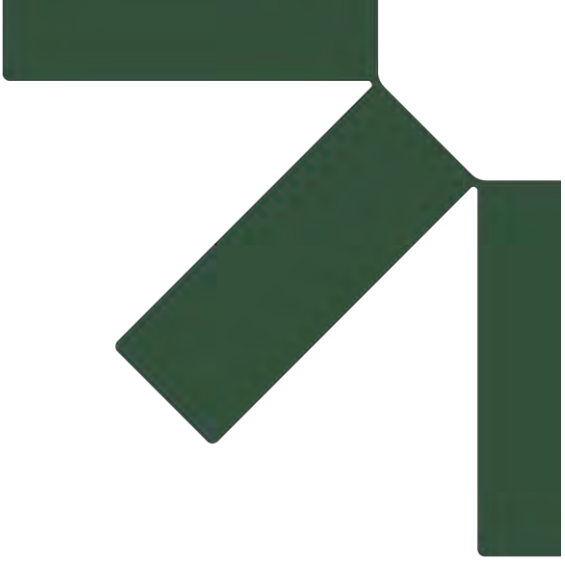




Appendix F Surface Water Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Hamza El-Adnany
Site name:	Roundwood
Site location:	Stevenage

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

Site Details

Latitude:	51.93407° N
Longitude:	0.18089° W
Reference:	2985284232
Date:	Sep 09 2021 11:19

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	8.14
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Methodology

Q _{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.596
Q _{MED} (l/s):	
Q _{BAR} / Q _{MED} factor:	1.12

Hydrological characteristics

	Default	Edited
SAAR (mm):	628	628
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Growth curve factor 200 years:	4.21	4.21

Notes

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

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

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

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

(3) Is $SPR/SPRHOST \leq 0.3$?

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

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):		14.29
1 in 1 year (l/s):		12.43
1 in 30 years (l/s):		35.01
1 in 100 year (l/s):		50.88
1 in 200 years (l/s):		60.17

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



Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	0.750	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Depth (m)
✓	Basin 04			141.900	1.950
✓	Basin 03		5.00	141.900	1.800
✓	Basin 02			141.900	1.950
✓	SW10 (FC)	0.047	5.00	141.900	2.065
✓	SW11			141.700	1.959
✓	SW12			142.000	2.544
✓	EXManhole			141.030	2.000
✓	SW14	0.049	5.00	142.650	1.425
✓	SW01	0.047	5.00	143.400	1.425
✓	SW02	0.071	5.00	143.220	1.575
✓	SW03	0.169	5.00	143.150	1.853
✓	SW04	0.081	5.00	143.000	1.877
✓	SW05	0.072	5.00	142.700	1.907
✓	SW06	0.050	5.00	142.568	1.907
✓	SW07	0.028	5.00	142.522	1.907
✓	SW08	0.068	5.00	142.246	1.725
✓	Basin 01			142.000	1.500
✓	1	0.022	5.00	141.700	1.113
✓	2			141.700	1.171
✓	3			141.700	1.219
✓	4			141.800	1.466
✓	5			141.900	1.586
✓	6			141.900	1.611
✓	7			141.750	1.604
✓	8			141.750	1.653
✓	9			141.750	1.674
✓	10			141.700	1.649
✓	SW09	0.048	5.00	141.650	1.654
✓	SW15	0.030	5.00	142.600	1.455
✓	SW16	0.011	5.00	142.750	1.850
✓	SW17	0.020	5.00	142.359	1.499
✓	SW83	0.010	5.00	142.950	1.778
✓	SW19	0.054	5.00	142.600	1.561
✓	SW20	0.032	5.00	142.450	1.507
✓	SW21	0.050	5.00	142.200	1.424
✓	SW22	0.030	5.00	142.122	1.424
✓	SW18	0.025	5.00	142.704	1.350
✓	SW23	0.048	5.00	142.450	1.425
✓	SW24	0.046	5.00	142.258	1.425
✓	SW25	0.014	5.00	142.213	1.425
✓	SW26	0.071	5.00	142.450	1.425
✓	SW27	0.148	5.00	142.262	1.500
✓	SW28	0.032	5.00	142.185	1.500
✓	SW29	0.058	5.00	142.095	1.500
✓	SW30	0.016	5.00	141.878	1.350
✓	SW31			141.821	1.350
✓	11			143.900	2.784
✓	12			143.850	2.840
✓	13			143.750	2.813
✓	14			143.650	2.739
✓	SW37	0.157	5.00	143.550	2.660
✓	16			143.450	2.581
✓	17			143.000	2.286
✓	SW38	0.089	5.00	142.950	2.317
✓	19			143.200	2.573
✓	20			142.550	2.095
✓	21			142.100	1.764
✓	SW32	0.061	5.00	143.600	1.425
✓	SW33	0.009	5.00	143.500	1.502
✓	SW34	0.054	5.00	143.650	1.778
✓	SW35	0.094	5.00	143.850	2.133
✓	SW36	0.016	5.00	143.900	2.243
✓	SW41	0.036	5.00	143.400	1.575
✓	SW42	0.061	5.00	143.400	1.789
✓	SW43	0.005	5.00	143.400	1.837
✓	SW44	0.021	5.00	143.550	2.082
✓	SW45	0.036	5.00	143.600	2.188
✓	SW46	0.059	5.00	143.800	2.479
✓	SW47	0.104	5.00	143.400	1.500
✓	SW48	0.080	5.00	143.500	1.852
✓	SW39	0.030	5.00	142.175	1.875
✓	SW40	0.116	5.00	142.000	2.000
✓	SW49	0.029	5.00	143.620	1.500



Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Depth (m)
✓	SW50	0.100	5.00	143.424	1.500
✓	SW51	0.039	5.00	143.300	1.602
✓	SW52	0.059	5.00	143.200	1.578
✓	SW53	0.038	5.00	143.100	1.705
✓	SW54	0.065	5.00	143.050	1.746
✓	SW55	0.043	5.00	143.000	1.763
✓	SW56	0.076	5.00	142.850	1.805
✓	SW57	0.046	5.00	142.850	1.912
✓	SW58	0.122	5.00	143.050	2.206
✓	SW59	0.010	5.00	142.950	2.156
✓	SW60	0.040	5.00	142.800	2.050
✓	SW61	0.034	5.00	142.700	1.983
✓	SW62	0.126	5.00	142.500	1.834
✓	SW63	0.059	5.00	142.500	1.885
✓	SW64	0.067	5.00	142.950	1.625
✓	SW65	0.058	5.00	142.925	1.766
✓	SW66	0.062	5.00	142.264	1.366
✓	SW67	0.038	5.00	142.215	1.441
✓	SW68	0.025	5.00	142.132	1.500
✓	SW69	0.038	5.00	143.478	1.425
✓	SW70	0.052	5.00	143.352	1.425
✓	SW71	0.039	5.00	143.152	1.425
✓	SW72	0.028	5.00	143.081	1.500
✓	SW73	0.055	5.00	142.950	1.425
✓	SW74	0.066	5.00	142.900	1.425
✓	SW75	0.117	5.00	142.789	1.591
✓	SW76	0.069	5.00	142.642	1.425
✓	SW77	0.050	5.00	142.580	1.454
✓	SW78	0.039	5.00	142.379	1.350
✓	SW79	0.051	5.00	142.866	1.350
✓	SW80	0.009	5.00	142.818	1.425
✓	SW81	0.023	5.00	142.738	1.425
✓	SW82	0.033	5.00	142.950	1.753
✓	SW84	0.051	5.00	143.850	1.425
✓	SW85	0.034	5.00	143.600	1.350
✓	SW86	0.049	5.00	143.600	1.350
✓	SW87	0.122	5.00	143.450	1.500
✓	SW88	0.016	5.00	143.200	1.350
✓	SW89	0.042	5.00	143.100	1.695
✓	SW91	0.089	5.00	143.200	1.350
✓	SW90	0.091	5.00	143.100	1.350
✓	SW92	0.180	5.00	142.712	1.425
✓	SW93	0.034	5.00	142.500	1.350
✓	SW94	0.047	5.00	142.244	1.350
✓	SW95	0.047	5.00	142.424	1.425
✓	SW13			141.250	1.912
✓	Tank 01		5.00	142.500	1.400

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.020	15.618	167.0	225	1 STANDARD	141.900	139.835	1.840	141.700	139.741	1.734
1.021	47.653	167.0	225	1 STANDARD	141.700	139.741	1.734	142.000	139.456	2.319
1.022	19.730	167.0	225	1 STANDARD	142.000	139.456	2.319	141.250	139.338	1.687
1.019	20.057	500.0	600	1 STANDARD	141.900	139.950	1.350	141.900	139.910	1.390
31.000	14.869	78.3	600	1 STANDARD	141.900	140.100	1.200	141.900	139.910	1.390
15.019	12.196	106.1	675	1 STANDARD	141.900	139.950	1.275	141.900	139.835	1.390
2.000	30.129	167.0	225	1 STANDARD	143.400	141.975	1.200	143.220	141.795	1.200
1.002	54.661	200.0	375	1 STANDARD	143.220	141.645	1.200	143.150	141.372	1.403
1.003	34.896	200.0	450	1 STANDARD	143.150	141.297	1.403	143.000	141.123	1.427
1.004	51.030	200.1	450	1 STANDARD	143.000	141.123	1.427	142.700	140.868	1.382
1.005	39.638	300.3	525	1 STANDARD	142.700	140.793	1.382	142.568	140.661	1.382
1.006	13.769	300.0	525	1 STANDARD	142.568	140.661	1.382	142.522	140.615	1.382
1.007	18.343	195.1	525	1 STANDARD	142.522	140.615	1.382	142.246	140.521	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.020	SW10 (FC)	1500	Manhole	1 STANDARD	SW11	1350	Manhole	1 STANDARD
1.021	SW11	1350	Manhole	1 STANDARD	SW12	1350	Manhole	1 STANDARD
1.022	SW12	1350	Manhole	1 STANDARD	SW13	1350	Manhole	1 STANDARD
1.019	Basin 02		Junction		SW10 (FC)	1500	Manhole	1 STANDARD
31.000	Basin 03		Junction		SW10 (FC)	1500	Manhole	1 STANDARD
15.019	Basin 04		Junction		SW10 (FC)	1500	Manhole	1 STANDARD
2.000	SW01	1200	Manhole	1 STANDARD	SW02	1350	Manhole	1 STANDARD
1.002	SW02	1350	Manhole	1 STANDARD	SW03	1350	Manhole	1 STANDARD
1.003	SW03	1350	Manhole	1 STANDARD	SW04	1350	Manhole	1 STANDARD
1.004	SW04	1350	Manhole	1 STANDARD	SW05	1500	Manhole	1 STANDARD
1.005	SW05	1500	Manhole	1 STANDARD	SW06	1500	Manhole	1 STANDARD
1.006	SW06	1500	Manhole	1 STANDARD	SW07	1500	Manhole	1 STANDARD
1.007	SW07	1500	Manhole	1 STANDARD	SW08	1500	Manhole	1 STANDARD



Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
10.000	28.837	497.2	525	1 STANDARD	141.700	140.587	0.588	141.700	140.529	0.646
10.001	23.577	501.6	525	1 STANDARD	141.700	140.529	0.646	141.700	140.482	0.693
1.010	73.435	499.6	525	1 STANDARD	141.700	140.481	0.694	141.800	140.334	0.941
1.011	10.086	504.3	525	1 STANDARD	141.800	140.334	0.941	141.900	140.314	1.061
1.012	12.594	503.8	525	1 STANDARD	141.900	140.314	1.061	141.900	140.289	1.086
1.013	71.281	498.5	525	1 STANDARD	141.900	140.289	1.086	141.750	140.146	1.079
1.014	24.710	504.3	525	1 STANDARD	141.750	140.146	1.079	141.750	140.097	1.128
1.015	10.447	497.5	525	1 STANDARD	141.750	140.097	1.128	141.750	140.076	1.149
1.016	12.387	495.5	525	1 STANDARD	141.750	140.076	1.149	141.700	140.051	1.124
1.017	27.566	501.2	525	1 STANDARD	141.700	140.051	1.124	141.650	139.996	1.129
1.018	7.314	159.0	525	1 STANDARD	141.650	139.996	1.129	141.900	139.950	1.425
1.008	10.656	507.4	525	1 STANDARD	142.246	140.521	1.200	142.000	140.500	0.975
1.009	9.600	500.0	525	1 STANDARD	142.000	140.500	0.975	141.700	140.481	0.694
9.000	13.402	167.0	225	1 STANDARD	142.650	141.225	1.200	142.600	141.145	1.230
8.005	9.221	233.1	300	1 STANDARD	142.750	140.900	1.550	142.359	140.860	1.199
8.006	26.466	232.2	300	1 STANDARD	142.359	140.860	1.199	142.246	140.746	1.200
8.004	26.850	136.3	225	1 STANDARD	142.950	141.172	1.553	142.750	140.975	1.550
11.001	16.029	167.0	225	1 STANDARD	142.600	141.039	1.336	142.450	140.943	1.282
11.002	27.921	167.0	225	1 STANDARD	142.450	140.943	1.282	142.200	140.776	1.199
11.003	13.000	167.0	225	1 STANDARD	142.200	140.776	1.199	142.122	140.698	1.199
11.004	13.804	167.0	225	1 STANDARD	142.122	140.698	1.199	141.900	140.615	1.060
11.000	24.000	100.0	150	1 STANDARD	142.704	141.354	1.200	142.600	141.114	1.336
12.000	32.054	167.0	225	1 STANDARD	142.450	141.025	1.200	142.258	140.833	1.200
12.001	7.475	167.0	225	1 STANDARD	142.258	140.833	1.200	142.213	140.788	1.200
12.002	7.538	37.9	225	1 STANDARD	142.213	140.788	1.200	141.900	140.589	1.086
13.000	31.439	167.0	225	1 STANDARD	142.450	141.025	1.200	142.262	140.837	1.200
13.001	18.000	234.0	300	1 STANDARD	142.262	140.762	1.200	142.185	140.685	1.200
13.002	21.000	234.0	300	1 STANDARD	142.185	140.685	1.200	142.095	140.595	1.200
13.003	9.158	40.9	300	1 STANDARD	142.095	140.595	1.200	141.750	140.371	1.079
14.000	5.705	100.0	150	1 STANDARD	141.878	140.528	1.200	141.821	140.471	1.200
14.001	12.962	100.0	150	1 STANDARD	141.821	140.471	1.200	141.650	140.341	1.159
21.005	52.780	497.9	525	1 STANDARD	143.900	141.116	2.259	143.850	141.010	2.315
21.006	36.322	497.6	525	1 STANDARD	143.850	141.010	2.315	143.750	140.937	2.288
21.007	13.160	500.0	525	1 STANDARD	143.750	140.937	2.288	143.650	140.911	2.214
21.008	10.560	502.9	525	1 STANDARD	143.650	140.911	2.214	143.550	140.890	2.135
21.009	10.559	502.8	525	1 STANDARD	143.550	140.890	2.135	143.450	140.869	2.056
21.010	77.262	498.5	525	1 STANDARD	143.450	140.869	2.056	143.000	140.714	1.761
21.011	3.000	500.0	525	1 STANDARD	143.000	140.714	1.761	142.950	140.708	1.717

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
10.000	1	1500	Manhole	1 STANDARD	2	1500	Manhole	1 STANDARD
10.001	2	1500	Manhole	1 STANDARD	3	1500	Manhole	1 STANDARD
1.010	3	1500	Manhole	1 STANDARD	4	1500	Manhole	1 STANDARD
1.011	4	1500	Manhole	1 STANDARD	5	1500	Manhole	1 STANDARD
1.012	5	1500	Manhole	1 STANDARD	6	1500	Manhole	1 STANDARD
1.013	6	1500	Manhole	1 STANDARD	7	1500	Manhole	1 STANDARD
1.014	7	1500	Manhole	1 STANDARD	8	1500	Manhole	1 STANDARD
1.015	8	1500	Manhole	1 STANDARD	9	1500	Manhole	1 STANDARD
1.016	9	1500	Manhole	1 STANDARD	10	1500	Manhole	1 STANDARD
1.017	10	1500	Manhole	1 STANDARD	SW09	1500	Manhole	1 STANDARD
1.018	SW09	1500	Manhole	1 STANDARD	Basin 02		Junction	
1.008	SW08	1500	Manhole	1 STANDARD	Basin 01		Junction	
1.009	Basin 01		Junction		3	1500	Manhole	1 STANDARD
9.000	SW14	1200	Manhole	1 STANDARD	SW15	1200	Manhole	1 STANDARD
8.005	SW16	1350	Manhole	1 STANDARD	SW17	1200	Manhole	1 STANDARD
8.006	SW17	1200	Manhole	1 STANDARD	SW08	1500	Manhole	1 STANDARD
8.004	SW83	1350	Manhole	1 STANDARD	SW16	1350	Manhole	1 STANDARD
11.001	SW19	1350	Manhole	1 STANDARD	SW20	1350	Manhole	1 STANDARD
11.002	SW20	1350	Manhole	1 STANDARD	SW21	1200	Manhole	1 STANDARD
11.003	SW21	1200	Manhole	1 STANDARD	SW22	1200	Manhole	1 STANDARD
11.004	SW22	1200	Manhole	1 STANDARD	5	1500	Manhole	1 STANDARD
11.000	SW18	1200	Manhole	1 STANDARD	SW19	1350	Manhole	1 STANDARD
12.000	SW23	1200	Manhole	1 STANDARD	SW24	1200	Manhole	1 STANDARD
12.001	SW24	1200	Manhole	1 STANDARD	SW25	1200	Manhole	1 STANDARD
12.002	SW25	1200	Manhole	1 STANDARD	6	1500	Manhole	1 STANDARD
13.000	SW26	1200	Manhole	1 STANDARD	SW27	1200	Manhole	1 STANDARD
13.001	SW27	1200	Manhole	1 STANDARD	SW28	1200	Manhole	1 STANDARD
13.002	SW28	1200	Manhole	1 STANDARD	SW29	1200	Manhole	1 STANDARD
13.003	SW29	1200	Manhole	1 STANDARD	7	1500	Manhole	1 STANDARD
14.000	SW30	1200	Manhole	1 STANDARD	SW31	1200	Manhole	1 STANDARD
14.001	SW31	1200	Manhole	1 STANDARD	SW09	1500	Manhole	1 STANDARD
21.005	11	1500	Manhole	1 STANDARD	12	1500	Manhole	1 STANDARD
21.006	12	1500	Manhole	1 STANDARD	13	1500	Manhole	1 STANDARD
21.007	13	1500	Manhole	1 STANDARD	14	1500	Manhole	1 STANDARD
21.008	14	1500	Manhole	1 STANDARD	SW37	1500	Manhole	1 STANDARD
21.009	SW37	1500	Manhole	1 STANDARD	16	1500	Manhole	1 STANDARD
21.010	16	1500	Manhole	1 STANDARD	17	1500	Manhole	1 STANDARD
21.011	17	1500	Manhole	1 STANDARD	SW38	1500	Manhole	1 STANDARD



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)
21.012	3.000	500.0	600	1 STANDARD	142.950	140.633	1.717	143.200	140.627	1.973
21.013	48.273	497.7	600	1 STANDARD	143.200	140.627	1.973	142.550	140.530	1.420
15.015	59.727	501.9	675	1 STANDARD	142.550	140.455	1.420	142.100	140.336	1.089
21.000	17.017	167.0	225	1 STANDARD	143.600	142.175	1.200	143.500	142.073	1.202
21.001	21.040	167.0	300	1 STANDARD	143.500	141.998	1.202	143.650	141.872	1.478
21.002	25.918	167.0	300	1 STANDARD	143.650	141.872	1.478	143.850	141.717	1.833
21.003	10.014	167.4	300	1 STANDARD	143.850	141.717	1.833	143.900	141.657	1.943
21.004	9.962	31.5	300	1 STANDARD	143.900	141.657	1.943	143.900	141.341	2.259
23.000	23.184	167.0	225	1 STANDARD	143.400	141.825	1.350	143.400	141.686	1.489
23.001	8.010	167.0	300	1 STANDARD	143.400	141.611	1.489	143.400	141.563	1.537
23.002	19.132	200.9	300	1 STANDARD	143.400	141.563	1.537	143.550	141.468	1.782
23.003	11.213	200.2	300	1 STANDARD	143.550	141.468	1.782	143.600	141.412	1.888
23.004	18.170	199.7	300	1 STANDARD	143.600	141.412	1.888	143.800	141.321	2.179
23.005	5.892	68.5	300	1 STANDARD	143.800	141.321	2.179	143.850	141.235	2.315
26.000	29.628	167.0	300	1 STANDARD	143.400	141.900	1.200	143.500	141.723	1.477
26.001	44.043	72.4	375	1 STANDARD	143.500	141.648	1.477	143.550	141.040	2.135
15.016	17.754	493.2	675	1 STANDARD	142.100	140.336	1.089	142.175	140.300	1.200
15.017	32.000	106.7	675	1 STANDARD	142.175	140.300	1.200	142.000	140.000	1.325
15.018	8.795	175.9	675	1 STANDARD	142.000	140.000	1.325	141.900	139.950	1.275
15.000	32.754	167.0	300	1 STANDARD	143.620	142.120	1.200	143.424	141.924	1.200
15.001	25.179	167.0	300	1 STANDARD	143.424	141.924	1.200	143.300	141.773	1.227
15.002	15.249	200.0	375	1 STANDARD	143.300	141.698	1.227	143.200	141.622	1.203
15.003	30.446	200.0	375	1 STANDARD	143.200	141.622	1.203	143.100	141.470	1.255
15.004	27.261	300.0	450	1 STANDARD	143.100	141.395	1.255	143.050	141.304	1.296
15.005	20.097	300.0	450	1 STANDARD	143.050	141.304	1.296	143.000	141.237	1.313
15.006	35.001	300.0	450	1 STANDARD	143.000	141.237	1.313	142.850	141.120	1.280
15.007	32.001	300.0	525	1 STANDARD	142.850	141.045	1.280	142.850	140.938	1.387
15.008	28.152	300.0	525	1 STANDARD	142.850	140.938	1.387	143.050	140.844	1.681
15.009	19.885	397.7	525	1 STANDARD	143.050	140.844	1.681	142.950	140.794	1.631
15.010	17.679	400.0	525	1 STANDARD	142.950	140.794	1.631	142.800	140.750	1.525
15.011	13.116	400.0	525	1 STANDARD	142.800	140.750	1.525	142.700	140.717	1.458
15.012	20.369	400.0	525	1 STANDARD	142.700	140.717	1.458	142.500	140.666	1.309
15.013	22.989	450.8	525	1 STANDARD	142.500	140.666	1.309	142.500	140.615	1.360
15.014	3.155	315.5	525	1 STANDARD	142.500	140.615	1.360	142.550	140.605	1.420
28.000	27.653	166.6	225	1 STANDARD	142.950	141.325	1.400	142.925	141.159	1.541
28.001	43.600	167.0	225	1 STANDARD	142.925	141.159	1.541	142.264	140.898	1.141
28.002	8.265	167.0	225	1 STANDARD	142.264	140.898	1.141	142.215	140.849	1.141
28.003	23.631	166.4	300	1 STANDARD	142.215	140.774	1.141	142.132	140.632	1.200
28.004	32.999	128.4	300	1 STANDARD	142.132	140.632	1.200	142.000	140.375	1.325

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
21.012	SW38	1500	Manhole	1 STANDARD	19	1500	Manhole	1 STANDARD
21.013	19	1500	Manhole	1 STANDARD	20	1500	Manhole	1 STANDARD
15.015	20	1500	Manhole	1 STANDARD	21	1500	Manhole	1 STANDARD
21.000	SW32	1200	Manhole	1 STANDARD	SW33	1350	Manhole	1 STANDARD
21.001	SW33	1350	Manhole	1 STANDARD	SW34	1350	Manhole	1 STANDARD
21.002	SW34	1350	Manhole	1 STANDARD	SW35	1350	Manhole	1 STANDARD
21.003	SW35	1350	Manhole	1 STANDARD	SW36	1350	Manhole	1 STANDARD
21.004	SW36	1350	Manhole	1 STANDARD	11	1500	Manhole	1 STANDARD
23.000	SW41	1350	Manhole	1 STANDARD	SW42	1350	Manhole	1 STANDARD
23.001	SW42	1350	Manhole	1 STANDARD	SW43	1350	Manhole	1 STANDARD
23.002	SW43	1350	Manhole	1 STANDARD	SW44	1350	Manhole	1 STANDARD
23.003	SW44	1350	Manhole	1 STANDARD	SW45	1350	Manhole	1 STANDARD
23.004	SW45	1350	Manhole	1 STANDARD	SW46	1350	Manhole	1 STANDARD
23.005	SW46	1350	Manhole	1 STANDARD	12	1500	Manhole	1 STANDARD
26.000	SW47	1200	Manhole	1 STANDARD	SW48	1350	Manhole	1 STANDARD
26.001	SW48	1350	Manhole	1 STANDARD	SW37	1500	Manhole	1 STANDARD
15.016	21	1500	Manhole	1 STANDARD	SW39	1500	Manhole	1 STANDARD
15.017	SW39	1500	Manhole	1 STANDARD	SW40	1500	Manhole	1 STANDARD
15.018	SW40	1500	Manhole	1 STANDARD	Basin 04	Junction		
15.000	SW49	1200	Manhole	1 STANDARD	SW50	1200	Manhole	1 STANDARD
15.001	SW50	1200	Manhole	1 STANDARD	SW51	1350	Manhole	1 STANDARD
15.002	SW51	1350	Manhole	1 STANDARD	SW52	1350	Manhole	1 STANDARD
15.003	SW52	1350	Manhole	1 STANDARD	SW53	1350	Manhole	1 STANDARD
15.004	SW53	1350	Manhole	1 STANDARD	SW54	1350	Manhole	1 STANDARD
15.005	SW54	1350	Manhole	1 STANDARD	SW55	1350	Manhole	1 STANDARD
15.006	SW55	1350	Manhole	1 STANDARD	SW56	1500	Manhole	1 STANDARD
15.007	SW56	1500	Manhole	1 STANDARD	SW57	1500	Manhole	1 STANDARD
15.008	SW57	1500	Manhole	1 STANDARD	SW58	1500	Manhole	1 STANDARD
15.009	SW58	1500	Manhole	1 STANDARD	SW59	1500	Manhole	1 STANDARD
15.010	SW59	1500	Manhole	1 STANDARD	SW60	1500	Manhole	1 STANDARD
15.011	SW60	1500	Manhole	1 STANDARD	SW61	1500	Manhole	1 STANDARD
15.012	SW61	1500	Manhole	1 STANDARD	SW62	1500	Manhole	1 STANDARD
15.013	SW62	1500	Manhole	1 STANDARD	SW63	1500	Manhole	1 STANDARD
15.014	SW63	1500	Manhole	1 STANDARD	20	1500	Manhole	1 STANDARD
28.000	SW64	1200	Manhole	1 STANDARD	SW65	1350	Manhole	1 STANDARD
28.001	SW65	1350	Manhole	1 STANDARD	SW66	1200	Manhole	1 STANDARD
28.002	SW66	1200	Manhole	1 STANDARD	SW67	1200	Manhole	1 STANDARD
28.003	SW67	1200	Manhole	1 STANDARD	SW68	1200	Manhole	1 STANDARD
28.004	SW68	1200	Manhole	1 STANDARD	SW40	1500	Manhole	1 STANDARD

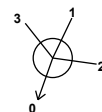


Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	20.978	167.0	225	1 STANDARD	143.478	142.053	1.200	143.352	141.927	1.200
1.001	22.012	167.0	225	1 STANDARD	143.352	141.927	1.200	143.220	141.795	1.200
3.000	11.861	167.0	225	1 STANDARD	143.152	141.727	1.200	143.081	141.656	1.200
3.001	15.800	117.9	300	1 STANDARD	143.081	141.581	1.200	143.150	141.447	1.403
4.000	15.393	87.0	225	1 STANDARD	142.950	141.525	1.200	143.000	141.348	1.427
5.000	30.248	150.0	225	1 STANDARD	142.900	141.475	1.200	142.789	141.273	1.291
5.001	14.759	82.0	300	1 STANDARD	142.789	141.198	1.291	142.700	141.018	1.382
6.000	15.193	167.0	225	1 STANDARD	142.642	141.217	1.200	142.580	141.126	1.229
6.001	5.610	167.0	225	1 STANDARD	142.580	141.126	1.229	142.700	141.092	1.383
7.000	3.929	100.0	150	1 STANDARD	142.379	141.029	1.200	142.522	140.990	1.382
8.000	4.821	100.0	150	1 STANDARD	142.866	141.516	1.200	142.818	141.468	1.200
8.001	13.287	167.0	225	1 STANDARD	142.818	141.393	1.200	142.738	141.313	1.200
8.002	19.394	167.0	225	1 STANDARD	142.738	141.313	1.200	142.950	141.197	1.528
8.003	4.169	167.0	225	1 STANDARD	142.950	141.197	1.528	142.950	141.172	1.553
22.000	21.467	33.9	225	1 STANDARD	143.850	142.425	1.200	143.850	141.792	1.833
24.000	12.043	19.1	150	1 STANDARD	143.600	142.250	1.200	143.550	141.618	1.782
25.000	14.170	20.3	150	1 STANDARD	143.600	142.250	1.200	143.600	141.552	1.898
27.000	22.903	100.9	300	1 STANDARD	143.450	141.950	1.200	143.500	141.723	1.477
16.000	21.969	100.0	150	1 STANDARD	143.200	141.850	1.200	143.100	141.630	1.320
16.001	42.111	102.5	375	1 STANDARD	143.100	141.405	1.320	143.050	140.994	1.681
17.000	14.152	38.2	300	1 STANDARD	143.200	141.850	1.050	143.100	141.480	1.320
18.000	10.845	40.2	300	1 STANDARD	143.100	141.750	1.050	143.100	141.480	1.320
19.000	14.798	54.8	225	1 STANDARD	142.712	141.287	1.200	142.700	141.017	1.458
30.000	25.549	100.0	150	1 STANDARD	142.500	141.150	1.200	142.244	140.895	1.199
30.001	21.869	59.3	150	1 STANDARD	142.244	140.894	1.200	142.000	140.525	1.325
29.000	25.355	169.0	225	1 STANDARD	142.424	140.999	1.200	142.215	140.849	1.141
1.023	22.274	72.3	225	1 STANDARD	141.250	139.338	1.687	141.030	139.030	1.775
20.000	6.684	15.4	525	1 STANDARD	142.500	141.100	0.875	142.500	140.666	1.309
9.001	5.966	28.4	225	1 STANDARD	142.600	141.145	1.230	142.359	140.935	1.199

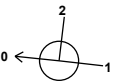
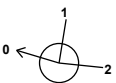
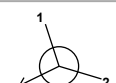
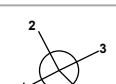
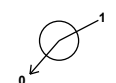
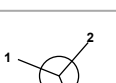
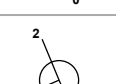
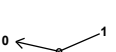
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW69	1200	Manhole	1 STANDARD	SW70	1200	Manhole	1 STANDARD
1.001	SW70	1200	Manhole	1 STANDARD	SW02	1350	Manhole	1 STANDARD
3.000	SW71	1200	Manhole	1 STANDARD	SW72	1200	Manhole	1 STANDARD
3.001	SW72	1200	Manhole	1 STANDARD	SW03	1350	Manhole	1 STANDARD
4.000	SW73	1200	Manhole	1 STANDARD	SW04	1350	Manhole	1 STANDARD
5.000	SW74	1200	Manhole	1 STANDARD	SW75	1350	Manhole	1 STANDARD
5.001	SW75	1350	Manhole	1 STANDARD	SW05	1500	Manhole	1 STANDARD
6.000	SW76	1200	Manhole	1 STANDARD	SW77	1200	Manhole	1 STANDARD
6.001	SW77	1200	Manhole	1 STANDARD	SW05	1500	Manhole	1 STANDARD
7.000	SW78	1200	Manhole	1 STANDARD	SW07	1500	Manhole	1 STANDARD
8.000	SW79	1200	Manhole	1 STANDARD	SW80	1200	Manhole	1 STANDARD
8.001	SW80	1200	Manhole	1 STANDARD	SW81	1200	Manhole	1 STANDARD
8.002	SW81	1200	Manhole	1 STANDARD	SW82	1350	Manhole	1 STANDARD
8.003	SW82	1350	Manhole	1 STANDARD	SW83	1350	Manhole	1 STANDARD
22.000	SW84	1200	Manhole	1 STANDARD	SW35	1350	Manhole	1 STANDARD
24.000	SW85	1200	Manhole	1 STANDARD	SW44	1350	Manhole	1 STANDARD
25.000	SW86	1200	Manhole	1 STANDARD	SW45	1350	Manhole	1 STANDARD
27.000	SW87	1200	Manhole	1 STANDARD	SW48	1350	Manhole	1 STANDARD
16.000	SW88	1200	Manhole	1 STANDARD	SW89	1350	Manhole	1 STANDARD
16.001	SW89	1350	Manhole	1 STANDARD	SW58	1500	Manhole	1 STANDARD
17.000	SW91	1200	Manhole	1 STANDARD	SW89	1350	Manhole	1 STANDARD
18.000	SW90	1200	Manhole	1 STANDARD	SW89	1350	Manhole	1 STANDARD
19.000	SW92	1200	Manhole	1 STANDARD	SW61	1500	Manhole	1 STANDARD
30.000	SW93	1200	Manhole	1 STANDARD	SW94	1200	Manhole	1 STANDARD
30.001	SW94	1200	Manhole	1 STANDARD	SW40	1500	Manhole	1 STANDARD
29.000	SW95	1200	Manhole	1 STANDARD	SW67	1200	Manhole	1 STANDARD
1.023	SW13	1350	Manhole	1 STANDARD	EXManhole	1350	Manhole	1 STANDARD
20.000	Tank 01		Junction		SW62	1500	Manhole	1 STANDARD
9.001	SW15	1200	Manhole	1 STANDARD	SW17	1200	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
Basin 04	525130.969	227511.445	141.900	1.950		Junction			1 0	15.018 15.019	139.950 139.950	675 675	1 STANDARD 1 STANDARD
Basin 03	525043.772	227537.970	141.900	1.800		Junction			0	31.000	140.100	600	1 STANDARD
Basin 02	525007.107	227562.666	141.900	1.950		Junction			1 0	1.018 1.019	139.950 139.950	525 600	1 STANDARD 1 STANDARD
SW10 (FC)	525037.311	227524.496	141.900	2.065	1500	Manhole	1 STANDARD		1 2 3 0	31.000 15.019 1.019 1.020	139.910 139.835 139.910 139.835	600 675 600 225	1 STANDARD 1 STANDARD 1 STANDARD 1 STANDARD

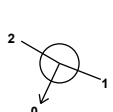
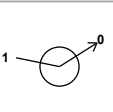
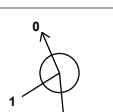
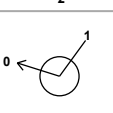
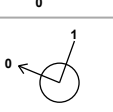
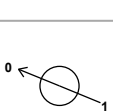
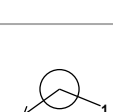
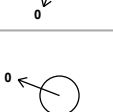
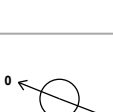
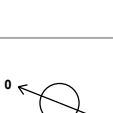
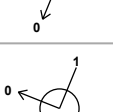
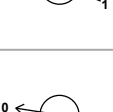


Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SW11	525032.098	227509.774	141.700	1.959	1350	Manhole	1 STANDARD	 1	1.020	139.741	225	1 STANDARD
								0	1.021	139.741	225	1 STANDARD
SW12	524985.867	227521.328	142.000	2.544	1350	Manhole	1 STANDARD	 1	1.021	139.456	225	1 STANDARD
								0	1.022	139.456	225	1 STANDARD
EXManhole	524967.824	227483.879	141.030	2.000	1350	Manhole	1 STANDARD	 1	1.023	139.030	225	1 STANDARD
SW14	525079.124	227759.059	142.650	1.425	1200	Manhole	1 STANDARD	 0	9.000	141.225	225	1 STANDARD
SW01	525287.578	227832.870	143.400	1.425	1200	Manhole	1 STANDARD	 0	2.000	141.975	225	1 STANDARD
SW02	525257.641	227836.268	143.220	1.575	1350	Manhole	1 STANDARD	 1 2	2.000 1.001	141.795 141.795	225 225	1 STANDARD 1 STANDARD
								0	1.002	141.645	375	1 STANDARD
SW03	525203.269	227841.879	143.150	1.853	1350	Manhole	1 STANDARD	 1 2	3.001 1.002	141.447 141.372	300 375	1 STANDARD 1 STANDARD
								0	1.003	141.297	450	1 STANDARD
SW04	525169.846	227851.911	143.000	1.877	1350	Manhole	1 STANDARD	 1 2	4.000 1.003	141.348 141.123	225 450	1 STANDARD 1 STANDARD
								0	1.004	141.123	450	1 STANDARD
SW05	525123.933	227829.436	142.700	1.907	1500	Manhole	1 STANDARD	 1 2 3	6.001 5.001 1.004	141.092 141.018 140.868	225 300 450	1 STANDARD 1 STANDARD 1 STANDARD
								0	1.005	140.793	525	1 STANDARD
SW06	525088.840	227811.196	142.568	1.907	1500	Manhole	1 STANDARD	 1	1.005	140.661	525	1 STANDARD
								0	1.006	140.661	525	1 STANDARD
SW07	525079.798	227800.812	142.522	1.907	1500	Manhole	1 STANDARD	 1 2	7.000 1.006	140.990 140.615	150 525	1 STANDARD 1 STANDARD
								0	1.007	140.615	525	1 STANDARD
SW08	525086.818	227783.866	142.246	1.725	1500	Manhole	1 STANDARD	 1 2	8.006 1.007	140.746 140.521	300 525	1 STANDARD 1 STANDARD
								0	1.008	140.521	525	1 STANDARD
Basin 01	525077.041	227779.627	142.000	1.500		Junction		 1	1.008	140.500	525	1 STANDARD
								0	1.009	140.500	525	1 STANDARD
1	525060.963	227835.215	141.700	1.113	1500	Manhole	1 STANDARD	 0	10.000	140.587	525	1 STANDARD
2	525052.761	227807.569	141.700	1.171	1500	Manhole	1 STANDARD	 1	10.000	140.529	525	1 STANDARD
								0	10.001	140.529	525	1 STANDARD
3	525056.374	227784.270	141.700	1.219	1500	Manhole	1 STANDARD	 1 2	10.001 1.009	140.482 140.481	525 525	1 STANDARD 1 STANDARD
								0	1.010	140.481	525	1 STANDARD
4	525029.988	227715.739	141.800	1.466	1500	Manhole	1 STANDARD	 1	1.010	140.334	525	1 STANDARD
								0	1.011	140.334	525	1 STANDARD
5	525030.197	227705.655	141.900	1.586	1500	Manhole	1 STANDARD	 1 2	11.004 1.011	140.615 140.314	225 525	1 STANDARD 1 STANDARD
								0	1.012	140.314	525	1 STANDARD
6	525027.475	227693.385	141.900	1.611	1500	Manhole	1 STANDARD	 1 2	12.002 1.012	140.589 140.289	225 525	1 STANDARD 1 STANDARD
								0	1.013	140.289	525	1 STANDARD
7	524999.847	227627.627	141.750	1.604	1500	Manhole	1 STANDARD	 1 2	13.003 1.013	140.371 140.146	300 525	1 STANDARD 1 STANDARD
								0	1.014	140.146	525	1 STANDARD



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
8	524989.464	227605.204	141.750	1.653	1500	Manhole	1 STANDARD		1 1.014	140.097	525	1 STANDARD
								0	1.015	140.097	525	1 STANDARD
9	524990.526	227594.811	141.750	1.674	1500	Manhole	1 STANDARD		1 1.015	140.076	525	1 STANDARD
								0	1.016	140.076	525	1 STANDARD
10	524986.384	227583.137	141.700	1.649	1500	Manhole	1 STANDARD		1 1.016	140.051	525	1 STANDARD
								0	1.017	140.051	525	1 STANDARD
SW09	525010.217	227569.286	141.650	1.654	1500	Manhole	1 STANDARD		1 14.001	140.341	150	1 STANDARD
								2	1.017	139.996	525	1 STANDARD
								0	1.018	139.996	525	1 STANDARD
SW15	525092.257	227756.388	142.600	1.455	1200	Manhole	1 STANDARD		1 9.000	141.145	225	1 STANDARD
								0	9.001	141.145	225	1 STANDARD
SW16	525098.178	227750.387	142.750	1.850	1350	Manhole	1 STANDARD		1 8.004	140.975	225	1 STANDARD
								0	8.005	140.900	300	1 STANDARD
SW17	525097.306	227759.567	142.359	1.499	1200	Manhole	1 STANDARD		1 9.001	140.935	225	1 STANDARD
								2	8.005	140.860	300	1 STANDARD
								0	8.006	140.860	300	1 STANDARD
SW83	525123.788	227742.323	142.950	1.778	1350	Manhole	1 STANDARD		1 8.003	141.172	225	1 STANDARD
								0	8.004	141.172	225	1 STANDARD
SW19	525084.669	227713.295	142.600	1.561	1350	Manhole	1 STANDARD		1 11.000	141.114	150	1 STANDARD
								0	11.001	141.039	225	1 STANDARD
SW20	525079.257	227698.207	142.450	1.507	1350	Manhole	1 STANDARD		1 11.001	140.943	225	1 STANDARD
								0	11.002	140.943	225	1 STANDARD
SW21	525053.436	227708.831	142.200	1.424	1200	Manhole	1 STANDARD		1 11.002	140.776	225	1 STANDARD
								0	11.003	140.776	225	1 STANDARD
SW22	525041.394	227713.729	142.122	1.424	1200	Manhole	1 STANDARD		1 11.003	140.698	225	1 STANDARD
								0	11.004	140.698	225	1 STANDARD
SW18	525093.286	227735.695	142.704	1.350	1200	Manhole	1 STANDARD					
								0	11.000	141.354	150	1 STANDARD
SW23	525071.352	227676.352	142.450	1.425	1200	Manhole	1 STANDARD					
								0	12.000	141.025	225	1 STANDARD
SW24	525041.430	227687.848	142.258	1.425	1200	Manhole	1 STANDARD		1 12.000	140.833	225	1 STANDARD
								0	12.001	140.833	225	1 STANDARD
SW25	525034.489	227690.623	142.213	1.425	1200	Manhole	1 STANDARD		1 12.001	140.788	225	1 STANDARD
								0	12.002	140.788	225	1 STANDARD
SW26	525056.913	227640.501	142.450	1.425	1200	Manhole	1 STANDARD					
								0	13.000	141.025	225	1 STANDARD
SW27	525044.974	227611.417	142.262	1.500	1200	Manhole	1 STANDARD		1 13.000	140.837	225	1 STANDARD
								0	13.001	140.762	300	1 STANDARD
SW28	525028.251	227618.076	142.185	1.500	1200	Manhole	1 STANDARD		1 13.001	140.685	300	1 STANDARD
								0	13.002	140.685	300	1 STANDARD
SW29	525008.898	227626.229	142.095	1.500	1200	Manhole	1 STANDARD		1 13.002	140.595	300	1 STANDARD
								0	13.003	140.595	300	1 STANDARD

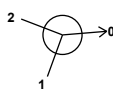
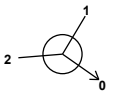
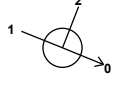
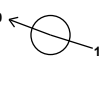
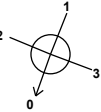
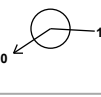
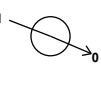
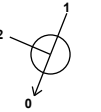


Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SW30	525026.937	227567.894	141.878	1.350	1200	Manhole	1 STANDARD		0	14.000	140.528	150 1 STANDARD
SW31	525022.294	227564.579	141.821	1.350	1200	Manhole	1 STANDARD		1	14.000	140.471	150 1 STANDARD
11	525328.222	227774.816	143.900	2.784	1500	Manhole	1 STANDARD		1	14.001	140.471	150 1 STANDARD
12	525287.257	227741.535	143.850	2.840	1500	Manhole	1 STANDARD		1	21.004	141.341	300 1 STANDARD
13	525266.449	227711.764	143.750	2.813	1500	Manhole	1 STANDARD		0	21.005	141.116	525 1 STANDARD
14	525261.172	227699.708	143.650	2.739	1500	Manhole	1 STANDARD		1	21.005	141.010	525 1 STANDARD
SW37	525256.831	227690.094	143.550	2.660	1500	Manhole	1 STANDARD		0	21.006	141.010	525 1 STANDARD
16	525252.437	227680.480	143.450	2.581	1500	Manhole	1 STANDARD		1	21.006	140.937	525 1 STANDARD
17	525223.494	227608.844	143.000	2.286	1500	Manhole	1 STANDARD		0	21.007	140.937	525 1 STANDARD
SW38	525222.370	227606.062	142.950	2.317	1500	Manhole	1 STANDARD		1	21.007	140.911	525 1 STANDARD
19	525221.246	227603.280	143.200	2.573	1500	Manhole	1 STANDARD		0	21.008	140.911	525 1 STANDARD
20	525203.129	227558.536	142.550	2.095	1500	Manhole	1 STANDARD		1	26.001	141.040	375 1 STANDARD
21	525180.863	227503.141	142.100	1.764	1500	Manhole	1 STANDARD		2	21.008	140.890	525 1 STANDARD
SW32	525312.626	227837.976	143.600	1.425	1200	Manhole	1 STANDARD		0	21.009	140.890	525 1 STANDARD
SW33	525300.698	227825.839	143.500	1.502	1350	Manhole	1 STANDARD		1	21.009	140.869	525 1 STANDARD
SW34	525313.775	227809.356	143.650	1.778	1350	Manhole	1 STANDARD		0	21.010	140.869	525 1 STANDARD
SW35	525329.909	227789.072	143.850	2.133	1350	Manhole	1 STANDARD		1	21.010	140.714	525 1 STANDARD
SW36	525335.958	227781.092	143.900	2.243	1350	Manhole	1 STANDARD		0	21.011	140.714	525 1 STANDARD
SW41	525249.582	227792.512	143.400	1.575	1350	Manhole	1 STANDARD		1	21.011	140.708	525 1 STANDARD
SW42	525242.527	227770.427	143.400	1.789	1350	Manhole	1 STANDARD		0	21.012	140.633	600 1 STANDARD
									1	21.012	140.627	600 1 STANDARD
									0	21.013	140.627	600 1 STANDARD
									1	21.013	140.530	600 1 STANDARD
									2	15.014	140.605	525 1 STANDARD
									0	15.015	140.455	675 1 STANDARD
									1	15.015	140.336	675 1 STANDARD
									0	15.016	140.336	675 1 STANDARD
									0	21.000	142.175	225 1 STANDARD
									1	21.000	142.073	225 1 STANDARD
									0	21.001	141.998	300 1 STANDARD
									1	21.001	141.872	300 1 STANDARD
									0	21.002	141.872	300 1 STANDARD
									1	22.000	141.792	225 1 STANDARD
									2	21.002	141.717	300 1 STANDARD
									0	21.003	141.717	300 1 STANDARD
									1	21.003	141.657	300 1 STANDARD
									0	21.004	141.657	300 1 STANDARD
									0	23.000	141.825	225 1 STANDARD
									1	23.000	141.686	225 1 STANDARD
									0	23.001	141.611	300 1 STANDARD

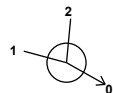
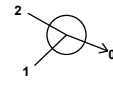
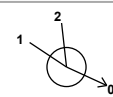
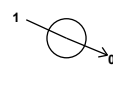


Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SW43	525240.097	227762.795	143.400	1.837	1350	Manhole	1 STANDARD		1 23.001	141.563	300	1 STANDARD
								0	23.002	141.563	300	1 STANDARD
SW44	525257.954	227755.928	143.550	2.082	1350	Manhole	1 STANDARD		1 24.000	141.618	150	1 STANDARD
								2	23.002	141.468	300	1 STANDARD
								0	23.003	141.468	300	1 STANDARD
SW45	525269.075	227756.841	143.600	2.188	1350	Manhole	1 STANDARD		1 25.000	141.552	150	1 STANDARD
								2	23.003	141.412	300	1 STANDARD
								0	23.004	141.412	300	1 STANDARD
SW46	525283.956	227746.415	143.800	2.479	1350	Manhole	1 STANDARD		1 23.004	141.321	300	1 STANDARD
								0	23.005	141.321	300	1 STANDARD
SW47	525226.838	227734.319	143.400	1.500	1200	Manhole	1 STANDARD		0 26.000	141.900	300	1 STANDARD
SW48	525216.049	227706.725	143.500	1.852	1350	Manhole	1 STANDARD		1 27.000	141.723	300	1 STANDARD
								2	26.000	141.723	300	1 STANDARD
								0	26.001	141.648	375	1 STANDARD
SW39	525163.866	227508.483	142.175	1.875	1500	Manhole	1 STANDARD		1 15.016	140.300	675	1 STANDARD
								0	15.017	140.300	675	1 STANDARD
SW40	525133.909	227519.734	142.000	2.000	1500	Manhole	1 STANDARD		1 30.001	140.525	150	1 STANDARD
								2	28.004	140.375	300	1 STANDARD
								3	15.017	140.000	675	1 STANDARD
								0	15.018	140.000	675	1 STANDARD
SW49	525213.854	227779.285	143.620	1.500	1200	Manhole	1 STANDARD		0 15.000	142.120	300	1 STANDARD
								0	15.000	141.924	300	1 STANDARD
SW50	525181.150	227781.099	143.424	1.500	1200	Manhole	1 STANDARD		1 15.000	141.924	300	1 STANDARD
								0	15.001	141.924	300	1 STANDARD
SW51	525160.169	227767.178	143.300	1.602	1350	Manhole	1 STANDARD		1 15.001	141.773	300	1 STANDARD
								0	15.002	141.698	375	1 STANDARD
SW52	525164.293	227752.497	143.200	1.578	1350	Manhole	1 STANDARD		1 15.002	141.622	375	1 STANDARD
								0	15.003	141.622	375	1 STANDARD
SW53	525150.140	227725.540	143.100	1.705	1350	Manhole	1 STANDARD		1 15.003	141.470	375	1 STANDARD
								0	15.004	141.395	450	1 STANDARD
SW54	525139.910	227700.271	143.050	1.746	1350	Manhole	1 STANDARD		1 15.004	141.304	450	1 STANDARD
								0	15.005	141.304	450	1 STANDARD
SW55	525132.637	227681.536	143.000	1.763	1350	Manhole	1 STANDARD		1 15.005	141.237	450	1 STANDARD
								0	15.006	141.237	450	1 STANDARD
SW56	525120.366	227648.757	142.850	1.805	1500	Manhole	1 STANDARD		1 15.006	141.120	450	1 STANDARD
								0	15.007	141.045	525	1 STANDARD
SW57	525150.218	227637.228	142.850	1.912	1500	Manhole	1 STANDARD		1 15.007	140.938	525	1 STANDARD
								0	15.008	140.938	525	1 STANDARD
SW58	525176.100	227626.153	143.050	2.206	1500	Manhole	1 STANDARD		1 16.001	140.994	375	1 STANDARD
								2	15.008	140.844	525	1 STANDARD
								0	15.009	140.844	525	1 STANDARD
SW59	525168.829	227607.645	142.950	2.156	1500	Manhole	1 STANDARD		1 15.009	140.794	525	1 STANDARD
								0	15.010	140.794	525	1 STANDARD
SW60	525162.325	227591.206	142.800	2.050	1500	Manhole	1 STANDARD		1 15.010	140.750	525	1 STANDARD
								0	15.011	140.750	525	1 STANDARD

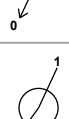
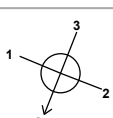
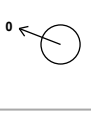
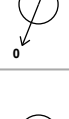
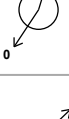


Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SW61	525161.100	227578.147	142.700	1.983	1500	Manhole	1 STANDARD		1 19.000 141.017 225 1 STANDARD			
									2 15.011 140.717 525 1 STANDARD			
									0 15.012 140.717 525 1 STANDARD			
SW62	525178.854	227568.163	142.500	1.834	1500	Manhole	1 STANDARD		1 20.000 140.666 525 1 STANDARD			
									2 15.012 140.666 525 1 STANDARD			
									0 15.013 140.666 525 1 STANDARD			
SW63	525200.255	227559.837	142.500	1.885	1500	Manhole	1 STANDARD		1 15.013 140.615 525 1 STANDARD			
									0 15.014 140.615 525 1 STANDARD			
SW64	525107.196	227616.711	142.950	1.625	1200	Manhole	1 STANDARD					
SW65	525097.340	227590.859	142.925	1.766	1350	Manhole	1 STANDARD		1 28.000 141.159 225 1 STANDARD			
									0 28.001 141.159 225 1 STANDARD			
SW66	525081.022	227550.428	142.264	1.366	1200	Manhole	1 STANDARD		1 28.001 140.898 225 1 STANDARD			
									0 28.002 140.898 225 1 STANDARD			
SW67	525081.943	227542.214	142.215	1.441	1200	Manhole	1 STANDARD		1 29.000 140.849 225 1 STANDARD			
									2 28.002 140.849 225 1 STANDARD			
									0 28.003 140.774 300 1 STANDARD			
SW68	525103.416	227532.349	142.132	1.500	1200	Manhole	1 STANDARD		1 28.003 140.632 300 1 STANDARD			
									0 28.004 140.632 300 1 STANDARD			
SW69	525262.211	227879.011	143.478	1.425	1200	Manhole	1 STANDARD					
									0 1.000 142.053 225 1 STANDARD			
SW70	525260.238	227858.126	143.352	1.425	1200	Manhole	1 STANDARD		1 1.000 141.927 225 1 STANDARD			
									0 1.001 141.927 225 1 STANDARD			
SW71	525206.895	227869.286	143.152	1.425	1200	Manhole	1 STANDARD					
									0 3.000 141.727 225 1 STANDARD			
SW72	525205.789	227857.477	143.081	1.500	1200	Manhole	1 STANDARD		1 3.000 141.656 225 1 STANDARD			
									0 3.001 141.581 300 1 STANDARD			
SW73	525165.090	227866.551	142.950	1.425	1200	Manhole	1 STANDARD					
									0 4.000 141.525 225 1 STANDARD			
SW74	525102.905	227869.228	142.900	1.425	1200	Manhole	1 STANDARD					
									0 5.000 141.475 225 1 STANDARD			
SW75	525117.081	227842.508	142.789	1.591	1350	Manhole	1 STANDARD		1 5.000 141.273 225 1 STANDARD			
									0 5.001 141.198 300 1 STANDARD			
SW76	525136.141	227812.707	142.642	1.425	1200	Manhole	1 STANDARD					
									0 6.000 141.217 225 1 STANDARD			
SW77	525127.905	227825.474	142.580	1.454	1200	Manhole	1 STANDARD		1 6.000 141.126 225 1 STANDARD			
									0 6.001 141.126 225 1 STANDARD			
SW78	525076.151	227802.274	142.379	1.350	1200	Manhole	1 STANDARD					
									0 7.000 141.029 150 1 STANDARD			
SW79	525144.089	227777.739	142.866	1.350	1200	Manhole	1 STANDARD					
									0 8.000 141.516 150 1 STANDARD			
SW80	525139.878	227775.392	142.818	1.425	1200	Manhole	1 STANDARD		1 8.000 141.468 150 1 STANDARD			
									0 8.001 141.393 225 1 STANDARD			



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
SW81	525134.413	227763.281	142.738	1.425	1200	Manhole	1 STANDARD		1	8.001	141.313	225	1 STANDARD
									0	8.002	141.313	225	1 STANDARD
SW82	525126.243	227745.692	142.950	1.753	1350	Manhole	1 STANDARD		1	8.002	141.197	225	1 STANDARD
									0	8.003	141.197	225	1 STANDARD
SW84	525346.618	227802.549	143.850	1.425	1200	Manhole	1 STANDARD		0	22.000	142.425	225	1 STANDARD
SW85	525253.841	227744.609	143.600	1.350	1200	Manhole	1 STANDARD		0	24.000	142.250	150	1 STANDARD
SW86	525276.346	227769.003	143.600	1.350	1200	Manhole	1 STANDARD		0	25.000	142.250	150	1 STANDARD
SW87	525194.799	227715.269	143.450	1.500	1200	Manhole	1 STANDARD		0	27.000	141.950	300	1 STANDARD
SW88	525199.659	227685.745	143.200	1.350	1200	Manhole	1 STANDARD		0	16.000	141.850	150	1 STANDARD
SW89	525191.623	227665.299	143.100	1.695	1350	Manhole	1 STANDARD		1 2 3 0	18.000 17.000 16.000 16.001	141.480 141.480 141.630 141.405	300 300 150 375	1 STANDARD 1 STANDARD 1 STANDARD 1 STANDARD
SW91	525204.822	227660.193	143.200	1.350	1200	Manhole	1 STANDARD		0	17.000	141.850	300	1 STANDARD
SW90	525181.611	227669.468	143.100	1.350	1200	Manhole	1 STANDARD		0	18.000	141.750	300	1 STANDARD
SW92	525146.815	227582.008	142.712	1.425	1200	Manhole	1 STANDARD		0	19.000	141.287	225	1 STANDARD
SW93	525151.388	227563.813	142.500	1.350	1200	Manhole	1 STANDARD		0	30.000	141.150	150	1 STANDARD
SW94	525141.989	227540.056	142.244	1.350	1200	Manhole	1 STANDARD		1	30.000	140.895	150	1 STANDARD
									0	30.001	140.894	150	1 STANDARD
SW95	525060.827	227556.250	142.424	1.425	1200	Manhole	1 STANDARD		0	29.000	140.999	225	1 STANDARD
SW13	524980.115	227502.455	141.250	1.912	1350	Manhole	1 STANDARD		1	1.022	139.338	225	1 STANDARD
									0	1.023	139.338	225	1 STANDARD
Tank 01	525174.029	227563.537	142.500	1.400		Junction			0	20.000	141.100	525	1 STANDARD

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	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 %)
30	35	0	0	100	40	0	0



Node SW10 (FC) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	139.835	Product Number	CTL-SHE-0155-1430-2065-1430
Design Depth (m)	2.065	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	14.3	Min Node Diameter (mm)	1500

Node Basin 04 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	139.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	489.2	0.0	0.500	819.4	0.0	1.000	1178.1	0.0	1.500	1551.7	0.0	1.950	1900.2	0.0

Node Basin 03 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	140.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	7.7	0.0	0.500	41.5	0.0	1.000	101.3	0.0	1.500	177.4	0.0	1.800	230.2	0.0

Node Basin 02 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	139.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	404.8	0.0	0.500	571.1	0.0	1.000	752.7	0.0	1.500	948.5	0.0	1.950	1136.9	0.0

Node Tank 01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	141.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	6

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	115.0	0.0	0.800	115.0	0.0	0.801	0.0	0.0

Node Basin 01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	140.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	20

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	109.7	0.0	0.500	190.4	0.0	1.000	285.6	0.0	1.500	395.4	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year +35% CC 15 minute summer	374.904	106.085	100 year +40% CC 15 minute summer	489.144	138.411
30 year +35% CC 15 minute winter	263.091	106.085	100 year +40% CC 15 minute winter	343.259	138.411
30 year +35% CC 30 minute summer	243.582	68.925	100 year +40% CC 30 minute summer	320.433	90.672
30 year +35% CC 30 minute winter	170.934	68.925	100 year +40% CC 30 minute winter	224.865	90.672
30 year +35% CC 60 minute summer	160.839	42.505	100 year +40% CC 60 minute summer	213.049	56.303
30 year +35% CC 60 minute winter	106.858	42.505	100 year +40% CC 60 minute winter	141.545	56.303
30 year +35% CC 120 minute summer	101.203	26.745	100 year +40% CC 120 minute summer	131.024	34.626
30 year +35% CC 120 minute winter	67.237	26.745	100 year +40% CC 120 minute winter	87.049	34.626
30 year +35% CC 180 minute summer	77.415	19.922	100 year +40% CC 180 minute summer	99.491	25.602
30 year +35% CC 180 minute winter	50.322	19.922	100 year +40% CC 180 minute winter	64.672	25.602
30 year +35% CC 240 minute summer	60.577	16.009	100 year +40% CC 240 minute summer	77.587	20.504
30 year +35% CC 240 minute winter	40.246	16.009	100 year +40% CC 240 minute winter	51.547	20.504
30 year +35% CC 360 minute summer	45.101	11.606	100 year +40% CC 360 minute summer	57.596	14.821
30 year +35% CC 360 minute winter	29.317	11.606	100 year +40% CC 360 minute winter	37.439	14.821
30 year +35% CC 480 minute summer	34.649	9.157	100 year +40% CC 480 minute summer	44.215	11.685
30 year +35% CC 480 minute winter	23.020	9.157	100 year +40% CC 480 minute winter	29.375	11.685
30 year +35% CC 600 minute summer	27.758	7.592	100 year +40% CC 600 minute summer	35.399	9.682
30 year +35% CC 600 minute winter	18.966	7.592	100 year +40% CC 600 minute winter	24.187	9.682
30 year +35% CC 720 minute summer	24.264	6.503	100 year +40% CC 720 minute summer	30.922	8.287
30 year +35% CC 720 minute winter	16.307	6.503	100 year +40% CC 720 minute winter	20.781	8.287
30 year +35% CC 960 minute summer	19.294	5.080	100 year +40% CC 960 minute summer	24.536	6.461
30 year +35% CC 960 minute winter	12.780	5.080	100 year +40% CC 960 minute winter	16.253	6.461
30 year +35% CC 1440 minute summer	13.360	3.581	100 year +40% CC 1440 minute summer	16.934	4.538
30 year +35% CC 1440 minute winter	8.979	3.581	100 year +40% CC 1440 minute winter	11.381	4.538



Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Basin 04	720	141.334	1.384	102.2	1334.5980	0.0000	SURCHARGED
720 minute winter	Basin 03	720	141.334	1.234	15.0	75.9252	0.0000	SURCHARGED
720 minute winter	Basin 02	720	141.334	1.384	59.0	893.1954	0.0000	SURCHARGED
720 minute winter	SW10 (FC)	720	141.334	1.499	68.0	3.3316	0.0000	SURCHARGED
60 minute summer	SW11	36	139.835	0.094	14.3	0.1341	0.0000	OK
15 minute winter	SW12	18	139.553	0.097	14.3	0.1381	0.0000	OK
240 minute winter	EXManhole	104	139.104	0.074	14.3	0.0000	0.0000	OK
30 minute winter	SW14	22	141.493	0.268	18.1	0.4874	0.0000	SURCHARGED
15 minute winter	SW01	12	142.322	0.347	22.7	0.6208	0.0000	SURCHARGED
15 minute winter	SW02	12	142.298	0.653	97.2	1.5226	0.0000	SURCHARGED
15 minute winter	SW03	12	142.195	0.898	189.0	2.9235	0.0000	SURCHARGED
15 minute winter	SW04	12	142.090	0.967	230.9	2.2173	0.0000	SURCHARGED
15 minute winter	SW05	12	141.840	1.047	343.0	2.6410	0.0000	SURCHARGED
15 minute winter	SW06	13	141.608	0.947	361.3	2.1697	0.0000	SURCHARGED
30 minute winter	SW07	23	141.492	0.877	316.8	1.8075	0.0000	SURCHARGED
30 minute winter	SW08	25	141.428	0.907	404.5	2.3189	0.0000	SURCHARGED
30 minute winter	Basin 01	26	141.399	0.899	400.0	166.0576	0.0000	SURCHARGED
30 minute winter	1	26	141.371	0.784	19.7	1.6945	0.0000	SURCHARGED
30 minute winter	2	26	141.370	0.841	47.9	1.4861	0.0000	SURCHARGED
30 minute winter	3	26	141.373	0.891	200.6	1.5752	0.0000	SURCHARGED
720 minute winter	4	720	141.334	1.000	41.7	1.7674	0.0000	SURCHARGED
720 minute winter	5	720	141.334	1.020	45.7	1.8028	0.0000	SURCHARGED
720 minute winter	6	720	141.334	1.045	48.5	1.8469	0.0000	SURCHARGED
720 minute winter	7	720	141.334	1.188	56.2	2.0998	0.0000	SURCHARGED
720 minute winter	8	720	141.334	1.237	54.1	2.1864	0.0000	SURCHARGED
720 minute winter	9	720	141.334	1.258	53.5	2.2235	0.0000	SURCHARGED
720 minute winter	10	720	141.334	1.283	53.2	2.2677	0.0000	SURCHARGED
720 minute winter	SW09	720	141.334	1.338	54.7	3.1425	0.0000	SURCHARGED
30 minute winter	SW15	22	141.486	0.341	29.2	0.5262	0.0000	SURCHARGED
30 minute winter	SW16	22	141.489	0.589	42.4	0.9131	0.0000	SURCHARGED
30 minute winter	SW17	23	141.476	0.616	73.1	0.8618	0.0000	SURCHARGED
15 minute winter	SW83	13	141.692	0.520	47.3	0.8026	0.0000	SURCHARGED
15 minute winter	SW19	12	141.815	0.775	35.0	1.6463	0.0000	SURCHARGED
15 minute winter	SW20	12	141.755	0.811	42.4	1.5061	0.0000	SURCHARGED
15 minute winter	SW21	12	141.566	0.790	59.9	1.4482	0.0000	SURCHARGED
15 minute winter	SW22	13	141.365	0.667	70.1	1.0356	0.0000	SURCHARGED
15 minute winter	SW18	12	141.880	0.526	12.1	0.7888	0.0000	SURCHARGED
720 minute winter	SW23	720	141.334	0.309	1.8	0.5581	0.0000	SURCHARGED
720 minute winter	SW24	720	141.334	0.501	3.6	0.8907	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)
720 minute winter	Basin 04	15.019	SW10 (FC)	37.6	0.426	0.041	4.3537	
720 minute winter	Basin 03	31.000	SW10 (FC)	-15.0	-0.172	-0.019	4.1883	
720 minute winter	Basin 02	1.019	SW10 (FC)	19.3	0.316	0.063	5.6496	
720 minute winter	SW10 (FC)	Hydro-Brake®	SW11	14.3				
60 minute summer	SW11	1.021	SW12	14.3	0.897	0.356	0.7598	
15 minute winter	SW12	1.022	SW13	14.3	1.018	0.356	0.2775	
30 minute winter	SW14	9.000	SW15	18.1	1.056	0.451	0.5330	
15 minute winter	SW01	2.000	SW02	22.0	1.014	0.548	1.1983	
15 minute winter	SW02	1.002	SW03	82.8	1.143	0.587	6.0289	
15 minute winter	SW03	1.003	SW04	168.3	1.216	0.738	5.5290	
15 minute winter	SW04	1.004	SW05	202.7	1.280	0.889	8.0854	
15 minute winter	SW05	1.005	SW06	340.9	1.578	1.224	8.5631	
15 minute winter	SW06	1.006	SW07	357.0	1.652	1.281	2.9746	
30 minute winter	SW07	1.007	SW08	314.2	1.454	0.907	3.9627	
30 minute winter	SW08	1.008	Basin 01	400.0	2.062	1.872	2.3020	
30 minute winter	Basin 01	1.009	3	200.6	1.203	0.932	2.0739	
30 minute winter	1	10.000	2	-11.6	0.376	-0.054	6.2297	
30 minute winter	2	10.001	3	-47.9	0.289	-0.223	5.0934	
30 minute winter	3	1.010	4	194.5	0.900	0.903	15.8644	
720 minute winter	4	1.011	5	39.8	0.573	0.186	2.1789	
720 minute winter	5	1.012	6	45.1	0.681	0.210	2.7207	
720 minute winter	6	1.013	7	46.6	0.581	0.216	15.3990	
720 minute winter	7	1.014	8	54.1	0.567	0.252	5.3382	
720 minute winter	8	1.015	9	53.5	0.537	0.248	2.2569	
720 minute winter	9	1.016	10	53.2	0.555	0.246	2.6760	
720 minute winter	10	1.017	SW09	52.8	0.637	0.245	5.9552	
720 minute winter	SW09	1.018	Basin 02	54.9	1.345	0.143	1.5801	
30 minute winter	SW15	9.001	SW17	27.3	1.458	0.279	0.2373	
30 minute winter	SW16	8.005	SW17	39.0	0.654	0.539	0.6493	
30 minute winter	SW17	8.006	SW08	72.3	1.155	0.995	1.8637	
15 minute winter	SW83	8.004	SW16	44.8	1.184	1.009	1.0679	
15 minute winter	SW19	11.001	SW20	27.9	0.847	0.695	0.6375	
15 minute winter	SW20	11.002	SW21	38.9	0.979	0.971	1.1104	
15 minute winter	SW21	11.003	SW22	56.6	1.422	1.410	0.5170	
15 minute winter	SW22	11.004	5	68.0	1.710	1.695	0.5490	
15 minute winter	SW18	11.000	SW19	10.5	0.954	0.590	0.4225	
720 minute winter	SW23	12.000	SW24	1.8	0.397	0.045	1.2748	
720 minute winter	SW24	12.001	SW25	3.6	0.745	0.090	0.2973	



Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	SW25	720	141.334	0.546	4.1	0.7249	0.0000	SURCHARGED
15 minute winter	SW26	12	141.576	0.551	34.3	1.1728	0.0000	SURCHARGED
15 minute winter	SW27	12	141.459	0.697	101.0	2.1629	0.0000	SURCHARGED
720 minute winter	SW28	720	141.334	0.649	9.5	1.0116	0.0000	SURCHARGED
720 minute winter	SW29	720	141.334	0.739	11.3	1.4076	0.0000	SURCHARGED
720 minute winter	SW30	720	141.334	0.806	0.6	1.1031	0.0000	SURCHARGED
720 minute winter	SW31	720	141.334	0.863	0.5	0.9765	0.0000	SURCHARGED
15 minute winter	11	13	142.299	1.183	110.5	2.0904	0.0000	SURCHARGED
15 minute winter	12	13	142.276	1.266	179.4	2.2371	0.0000	SURCHARGED
15 minute winter	13	13	142.206	1.269	183.4	2.2421	0.0000	SURCHARGED
15 minute winter	14	13	142.168	1.257	186.9	2.2215	0.0000	SURCHARGED
15 minute winter	SW37	13	142.134	1.244	337.3	3.6664	0.0000	SURCHARGED
15 minute winter	16	13	142.028	1.159	326.9	2.0483	0.0000	SURCHARGED
15 minute winter	17	13	141.620	0.906	328.3	1.6010	0.0000	SURCHARGED
15 minute winter	SW38	13	141.547	0.914	355.3	2.3181	0.0000	SURCHARGED
15 minute winter	19	13	141.500	0.873	353.8	1.5419	0.0000	SURCHARGED
15 minute winter	20	14	141.339	0.884	622.4	1.5617	0.0000	SURCHARGED
720 minute winter	21	720	141.334	0.998	87.2	1.7641	0.0000	SURCHARGED
15 minute winter	SW32	13	142.578	0.403	29.4	0.8006	0.0000	SURCHARGED
15 minute winter	SW33	13	142.549	0.551	33.1	0.8547	0.0000	SURCHARGED
15 minute winter	SW34	13	142.537	0.665	58.1	1.3553	0.0000	SURCHARGED
15 minute winter	SW35	13	142.497	0.780	113.2	1.8033	0.0000	SURCHARGED
15 minute winter	SW36	13	142.404	0.747	112.4	1.1756	0.0000	SURCHARGED
15 minute winter	SW41	13	142.539	0.714	17.4	1.3488	0.0000	SURCHARGED
15 minute winter	SW42	13	142.526	0.915	43.3	1.9334	0.0000	SURCHARGED
15 minute winter	SW43	13	142.517	0.954	41.3	1.4173	0.0000	SURCHARGED
15 minute winter	SW44	13	142.497	1.029	58.1	1.6797	0.0000	SURCHARGED
15 minute winter	SW45	13	142.465	1.053	88.9	1.8525	0.0000	SURCHARGED
15 minute winter	SW46	13	142.357	1.036	112.2	1.9764	0.0000	SURCHARGED
15 minute winter	SW47	12	142.291	0.391	50.2	0.9849	0.0000	SURCHARGED
15 minute winter	SW48	12	142.264	0.616	145.5	1.4135	0.0000	SURCHARGED
720 minute winter	SW39	720	141.334	1.034	86.2	2.1587	0.0000	SURCHARGED
720 minute winter	SW40	720	141.334	1.334	102.9	3.9058	0.0000	SURCHARGED
15 minute winter	SW49	13	142.300	0.180	23.6	0.2732	0.0000	OK
15 minute winter	SW50	13	142.309	0.385	62.0	0.9482	0.0000	SURCHARGED
15 minute winter	SW51	12	142.275	0.577	78.4	1.1067	0.0000	SURCHARGED
15 minute winter	SW52	12	142.243	0.621	105.7	1.3536	0.0000	SURCHARGED
15 minute winter	SW53	12	142.181	0.786	119.4	1.4757	0.0000	SURCHARGED
15 minute winter	SW54	12	142.147	0.843	125.8	1.8348	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)
720 minute winter	SW25	12.002	6	4.1	1.019	0.048	0.2998	
15 minute winter	SW26	13.000	SW27	29.6	0.825	0.738	1.2504	
15 minute winter	SW27	13.001	SW28	94.6	1.344	1.308	1.2675	
720 minute winter	SW28	13.002	SW29	9.2	0.819	0.127	1.4788	
720 minute winter	SW29	13.003	7	10.6	1.173	0.061	0.6449	
720 minute winter	SW30	14.000	SW31	0.5	0.409	0.029	0.1004	
720 minute winter	SW31	14.001	SW09	0.4	0.379	0.024	0.2282	
15 minute winter	11	21.005	12	89.6	0.590	0.415	11.4022	
15 minute winter	12	21.006	13	183.4	0.849	0.849	7.8467	
15 minute winter	13	21.007	14	186.9	0.865	0.868	2.8430	
15 minute winter	14	21.008	SW37	190.2	0.880	0.886	2.2813	
15 minute winter	SW37	21.009	16	326.9	1.513	1.522	2.2811	
15 minute winter	16	21.010	17	328.3	1.520	1.523	16.6911	
15 minute winter	17	21.011	SW38	328.8	1.522	1.527	0.6481	
15 minute winter	SW38	21.012	19	353.8	1.256	1.156	0.8450	
15 minute winter	19	21.013	20	354.0	1.257	1.154	13.5974	
15 minute winter	20	15.015	21	622.6	1.744	1.496	21.3149	
720 minute winter	21	15.016	SW39	85.1	1.140	0.203	6.3378	
15 minute winter	SW32	21.000	SW33	28.8	1.060	0.718	0.6768	
15 minute winter	SW33	21.001	SW34	32.1	0.820	0.374	1.4816	
15 minute winter	SW34	21.002	SW35	47.8	0.807	0.557	1.8251	
15 minute winter	SW35	21.003	SW36	105.1	1.708	1.227	0.7052	
15 minute winter	SW36	21.004	11	110.5	2.579	0.556	0.7015	
15 minute winter	SW41	23.000	SW42	15.6	0.856	0.390	0.9221	
15 minute winter	SW42	23.001	SW43	39.0	0.931	0.454	0.5641	
15 minute winter	SW43	23.002	SW44	33.4	0.694	0.428	1.3473	
15 minute winter	SW44	23.003	SW45	50.5	0.813	0.646	0.7896	
15 minute winter	SW45	23.004	SW46	85.4	1.215	1.090	1.2795	
15 minute winter	SW46	23.005	12	105.2	1.795	0.783	0.4149	
15 minute winter	SW47	26.000	SW48	49.0	1.198	0.571	2.0864	
15 minute winter	SW48	26.001	SW37	129.8	1.619	0.552	4.8578	
720 minute winter	SW39	15.017	SW40	84.9	0.851	0.094	11.4233	
720 minute winter	SW40	15.018	Basin 04	102.2	1.544	0.145	3.1396	
15 minute winter	SW49	15.000	SW50	17.8	0.431	0.207	1.8757	
15 minute winter	SW50	15.001	SW51	59.6	1.273	0.695	1.7731	
15 minute winter	SW51	15.002	SW52	77.2	1.010	0.547	1.6819	
15 minute winter	SW52	15.003	SW53	101.1	1.322	0.717	3.3581	
15 minute winter	SW53	15.004	SW54	96.3	0.928	0.518	4.3193	
15 minute winter	SW54	15.005	SW55	113.9	1.052	0.613	3.1842	



Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW55	12	142.116	0.879	133.4	1.6864	0.0000	SURCHARGED
15 minute winter	SW56	12	142.057	1.012	154.0	2.6398	0.0000	SURCHARGED
15 minute winter	SW57	12	142.015	1.077	161.8	2.4213	0.0000	SURCHARGED
15 minute winter	SW58	12	141.979	1.135	280.2	3.2617	0.0000	SURCHARGED
15 minute winter	SW59	12	141.876	1.082	289.9	2.0131	0.0000	SURCHARGED
15 minute winter	SW60	12	141.771	1.021	307.7	2.2025	0.0000	SURCHARGED
15 minute winter	SW61	12	141.666	0.949	389.4	2.0020	0.0000	SURCHARGED
15 minute winter	SW62	15	141.525	0.859	432.9	2.6974	0.0000	SURCHARGED
15 minute winter	SW63	14	141.396	0.781	324.0	1.8686	0.0000	SURCHARGED
15 minute winter	SW64	12	142.116	0.791	32.3	1.5471	0.0000	SURCHARGED
15 minute winter	SW65	12	142.033	0.874	51.7	1.8245	0.0000	SURCHARGED
15 minute winter	SW66	12	141.595	0.697	74.7	1.4219	0.0000	SURCHARGED
15 minute winter	SW67	12	141.339	0.565	107.3	0.9365	0.0000	SURCHARGED
720 minute winter	SW68	720	141.334	0.702	11.3	1.0283	0.0000	SURCHARGED
15 minute winter	SW69	12	142.400	0.347	18.3	0.5777	0.0000	SURCHARGED
15 minute winter	SW70	12	142.373	0.446	43.2	0.8299	0.0000	SURCHARGED
15 minute winter	SW71	12	142.205	0.478	18.8	0.8017	0.0000	SURCHARGED
15 minute winter	SW72	12	142.208	0.627	29.6	0.9424	0.0000	SURCHARGED
15 minute winter	SW73	12	142.113	0.588	26.5	1.1183	0.0000	SURCHARGED
15 minute winter	SW74	12	142.003	0.528	31.9	1.0866	0.0000	SURCHARGED
15 minute winter	SW75	12	141.920	0.722	82.7	2.0946	0.0000	SURCHARGED
15 minute winter	SW76	12	141.961	0.744	33.3	1.5613	0.0000	SURCHARGED
15 minute winter	SW77	12	141.913	0.787	52.0	1.4310	0.0000	SURCHARGED
15 minute winter	SW78	13	141.510	0.481	18.8	0.8217	0.0000	SURCHARGED
15 minute winter	SW79	12	141.939	0.423	24.6	0.7985	0.0000	SURCHARGED
15 minute winter	SW80	12	141.851	0.458	25.7	0.5754	0.0000	SURCHARGED
15 minute winter	SW81	12	141.819	0.506	35.0	0.7353	0.0000	SURCHARGED
15 minute winter	SW82	13	141.738	0.541	45.7	0.9779	0.0000	SURCHARGED
15 minute winter	SW84	13	142.516	0.091	24.6	0.1684	0.0000	OK
15 minute winter	SW85	13	142.546	0.296	16.4	0.4834	0.0000	SURCHARGED
15 minute winter	SW86	13	142.588	0.338	23.7	0.6272	0.0000	SURCHARGED
15 minute winter	SW87	12	142.321	0.371	58.9	1.0240	0.0000	SURCHARGED
15 minute winter	SW88	12	142.093	0.243	7.7	0.3324	0.0000	SURCHARGED
15 minute winter	SW89	12	142.074	0.669	114.0	1.2889	0.0000	SURCHARGED
15 minute winter	SW91	12	142.069	0.219	43.0	0.5370	0.0000	OK
15 minute winter	SW90	12	142.086	0.336	43.9	0.8331	0.0000	SURCHARGED
15 minute winter	SW92	12	142.022	0.735	86.9	2.6882	0.0000	SURCHARGED
15 minute winter	SW93	12	141.663	0.513	16.4	0.8391	0.0000	SURCHARGED
15 minute winter	SW94	12	141.488	0.594	34.2	1.0852	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW55	15.006	SW56	119.5	1.139	0.643	5.5457	
15 minute winter	SW56	15.007	SW57	144.5	0.847	0.518	6.9133	
15 minute winter	SW57	15.008	SW58	155.5	0.720	0.558	6.0818	
15 minute winter	SW58	15.009	SW59	286.1	1.324	1.183	4.2958	
15 minute winter	SW59	15.010	SW60	292.6	1.355	1.214	3.8192	
15 minute winter	SW60	15.011	SW61	305.9	1.416	1.269	2.8335	
15 minute winter	SW61	15.012	SW62	385.4	1.784	1.599	4.4004	
15 minute winter	SW62	15.013	SW63	322.0	1.491	1.419	4.9664	
15 minute winter	SW63	15.014	20	326.2	1.510	1.200	0.6816	
15 minute winter	SW64	28.000	SW65	25.9	0.824	0.646	1.0998	
15 minute winter	SW65	28.001	SW66	48.5	1.219	1.209	1.7340	
15 minute winter	SW66	28.002	SW67	73.0	1.835	1.820	0.3287	
15 minute winter	SW67	28.003	SW68	106.9	1.518	1.244	1.6641	
720 minute winter	SW68	28.004	SW40	10.5	0.822	0.107	2.3238	
15 minute winter	SW69	1.000	SW70	18.1	0.635	0.451	0.8343	
15 minute winter	SW70	1.001	SW02	40.9	1.154	1.019	0.8754	
15 minute winter	SW71	3.000	SW72	16.9	0.926	0.421	0.4717	
15 minute winter	SW72	3.001	SW03	29.3	1.015	0.287	1.1126	
15 minute winter	SW73	4.000	SW04	25.9	1.221	0.464	0.6122	
15 minute winter	SW74	5.000	SW75	29.5	1.040	0.697	1.2030	
15 minute winter	SW75	5.001	SW05	71.5	1.502	0.582	1.0393	
15 minute winter	SW76	6.000	SW77	27.9	0.709	0.696	0.6042	
15 minute winter	SW77	6.001	SW05	45.2	1.137	1.127	0.2231	
15 minute winter	SW78	7.000	SW07	15.8	1.022	0.890	0.0692	
15 minute winter	SW79	8.000	SW80	21.6	1.228	1.216	0.0849	
15 minute winter	SW80	8.001	SW81	24.6	0.805	0.613	0.5284	
15 minute winter	SW81	8.002	SW82	30.0	0.820	0.749	0.7713	
15 minute winter	SW82	8.003	SW83	42.8	1.077	1.067	0.1658	
15 minute winter	SW84	22.000	SW35	24.4	1.202	0.273	0.5886	
15 minute winter	SW85	24.000	SW44	15.5	1.795	0.379	0.2120	
15 minute winter	SW86	25.000	SW45	21.9	1.936	0.552	0.2495	
15 minute winter	SW87	27.000	SW48	58.0	1.485	0.524	1.6128	
15 minute winter	SW88	16.000	SW89	7.5	0.947	0.423	0.3868	
15 minute winter	SW89	16.001	SW58	102.5	1.436	0.519	4.6447	
15 minute winter	SW91	17.000	SW89	42.9	1.752	0.238	0.8887	
15 minute winter	SW90	18.000	SW89	43.4	1.728	0.247	0.7637	
15 minute winter	SW92	19.000	SW61	76.9	1.933	1.092	0.5885	
15 minute winter	SW93	30.000	SW94	13.5	0.770	0.762	0.4498	
15 minute winter	SW94	30.001	SW40	32.3	1.834	1.396	0.3811	



Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW95	12	141.378	0.379	22.7	0.6787	0.0000	SURCHARGED
240 minute winter	SW13	104	139.414	0.076	14.3	0.1094	0.0000	OK
15 minute winter	Tank 01	15	141.529	0.429	191.5	46.8343	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW95	29.000	SW67	20.1	0.724	0.505	1.0084	
240 minute winter	SW13	1.023	EXManhole	14.3	1.236	0.234	0.2576	331.0
15 minute winter	Tank 01	20.000	SW62	-191.5	-1.179	-0.154	1.3530	



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Basin 04	720	141.598	1.648	126.8	1747.1170	0.0000	SURCHARGED
720 minute winter	Basin 03	720	141.598	1.498	15.8	117.3199	0.0000	SURCHARGED
720 minute winter	Basin 02	720	141.598	1.648	70.9	1145.1960	0.0000	SURCHARGED
720 minute winter	SW10 (FC)	720	141.598	1.763	65.3	3.9174	0.0000	SURCHARGED
15 minute summer	SW11	16	139.835	0.094	14.3	0.1341	0.0000	OK
1440 minute winter	SW12	540	139.553	0.097	14.3	0.1381	0.0000	OK
120 minute winter	EXManhole	54	139.104	0.074	14.3	0.0000	0.0000	OK
30 minute winter	SW14	22	141.878	0.653	23.9	1.1872	0.0000	SURCHARGED
15 minute winter	SW01	12	143.188	1.213	29.6	2.1726	0.0000	FLOOD RISK
15 minute winter	SW02	12	143.136	1.491	112.8	3.4776	0.0000	FLOOD RISK
15 minute winter	SW03	12	143.007	1.710	205.0	5.5657	0.0000	FLOOD RISK
15 minute winter	SW04	12	142.838	1.715	258.2	3.9350	0.0000	FLOOD RISK
15 minute winter	SW05	12	142.448	1.655	429.5	4.1736	0.0000	FLOOD RISK
15 minute winter	SW06	13	142.077	1.416	450.7	3.2451	0.0000	SURCHARGED
30 minute winter	SW07	22	141.877	1.262	407.3	2.6007	0.0000	SURCHARGED
30 minute winter	SW08	24	141.739	1.218	514.5	3.1123	0.0000	SURCHARGED
30 minute winter	Basin 01	27	141.696	1.196	510.5	254.1666	0.0000	SURCHARGED
30 minute winter	1	27	141.667	1.080	35.4	2.3358	0.0000	FLOOD RISK
30 minute winter	2	27	141.668	1.139	32.7	2.0125	0.0000	FLOOD RISK
30 minute winter	3	27	141.667	1.186	210.9	2.0963	0.0000	FLOOD RISK
720 minute winter	4	720	141.598	1.264	43.6	2.2332	0.0000	FLOOD RISK
720 minute winter	5	720	141.598	1.284	51.4	2.2685	0.0000	SURCHARGED
720 minute winter	6	720	141.598	1.309	55.5	2.3127	0.0000	SURCHARGED
720 minute winter	7	720	141.598	1.452	68.8	2.5655	0.0000	FLOOD RISK
720 minute winter	8	720	141.598	1.501	68.7	2.6522	0.0000	FLOOD RISK
720 minute winter	9	720	141.598	1.522	68.5	2.6893	0.0000	FLOOD RISK
720 minute winter	10	720	141.598	1.547	68.3	2.7335	0.0000	FLOOD RISK
720 minute winter	SW09	720	141.598	1.602	71.1	3.7615	0.0000	FLOOD RISK
30 minute winter	SW15	22	141.865	0.720	35.8	1.1111	0.0000	SURCHARGED
30 minute winter	SW16	22	141.870	0.970	47.7	1.5034	0.0000	SURCHARGED
30 minute winter	SW17	22	141.845	0.985	84.3	1.3775	0.0000	SURCHARGED
15 minute winter	SW83	13	142.159	0.987	54.3	1.5238	0.0000	SURCHARGED
15 minute winter	SW19	12	142.390	1.351	41.8	2.8675	0.0000	FLOOD RISK
15 minute winter	SW20	12	142.299	1.356	51.4	2.5161	0.0000	FLOOD RISK
15 minute winter	SW21	13	142.020	1.244	74.4	2.2800	0.0000	FLOOD RISK
15 minute winter	SW22	13	141.728	1.030	86.6	1.5988	0.0000	SURCHARGED
15 minute winter	SW18	13	142.490	1.136	15.7	1.7048	0.0000	FLOOD RISK
720 minute winter	SW23	720	141.598	0.573	2.3	1.0340	0.0000	SURCHARGED
720 minute winter	SW24	720	141.598	0.765	4.5	1.3591	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)
720 minute winter	Basin 04	15.019	SW10 (FC)	37.9	0.546	0.042	4.3537	
720 minute winter	Basin 03	31.000	SW10 (FC)	-15.8	-0.134	-0.020	4.1883	
720 minute winter	Basin 02	1.019	SW10 (FC)	16.2	0.343	0.053	5.6496	
720 minute winter	SW10 (FC)	Hydro-Brake®	SW11	14.3				
15 minute summer	SW11	1.021	SW12	14.3	0.897	0.356	0.7598	
1440 minute winter	SW12	1.022	SW13	14.3	1.018	0.356	0.2775	
30 minute winter	SW14	9.000	SW15	22.0	1.062	0.550	0.5330	
15 minute winter	SW01	2.000	SW02	25.6	1.007	0.637	1.1983	
15 minute winter	SW02	1.002	SW03	92.1	1.138	0.653	6.0289	
15 minute winter	SW03	1.003	SW04	193.9	1.244	0.850	5.5290	
15 minute winter	SW04	1.004	SW05	254.6	1.607	1.117	8.0854	
15 minute winter	SW05	1.005	SW06	426.1	1.973	1.529	8.5631	
15 minute winter	SW06	1.006	SW07	446.9	2.069	1.603	2.9746	
30 minute winter	SW07	1.007	SW08	404.8	1.874	1.169	3.9627	
30 minute winter	SW08	1.008	Basin 01	510.5	2.364	2.389	2.3020	
30 minute winter	Basin 01	1.009	3	210.9	1.205	0.980	2.0739	
30 minute winter	1	10.000	2	-25.3	0.398	-0.117	6.2297	
30 minute winter	2	10.001	3	-32.7	0.296	-0.152	5.0934	
30 minute winter	3	1.010	4	210.0	0.972	0.975	15.8644	
720 minute winter	4	1.011	5	43.4	0.565	0.203	2.1789	
720 minute winter	5	1.012	6	51.2	0.668	0.239	2.7207	
720 minute winter	6	1.013	7	55.3	0.566	0.257	15.3990	
720 minute winter	7	1.014	8	68.7	0.563	0.320	5.3382	
720 minute winter	8	1.015	9	68.5	0.549	0.317	2.2569	
720 minute winter	9	1.016	10	68.3	0.571	0.316	2.6760	
720 minute winter	10	1.017	SW09	68.2	0.694	0.317	5.9552	
720 minute winter	SW09	1.018	Basin 02	70.9	1.418	0.185	1.5801	
30 minute winter	SW15	9.001	SW17	33.5	1.423	0.342	0.2373	
30 minute winter	SW16	8.005	SW17	45.5	0.646	0.628	0.6493	
30 minute winter	SW17	8.006	SW08	81.8	1.162	1.127	1.8637	
15 minute winter	SW83	8.004	SW16	50.5	1.270	1.137	1.0679	
15 minute winter	SW19	11.001	SW20	34.0	0.884	0.848	0.6375	
15 minute winter	SW20	11.002	SW21	47.5	1.194	1.184	1.1104	
15 minute winter	SW21	11.003	SW22	69.8	1.754	1.739	0.5170	
15 minute winter	SW22	11.004	5	82.1	2.065	2.048	0.5490	
15 minute winter	SW18	11.000	SW19	11.4	0.946	0.642	0.4225	
720 minute winter	SW23	12.000	SW24	2.3	0.403	0.057	1.2748	
720 minute winter	SW24	12.001	SW25	4.1	0.771	0.102	0.2973	



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	SW25	720	141.598	0.810	4.7	1.0747	0.0000	SURCHARGED
15 minute winter	SW26	12	142.215	1.190	44.7	2.5311	0.0000	FLOOD RISK
15 minute winter	SW27	12	142.020	1.258	125.3	3.9050	0.0000	FLOOD RISK
15 minute winter	SW28	12	141.758	1.073	134.1	1.6718	0.0000	SURCHARGED
720 minute winter	SW29	720	141.598	1.003	14.3	1.9095	0.0000	SURCHARGED
720 minute winter	SW30	720	141.598	1.070	0.8	1.4637	0.0000	FLOOD RISK
720 minute winter	SW31	720	141.598	1.127	0.7	1.2746	0.0000	FLOOD RISK
15 minute winter	11	13	143.004	1.888	111.1	3.3360	0.0000	SURCHARGED
15 minute winter	12	13	142.970	1.960	215.1	3.4638	0.0000	SURCHARGED
15 minute winter	13	13	142.873	1.936	219.2	3.4205	0.0000	SURCHARGED
15 minute winter	14	13	142.821	1.910	223.2	3.3750	0.0000	SURCHARGED
15 minute winter	SW37	13	142.774	1.884	405.8	5.5537	0.0000	SURCHARGED
15 minute winter	16	13	142.618	1.749	399.7	3.0904	0.0000	SURCHARGED
15 minute winter	17	13	142.017	1.303	397.9	2.3018	0.0000	SURCHARGED
15 minute winter	SW38	13	141.911	1.277	437.3	3.2384	0.0000	SURCHARGED
15 minute winter	19	13	141.840	1.213	433.7	2.1437	0.0000	SURCHARGED
15 minute winter	20	14	141.623	1.168	743.1	2.0645	0.0000	SURCHARGED
720 minute winter	21	720	141.598	1.262	105.5	2.2298	0.0000	SURCHARGED
15 minute winter	SW32	13	143.416	1.241	38.4	2.4667	0.0000	FLOOD RISK
15 minute winter	SW33	13	143.375	1.377	39.2	2.1354	0.0000	FLOOD RISK
15 minute winter	SW34	13	143.357	1.485	56.6	3.0284	0.0000	FLOOD RISK
15 minute winter	SW35	13	143.297	1.580	127.4	3.6543	0.0000	SURCHARGED
15 minute winter	SW36	13	143.159	1.502	113.3	2.3645	0.0000	SURCHARGED
15 minute winter	SW41	13	143.324	1.499	22.7	2.8313	0.0000	FLOOD RISK
15 minute winter	SW42	13	143.307	1.696	50.1	3.5843	0.0000	FLOOD RISK
15 minute winter	SW43	13	143.294	1.731	43.5	2.5727	0.0000	FLOOD RISK
15 minute winter	SW44	13	143.268	1.800	59.6	2.9390	0.0000	FLOOD RISK
15 minute winter	SW45	13	143.225	1.813	89.9	3.1916	0.0000	SURCHARGED
15 minute winter	SW46	13	143.081	1.760	115.8	3.3569	0.0000	SURCHARGED
15 minute winter	SW47	12	143.055	1.155	65.5	2.9094	0.0000	SURCHARGED
15 minute winter	SW48	12	142.987	1.339	174.2	3.0731	0.0000	SURCHARGED
720 minute winter	SW39	720	141.598	1.298	105.5	2.7088	0.0000	SURCHARGED
720 minute winter	SW40	720	141.598	1.598	127.2	4.6773	0.0000	SURCHARGED
15 minute winter	SW49	13	143.102	0.982	18.3	1.4908	0.0000	SURCHARGED
15 minute winter	SW50	13	143.091	1.167	75.6	2.8764	0.0000	SURCHARGED
15 minute winter	SW51	13	143.021	1.323	91.2	2.5373	0.0000	FLOOD RISK
15 minute winter	SW52	13	142.991	1.369	122.2	2.9825	0.0000	FLOOD RISK
15 minute winter	SW53	13	142.899	1.504	135.8	2.8235	0.0000	FLOOD RISK
15 minute winter	SW54	13	142.853	1.548	152.6	3.3695	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	SW25	12.002	6	4.7	1.035	0.055	0.2998	
15 minute winter	SW26	13.000	SW27	37.5	0.944	0.936	1.2504	
15 minute winter	SW27	13.001	SW28	115.1	1.635	1.591	1.2675	
15 minute winter	SW28	13.002	SW29	131.1	1.862	1.813	1.4788	
720 minute winter	SW29	13.003	7	15.9	1.154	0.091	0.6449	
720 minute winter	SW30	14.000	SW31	0.7	0.436	0.038	0.1004	
720 minute winter	SW31	14.001	SW09	0.6	0.375	0.033	0.2282	
15 minute winter	11	21.005	12	108.5	0.604	0.503	11.4022	
15 minute winter	12	21.006	13	219.2	1.015	1.015	7.8467	
15 minute winter	13	21.007	14	223.2	1.033	1.037	2.8430	
15 minute winter	14	21.008	SW37	229.0	1.060	1.067	2.2813	
15 minute winter	SW37	21.009	16	399.7	1.850	1.862	2.2811	
15 minute winter	16	21.010	17	397.9	1.842	1.845	16.6911	
15 minute winter	17	21.011	SW38	397.4	1.840	1.846	0.6481	
15 minute winter	SW38	21.012	19	433.7	1.540	1.418	0.8450	
15 minute winter	19	21.013	20	431.3	1.531	1.406	13.5974	
15 minute winter	20	15.015	21	743.0	2.082	1.786	21.3212	
720 minute winter	21	15.016	SW39	104.0	1.128	0.248	6.3378	
15 minute winter	SW32	21.000	SW33	33.9	1.091	0.846	0.6768	
15 minute winter	SW33	21.001	SW34	32.3	0.824	0.376	1.4816	
15 minute winter	SW34	21.002	SW35	47.7	0.800	0.556	1.8251	
15 minute winter	SW35	21.003	SW36	105.4	1.683	1.230	0.7052	
15 minute winter	SW36	21.004	11	111.1	2.578	0.560	0.7015	
15 minute winter	SW41	23.000	SW42	16.3	0.858	0.407	0.9221	
15 minute winter	SW42	23.001	SW43	41.0	0.937	0.478	0.5641	
15 minute winter	SW43	23.002	SW44	38.0	0.692	0.486	1.3473	
15 minute winter	SW44	23.003	SW45	59.7	0.849	0.763	0.7896	
15 minute winter	SW45	23.004	SW46	88.5	1.256	1.129	1.2795	
15 minute winter	SW46	23.005	12	110.8	1.830	0.824	0.4149	
15 minute winter	SW47	26.000	SW48	57.7	1.185	0.672	2.0864	
15 minute winter	SW48	26.001	SW37	142.0	1.699	0.603	4.8578	
720 minute winter	SW39	15.017	SW40	105.0	0.914	0.116	11.4233	
720 minute winter	SW40	15.018	Basin 04	126.8	1.600	0.180	3.1396	
15 minute winter	SW49	15.000	SW50	16.9	0.448	0.197	2.3065	
15 minute winter	SW50	15.001	SW51	68.1	1.294	0.794	1.7731	
15 minute winter	SW51	15.002	SW52	87.2	1.015	0.618	1.6819	
15 minute winter	SW52	15.003	SW53	113.3	1.355	0.803	3.3581	
15 minute winter	SW53	15.004	SW54	112.1	0.924	0.603	4.3193	
15 minute winter	SW54	15.005	SW55	138.6	1.067	0.746	3.1842	



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW55	13	142.796	1.559	158.5	2.9924	0.0000	FLOOD RISK
15 minute winter	SW56	13	142.691	1.646	189.1	4.2935	0.0000	FLOOD RISK
15 minute winter	SW57	13	142.627	1.689	207.0	3.7959	0.0000	FLOOD RISK
15 minute winter	SW58	13	142.553	1.709	367.9	4.9094	0.0000	SURCHARGED
15 minute winter	SW59	13	142.386	1.592	369.0	2.9610	0.0000	SURCHARGED
15 minute winter	SW60	13	142.226	1.476	386.2	3.1845	0.0000	SURCHARGED
15 minute winter	SW61	13	142.079	1.362	490.7	2.8745	0.0000	SURCHARGED
15 minute winter	SW62	15	141.887	1.221	549.6	3.8347	0.0000	SURCHARGED
15 minute winter	SW63	14	141.700	1.085	375.0	2.5973	0.0000	SURCHARGED
15 minute winter	SW64	12	142.930	1.605	42.2	3.1395	0.0000	FLOOD RISK
15 minute winter	SW65	12	142.805	1.646	64.8	3.4376	0.0000	FLOOD RISK
15 minute winter	SW66	12	142.158	1.260	92.2	2.5686	0.0000	FLOOD RISK
15 minute winter	SW67	12	141.770	0.996	132.3	1.6508	0.0000	SURCHARGED
720 minute winter	SW68	720	141.598	0.966	13.4	1.4142	0.0000	SURCHARGED
15 minute winter	SW69	13	143.302	1.249	23.9	2.0782	0.0000	FLOOD RISK
15 minute winter	SW70	13	143.272	1.345	48.6	2.5031	0.0000	FLOOD RISK
15 minute winter	SW71	12	143.038	1.311	37.9	2.2005	0.0000	FLOOD RISK
15 minute winter	SW72	12	143.021	1.440	32.7	2.1653	0.0000	FLOOD RISK
15 minute winter	SW73	12	142.882	1.357	34.6	2.5832	0.0000	FLOOD RISK
15 minute winter	SW74	12	142.699	1.224	41.6	2.5183	0.0000	FLOOD RISK
15 minute winter	SW75	12	142.574	1.376	102.2	3.9935	0.0000	FLOOD RISK
15 minute winter	SW76	12	142.633	1.416	43.5	2.9726	0.0000	FLOOD RISK
15 minute winter	SW77	12	142.559	1.433	62.1	2.6058	0.0000	FLOOD RISK
15 minute winter	SW78	13	141.917	0.888	24.6	1.5173	0.0000	SURCHARGED
15 minute winter	SW79	12	142.473	0.957	32.1	1.8062	0.0000	SURCHARGED
15 minute winter	SW80	13	142.368	0.975	29.5	1.2255	0.0000	SURCHARGED
15 minute winter	SW81	13	142.328	1.015	39.0	1.4762	0.0000	SURCHARGED
15 minute winter	SW82	13	142.227	1.030	54.0	1.8620	0.0000	SURCHARGED
15 minute winter	SW84	13	143.333	0.908	32.1	1.6769	0.0000	SURCHARGED
15 minute winter	SW85	13	143.334	1.084	21.4	1.7723	0.0000	FLOOD RISK
15 minute winter	SW86	13	143.401	1.151	30.9	2.1382	0.0000	FLOOD RISK
15 minute winter	SW87	12	143.065	1.114	76.8	3.0737	0.0000	SURCHARGED
15 minute winter	SW88	13	142.717	0.867	10.7	1.1857	0.0000	SURCHARGED
15 minute winter	SW89	13	142.668	1.263	141.4	2.4329	0.0000	SURCHARGED
15 minute winter	SW91	12	142.693	0.843	56.0	2.0651	0.0000	SURCHARGED
15 minute winter	SW90	12	142.692	0.942	57.3	2.3346	0.0000	SURCHARGED
15 minute winter	SW92	12	142.611	1.324	113.4	4.8419	0.0000	FLOOD RISK
15 minute winter	SW93	12	142.202	1.052	21.4	1.7194	0.0000	FLOOD RISK
15 minute winter	SW94	12	141.939	1.045	43.3	1.9083	0.0000	SURCHARGED

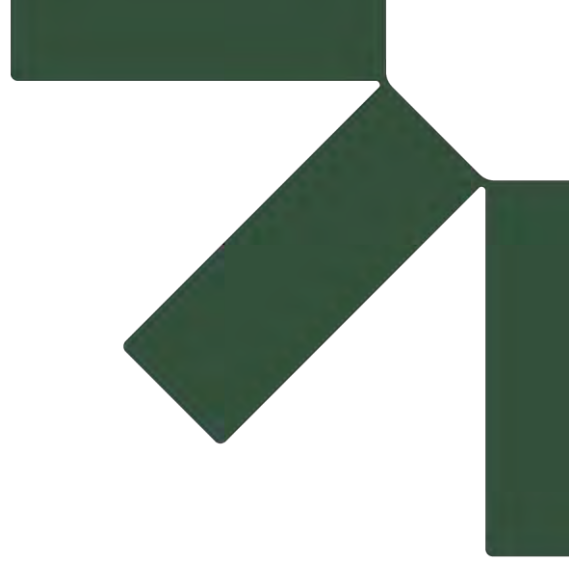
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW55	15.006	SW56	156.4	1.171	0.842	5.5457	
15 minute winter	SW56	15.007	SW57	187.4	0.868	0.672	6.9133	
15 minute winter	SW57	15.008	SW58	206.2	0.955	0.740	6.0818	
15 minute winter	SW58	15.009	SW59	364.1	1.685	1.506	4.2958	
15 minute winter	SW59	15.010	SW60	366.5	1.696	1.520	3.8192	
15 minute winter	SW60	15.011	SW61	383.4	1.775	1.591	2.8335	
15 minute winter	SW61	15.012	SW62	487.6	2.257	2.023	4.4004	
15 minute winter	SW62	15.013	SW63	370.7	1.716	1.634	4.9664	
15 minute winter	SW63	15.014	20	378.2	1.751	1.392	0.6816	
15 minute winter	SW64	28.000	SW65	31.7	0.830	0.789	1.0998	
15 minute winter	SW65	28.001	SW66	59.7	1.502	1.489	1.7340	
15 minute winter	SW66	28.002	SW67	89.7	2.256	2.237	0.3287	
15 minute winter	SW67	28.003	SW68	132.8	1.885	1.545	1.6641	
720 minute winter	SW68	28.004	SW40	13.1	0.811	0.134	2.3238	
15 minute winter	SW69	1.000	SW70	18.0	0.651	0.450	0.8343	
15 minute winter	SW70	1.001	SW02	45.2	1.161	1.126	0.8754	
15 minute winter	SW71	3.000	SW72	18.0	0.934	0.449	0.4717	
15 minute winter	SW72	3.001	SW03	32.1	0.989	0.313	1.1126	
15 minute winter	SW73	4.000	SW04	25.6	1.203	0.459	0.6122	
15 minute winter	SW74	5.000	SW75	31.0	1.020	0.732	1.2030	
15 minute winter	SW75	5.001	SW05	88.6	1.461	0.722	1.0393	
15 minute winter	SW76	6.000	SW77	32.5	0.817	0.810	0.6042	
15 minute winter	SW77	6.001	SW05	54.4	1.369	1.357	0.2231	
15 minute winter	SW78	7.000	SW07	18.4	1.045	1.036	0.0692	
15 minute winter	SW79	8.000	SW80	24.1	1.371	1.359	0.0849	
15 minute winter	SW80	8.001	SW81	25.5	0.803	0.637	0.5284	
15 minute winter	SW81	8.002	SW82	34.7	0.872	0.864	0.7713	
15 minute winter	SW82	8.003	SW83	48.4	1.218	1.208	0.1658	
15 minute winter	SW84	22.000	SW35	29.6	1.198	0.331	0.8538	
15 minute winter	SW85	24.000	SW44	18.2	1.882	0.443	0.2120	
15 minute winter	SW86	25.000	SW45	25.5	1.885	0.642	0.2495	
15 minute winter	SW87	27.000	SW48	69.1	1.493	0.625	1.6128	
15 minute winter	SW88	16.000	SW89	9.1	0.923	0.511	0.3868	
15 minute winter	SW89	16.001	SW58	109.6	1.435	0.554	4.6447	
15 minute winter	SW91	17.000	SW89	53.0	1.742	0.294	0.9966	
15 minute winter	SW90	18.000	SW89	54.4	1.719	0.309	0.7637	
15 minute winter	SW92	19.000	SW61	96.3	2.421	1.368	0.5885	
15 minute winter	SW93	30.000	SW94	16.9	0.959	0.951	0.4498	
15 minute winter	SW94	30.001	SW40	40.1	2.280	1.736	0.3811	



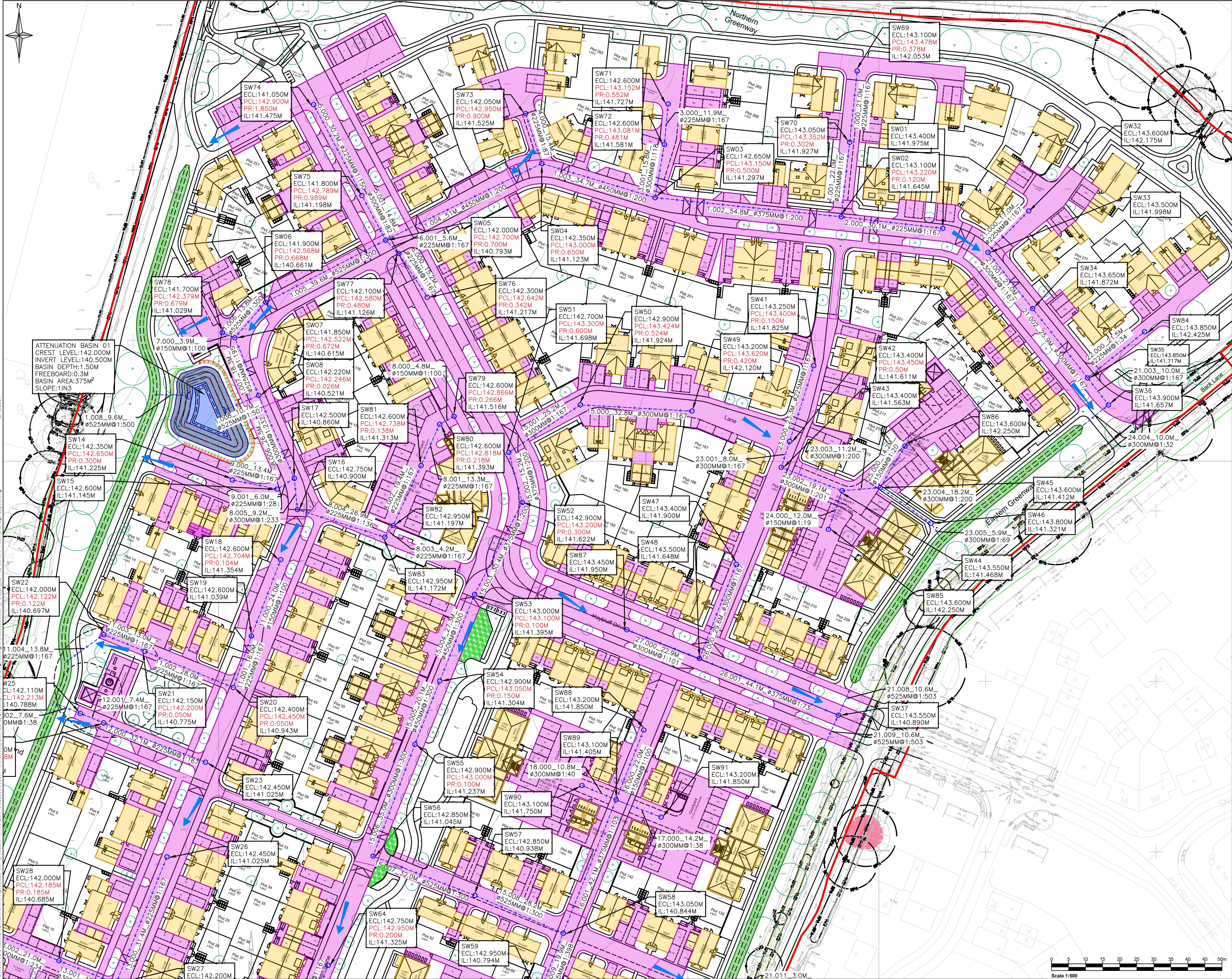
Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW95	12	141.834	0.835	29.6	1.4950	0.0000	SURCHARGED
120 minute winter	SW13	54	139.414	0.076	14.3	0.1094	0.0000	OK
15 minute winter	Tank 01	15	141.892	0.792	315.3	86.5606	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW95	29.000	SW67	23.9	0.731	0.598	1.0084	
120 minute winter	SW13	1.023	EXManhole	14.3	1.236	0.234	0.2576	254.6
15 minute winter	Tank 01	20.000	SW62	-315.3	-1.802	-0.254	1.4440	



Appendix G Drainage Drawings



- Notes:
- DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND SLR DRAINAGE STRATEGY.
 - DRAINAGE STRATEGY IS SUBJECT TO DETAILED DESIGN INCLUDING LEVELS.
 - ALL LEVELS ARE SHOWN IN METRES ABOVE ORDNANCE DATUM.
 - PROPOSED OUTFALL CONNECTION TO EXISTING MANHOLE SUBJECT TO CCTV SURVEY.
 - DRAINAGE STRATEGY DESIGN ATTENUATES SURFACE WATER RUNOFF FOR THE 1 IN 100 YEAR EVENT PLUS 40% CLIMATE CHANGE.
 - DISPLAYED ACRONYMS:
 - ECL - EXISTING COVER LEVEL
 - PCL - PROPOSED COVER LEVEL
 - PR - PROPOSED RAISING OF GROUND LEVELS
 - IL - INVERT LEVEL

- Legend:
- SITE BOUNDARY
 - EXISTING PUBLIC SURFACE WATER SEWER
 - PROPOSED SURFACE WATER DRAIN
 - PROPOSED HEADWALL
 - PROPOSED PERFORATED DRAIN
 - PROPOSED SWALE
 - PROPOSED RAIN GARDEN
 - PROPOSED ATTENUATION TANK
 - PROPOSED ATTENUATION BASIN
 - PROPOSED FLOOD EXCEEDANCE ROUTE
 - PROPOSED IMPERMEABLE PAVED SURFACE AREA (3.045HA)
 - PROPOSED IMPERMEABLE ROOF SURFACE AREA (1.852HA)
 - TREE ROOT PROTECTION ZONE

P02	ARCHITECT LAYOUT UPDATED	12/12/24	HE	NB	NB
Rev	Amendments	Date	By	Chk	Auth



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Drawing Status & Suitability Code

FOR INFORMATION

Client
CROUDACE HOMES

Project
LAND AT ROUNDWOOD, STEVENAGE

Drawing Title
SURFACE WATER DRAINAGE LAYOUT SHEET 1

Scale 1:500	@ A1	SLR Project No. 416.065599.00001
Designed HE	Drawn HE	Checked NB
HE	HE	NB
Date NOV 2024	Date NOV 2024	Date NOV 2024
NOV 2024	NOV 2024	NOV 2024

Drawing Number
416.065599.00001_PDL_01

Rev
P02



Notes:

- DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND SLR DRAINAGE STRATEGY
- DRAINAGE STRATEGY IS SUBJECT TO DETAILED DESIGN INCLUDING LEVELS
- ALL LEVELS ARE SHOWN IN METRES ABOVE ORDNANCE DATUM
- PROPOSED OUTFALL CONNECTION TO EXISTING MANHOLE SUBJECT TO CCTV SURVEY
- DRAINAGE STRATEGY DESIGN ATTENUATES SURFACE WATER RUNOFF FOR THE 1 IN 100 YEAR EVENT PLUS 40% CLIMATE CHANGE
- DISPLAYED ACRONYMS:
 - ECL - EXISTING COVER LEVEL
 - PCL - PROPOSED COVER LEVEL
 - PR - PROPOSED RAISING OF GROUND LEVELS
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Legend:

- SITE BOUNDARY
- EXISTING PUBLIC SURFACE WATER SEWER
- PROPOSED SURFACE WATER DRAIN
- PROPOSED HEADWALL
- PROPOSED PERFORATED DRAIN
- PROPOSED SWALE
- PROPOSED RAIN GARDEN
- PROPOSED ATTENUATION TANK
- PROPOSED ATTENUATION BASIN
- PROPOSED FLOOD EXCEEDANCE ROUTE
- PROPOSED IMPERMEABLE PAVED SURFACE AREA (3.045HA)
- PROPOSED IMPERMEABLE ROOF SURFACE AREA (1.852HA)
- TREE ROOT PROTECTION ZONE

P02	ARCHITECT LAYOUT UPDATED	12.12.24	HE	NB	NB
Rev	Amendments	Date	By	Chk	Auth

SLR

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Drawing Status & Suitability Code

FOR INFORMATION

Client
CROUDACE HOMES

Project
LAND AT ROUNDWOOD, STEVENAGE

Drawing Title
SURFACE WATER DRAINAGE LAYOUT SHEET 2

Scale 1:500	@ A1	SLR Project No. 416.065599.00001
Designed HE	Drawn HE	Checked NB
Date NOV 2024	Date NOV 2024	Date NOV 2024

Drawing Number
416.065599.00001_PDL_02

Rev
P02