For new connections to existing manholes, existing benching is to be broken out and reformed to suit. Concrete/brick surround to be made good.
- All temporary works associated with the construction of the drainage works shall be the responsibility of the contractor, including the protection of any uncovered/shallow pipework against construction traffic.
- The Contractor is responsible for obtaining and paying for all necessary permissions to enable construction of the works to be undertaken, including but not limited to licences for street works and connections to existing sewers. This includes Section 108 applications when connecting directly or indirectly to the public sewerage network (complete application to be made at least 3 weeks prior to the planned outfall construction works).
- Any damage caused to existing footways, roads or other third party property to be made good.
- Under roads and external paved areas all materials within 450mm of finished levels to be non-frost susceptible. Reinstatements shall be undertaken in accordance with the BWB standard detail.
- All proposed chamber covers are to be marked permanently with "SWS" (or equiv.) on surface water sewers and "FWS" (or equiv.) on foul sewers. All covers to be in accordance with BS EN 124.
- Unless noted otherwise, all lateral connections are to be installed with level soffits to the diameters and gradients shown on the layout drawing. Any pipe bends should be provided to suit the direction of flow & no pipework should be downsized in the direction of flow.
- The number and location of all RWPs is shown indicatively only. To be confirmed by Architect / M&E contractor prior to commencement of works.
- Foul water 'pop up positions' are shown indicatively only, to be confirmed by the Architect / M&E contractor prior to commencement of works. Refer to Architect plans for setting out of internal foul pop up positions.
- All RWPs and SVPs to be fitted with rodable access plates. All foul drains to have rodable access.
- Above ground drainage details to be designed/confirmed by the Architect/M&E contractor, including ventilation of the foul drainage system.
- Proposed drainage passing through new foundations to be sleeved with cast-in oversized pipework.
- All specialist/proprietary products such as separators, attenuation tanks, channel drains, soakways, package pumping station and water treatment units to be installed as per the manufacturer's installation details and specifications.

Notes

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- This drawing is to be read in conjunction with BWB drawings: 243912-BWB-EXT-XX-D-C-0001_Civil Engineering Notes, 243912-BWB-EXT-XX-D-C-0500_Drainage Catchment Plan, 243912-BWB-EXT-XX-D-C-0560_Drainage Construction Details Sheet 1 & 243912-BWB-EXT-XX-D-C-0560_Drainage Construction Details Sheet 2
- For details of approved FRA including original drainage strategy please refer to: Oldlands Farm Phase 3 FRA & DS dated Dec 2022.
- For the corresponding hydraulic model refer to BWB Report: 243912-BWB-EXT-XX-T-C-0500-[A4-C06] Drainage Hydraulic Report

Key Plan



Important CDM / H&S Notes

- For more information of specified hazard refer to BWB Designers Risk Assessment: 243912-BWB-EXT-XX-HS-C-0001
- Any construction personnel including operatives intending to construct the designs shown on this drawing should ensure that they have been regularly and thoroughly briefed by the principal Contractor on all health and safety matters and have had sight of:
- The full Designers and Contractors risk assessments and risk registers.
 - The developed construction health and safety plan.
 - The Contractors construction method statements.

Hazards that are obvious to a competent Contractor are not shown, as are every day and low risk hazards.

C04	18.09.25	Layout updated to suit masterplan changes.	DH	TAJ
C03	10.09.25	Layout updated to suit masterplan changes. Additional SuDS features added. Pipe sizes and Chambers adjusted.	DH	TAJ
C02	22.08.25	Pipe 1.010 & 1.011 up sized to 1200Ø	DH	DH
C01	20.12.24	Issued for tender	DH	TAJ
P02	29.11.24	Issued for comment	DH	TAJ
P01	11.11.24	Preliminary Issue	DH	TAJ

Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

BWB
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Client: **PANATTONI**

Project Title: **Newlands Road, Bognor Regis**

Drawing Title: **Drainage Layout**

Drawn: J.Arnold
Reviewed: T.Jones
BWB Ref: 243912
Date: 08.11.24
Scale@A1: 1:500

Project - Originator - Zone - Level - Type - Role - Number
243912-BWB-EXT-XX-D-C-0500

Status: **A4**
Rev: **C04**



Flow control chamber to be installed with a Vortex Flow Control restricted back to 16l/s

- ## Key
- | | |
|---|---|
|  | Proposed Development Site Boundary |
|  | Existing Highway Drainage Catchment (0.606ha) |
|  | Existing Highway Drainage Catchment with Proposed Development (0.594ha) |
|  | Positively Drained Impermeable Catchment (3.66tha) |
|  | Positively Drained Landscaping Catchment (0.222tha) |
- ∴ The total positively drained area has been based off a combination of 100% of impermeable areas and 25% for positively drained landscaping area to give a total catchment area of $(3.664 + (0.222 \times 0.25)) = \mathbf{3.719ha}$

This sketch has been produced to demonstrate the drainage philosophy behind the proposed development.

The proposed development will be restricted back to Qbar greenfield runoff rates calculated in line with ARUM supplementary requirements for surface water drainage proposals (i.e. I1H24 method).

The proposed drainage will incorporate the existing highway drainage and analysed to ensure flood risk is not increased within the existing road. The proposed development Qbar runoff rate will be added to the existing 5 l/s highway discharge at the final flow control chamber.

Issues & Revisions

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☐ Manchester | 0161 233 4260
☒ Nottingham | 0115 924 1100

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Client _____

PANATTONI

Project Title

Newlands Road, Bognor Regis

Drawing Title

**Proposed Development
Discharge Rate**

Drawn:	D.Holmes		Reviewed:	T.Jones	
BWB Ref:	243912	Date:	Sept 25	Scale@A1:	1:500

For Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
243912-BWB-EXT-XX-G-C-0536	S2	P02