
Technical Note

Project: Bridge Farm, Twyford

SMA Ref: 7236.TN07

Subject: Drainage Updates

Prepared by: M Potter

Date: 01/09/2025

Checked by: J O'Kelly

Date: 01/09/2025

1.0 INTRODUCTION

- 1.1. This Technical Note has been produced by Stuart Michael Associates (SMA) on behalf of Croudace Homes following changes to the layout at Bridge Farm, Twyford.

2.0 DRAINAGE UPDATES

- 2.1. Changes to the layout include plots 191-200 and the immediate area.
- 2.2. As a result of the layout amendments, the drainage strategy and associated information has been updated.
- 2.3. The updated drainage strategy is included as **Appendix A**. The locations of manholes S50 and S51 have been moved northwards to suit the new access road location. The associated foul sewers and private foul has also been amended in line with the relocated access road and the updated layout for plots 191-200.
- 2.4. Updated surface water calculations are included as **Appendix B**. Amendments to the calculations are for the locations of S50 and S51 and the associated manhole invert levels, pipe gradients and impermeable area draining to these manholes.
- 2.5. Updated exceedance routes are included as **Appendix C**. These exceedance route arrows have been updated in the vicinity of plots 191-200 to suit the relocated access road.
- 2.6. An updated levels strategy is included as **Appendix D**. The FFLs for plots 191-200 have been moved and updated to suit the new locations of these plots.

Appendix A

Drainage Strategy Drawing



- KEY**
- SITE BOUNDARY
 - EXISTING FOUL WATER SEWER
 - SURFACE WATER SEWER
 - FOUL WATER DRAIN
 - EXISTING SEWER EASEMENT
 - BIORETENTION AREA
 - SWALE WITH UNDERGRAIN
 - ROOT PROTECTION
 - MODELLED 1% AEP + 35% CLIMATE CHANGE FLOOD EXTENT
 - APPROXIMATE LEVEL DIFFERENCE FROM EXISTING TO PROPOSED (m)

- DRAINAGE STRATEGY :**
- SURFACE WATER DRAINAGE STRATEGY BASED ON NO INFILTRATION POSSIBLE ACROSS THE SITE DUE TO HIGH GROUNDWATER LEVELS AND INSUFFICIENT FREEBOARD BETWEEN THE BASIN AND GROUNDWATER LEVELS.
 - DISCHARGE TO RIVER LODDON TO GREENFIELD RUNOFF RATE OF 2/3/70, BASED ON A PROPOSED IMPERMEABLE AREA OF 3.528ha. PEAK FLOW RATE FROM SITE WILL BE RESTRICTED TO 7.0/s.
 - MAIN ATTENUATION STORAGE PROVIDED WITHIN AN ATTENUATION BASIN. ROADSIDE SLOPS FEATURES ACROSS THE SITE INCLUDE SWALES AND BIORETENTION.
 - FOUL DISCHARGE BASED ON THREE SEPARATE OUTFALLS INTO THE EXISTING THAMES WATER FOUL WATER SEWER NETWORK WITHIN THE SITE.

SURFACE WATER DETAILS
IMPERMEABLE AREA
= 3.528ha
GREENFIELD RATE
= 2/3/70
DISCHARGE RATE
= 7.0/s

C	ROADS 191-200 UPDATED	JOK	01.09.25
F	MINOR ROADSIDE SLOPS UPDATES	JOK	06.05.25
E	MINOR LEVEL UPDATES	JOK	07.03.25
D	MINOR LAYOUT UPDATES ADDITIONAL LEVELS ADDED	JOK	03.03.25
B	ATTENUATION CANALS RELOCATED	JOK	24.01.25
A	MINOR DRAINAGE UPDATES	JOK	11.11.24
A	OFFLINE STORAGE ADDED	JOK	08.11.24
Rev	Description	Rev	Rev
1	NEWWORK	1	NEWWORK
2	NEWWORK	2	NEWWORK
3	NEWWORK	3	NEWWORK
4	NEWWORK	4	NEWWORK
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Appendix B

Surface Water Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	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	✓
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)
S1	0.077	5.00	37.900	1500	478385.873	176880.873	1.800
S2	0.064	5.00	38.450	1200	478381.030	176823.865	1.500
S3	0.082	5.00	38.260	1500	478405.554	176834.281	2.260
S4	0.075	5.00	38.500	1500	478415.166	176811.416	2.550
S5	0.068	5.00	38.620	1500	478407.389	176792.004	2.710
S6	0.069	5.00	38.700	1500	478411.499	176776.486	2.820
S7	0.129	5.00	38.140	1500	478363.729	176756.339	2.355
S7A			38.240	1500	478334.288	176743.922	2.510
S8	0.096	5.00	38.050	1500	478359.852	176875.236	1.980
S9	0.065	5.00	38.660	1500	478307.338	176841.152	2.700
S10	0.023	5.00	39.100	1200	478271.658	176820.212	1.500
S11	0.037	5.00	39.000	1500	478281.411	176824.325	3.100
S12	0.058	5.00	38.950	1200	478337.495	176798.666	1.500
S12A			39.140	1200	478305.008	176784.965	1.840
S13	0.077	5.00	39.220	1500	478299.068	176782.460	3.420
S14	0.147	5.00	38.360	1500	478318.185	176737.131	2.660
S15	0.046	5.00	38.980	1200	478246.501	176803.844	1.500
S16	0.119	5.00	38.660	1200	478235.902	176782.097	1.500
S17	0.055	5.00	37.840	1200	478263.097	176717.615	1.500
S18	0.084	5.00	37.850	1500	478264.428	176714.459	2.250
S19	0.106	5.00	37.940	1500	478236.336	176702.612	2.400
S20	0.026	5.00	38.050	1200	478217.802	176709.437	1.500
S21	0.013	5.00	38.100	1500	478225.966	176699.647	2.580
S22	0.030	5.00	37.900	1500	478216.776	176690.869	2.410
S22A	0.052	5.00	37.400	1500	478193.751	176682.121	1.960
S23	0.060	5.00	38.460	1200	478167.550	176737.865	1.500
S24	0.050	5.00	37.960	1200	478138.460	176725.605	1.500
S25	0.033	5.00	36.820	1200	478150.265	176675.908	1.500
S26	0.036	5.00	36.800	1500	478162.659	176670.308	1.850
S27			36.500	1500	478168.324	176647.477	1.650
HW1			36.000		478187.476	176639.243	1.200
S28	0.065	5.00	36.220	2100	478482.199	176515.555	1.550
S29	0.047	5.00	36.360	1800	478453.065	176513.424	1.740
S30	0.031	5.00	36.230	1800	478424.043	176504.113	1.660
S31	0.007	5.00	36.400	1800	478413.539	176510.987	1.850
S32	0.042	5.00	37.300	1500	478398.231	176547.283	2.820
S33	0.173	5.00	37.340	1350	478456.121	176640.918	1.940
S34	0.046	5.00	36.880	1500	478467.912	176595.077	2.260
S35	0.113	5.00	36.840	1500	478466.246	176584.245	2.240
S36	0.054	5.00	36.860	1500	478460.038	176578.288	2.280
S37	0.103	5.00	37.380	1500	478411.106	176557.651	2.895
S38	0.015	5.00	37.500	1500	478398.924	176556.867	3.040

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S39	0.024	5.00	37.680	1500	478390.017	176565.331	3.240
S40	0.164	5.00	37.760	1500	478369.775	176613.328	3.410
S41	0.120	5.00	37.700	1200	478446.995	176676.398	1.550
S42	0.082	5.00	38.020	1200	478439.087	176707.142	2.020
S43	0.082	5.00	38.450	1200	478428.104	176746.837	1.500
S44	0.087	5.00	38.100	1350	478437.107	176711.836	2.280
S45	0.150	5.00	37.520	1500	478390.745	176692.283	3.020
S46	0.048	5.00	37.200	1500	478359.683	176679.183	2.775
S47	0.038	5.00	37.200	1500	478349.943	176670.650	2.800
S48	0.006	5.00	37.300	1500	478350.404	176659.259	2.920
S50	0.061	5.00	37.600	1500	478359.743	176637.115	3.300
S51	0.206	5.00	36.300	1500	478306.790	176614.782	2.100
S52			36.300	1500	478284.942	176619.529	2.140
HW2			36.000		478273.374	176621.910	1.860
Basin			36.000		478225.715	176627.022	2.000
S53			36.000	1500	478222.035	176616.371	2.050
S54			35.450	1200	478209.599	176597.260	1.650
Outfall			35.400	1200	478207.589	176593.371	1.650

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S3	50.578	0.600	36.100	36.000	0.100	505.8	600	5.78	47.4
2.000	S2	S3	26.644	0.600	36.950	36.300	0.650	41.0	300	5.18	49.7
1.001	S3	S4	24.803	0.600	36.000	35.950	0.050	496.1	600	6.16	46.0
1.002	S4	S5	20.912	0.600	35.950	35.910	0.040	522.8	600	6.49	44.9
1.003	S5	S6	16.053	0.600	35.910	35.880	0.030	535.1	600	6.75	44.1
1.004	S6	S7	51.845	0.600	35.880	35.785	0.095	545.7	600	7.58	41.6
3.000	S8	S9	62.605	0.600	36.070	35.960	0.110	569.1	600	6.03	46.5
3.001	S9	S11	30.909	0.600	35.960	35.900	0.060	515.1	600	6.51	44.9
4.000	S10	S11	10.585	0.600	37.600	36.200	1.400	7.6	300	5.03	50.0
3.002	S11	S13	45.436	0.600	35.900	35.800	0.100	454.4	600	7.18	42.8
8.000	S23	S24	31.568	0.600	36.960	36.460	0.500	63.1	300	5.27	49.4
5.000	S12	S12A	35.258	0.600	37.450	37.300	0.150	235.1	300	5.58	48.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.076	304.1	13.2	1.200	1.660	0.077	0.0	84	0.548
2.000	2.462	174.1	11.5	1.200	1.660	0.064	0.0	52	1.413
1.001	1.086	307.1	37.1	1.660	1.950	0.223	0.0	139	0.743
1.002	1.058	299.1	48.4	1.950	2.110	0.298	0.0	162	0.786
1.003	1.045	295.6	58.3	2.110	2.220	0.366	0.0	180	0.821
1.004	1.035	292.7	65.4	2.220	1.755	0.435	0.0	192	0.841
3.000	1.013	286.5	16.1	1.380	2.100	0.096	0.0	95	0.556
3.001	1.066	301.3	26.1	2.100	2.500	0.161	0.0	118	0.664
4.000	5.751	406.5	4.2	1.200	2.500	0.023	0.0	21	1.901
3.002	1.136	321.1	34.2	2.500	2.820	0.221	0.0	131	0.751
8.000	1.982	140.1	10.7	1.200	1.200	0.060	0.0	55	1.181
5.000	1.021	72.2	10.1	1.200	1.540	0.058	0.0	75	0.724

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)
3.003	S13	S14	49.195	0.600	35.800	35.700	0.100	492.0	600	7.93	40.6
1.007	S14	S18	58.342	0.600	35.700	35.600	0.100	583.4	600	9.38	37.2
6.000	S15	S16	24.192	0.600	37.480	37.160	0.320	75.6	300	5.22	49.5
6.001	S16	S17	69.982	0.600	37.160	36.340	0.820	85.3	300	5.91	46.9
6.002	S17	S18	3.425	0.600	36.340	35.900	0.440	7.8	300	5.92	46.9
1.008	S18	S19	30.488	0.600	35.600	35.540	0.060	508.1	600	9.85	36.2
1.009	S19	S21	10.786	0.600	35.540	35.520	0.020	539.3	600	10.02	35.9
7.000	S20	S21	12.747	0.600	36.550	35.820	0.730	17.5	300	5.06	50.0
1.010	S21	S22	12.709	0.600	35.520	35.490	0.030	423.6	600	10.20	35.5
1.011	S22	S22A	24.631	0.600	35.490	35.440	0.050	492.6	600	10.58	34.8
8.001	S24	S25	51.080	0.600	36.460	35.320	1.140	44.8	300	5.63	48.0
8.002	S25	S26	13.600	0.600	35.320	35.250	0.070	194.3	300	5.83	47.2
1.013	S26	S27	23.523	0.600	34.950	34.850	0.100	235.2	600	11.02	34.0
1.014	S27	HW1	20.847	0.600	34.850	34.800	0.050	416.9	600	11.31	33.5
10.000	S28	S29	29.212	0.600	34.670	34.620	0.050	584.2	600	5.49	48.5
10.001	S29	S30	30.479	0.600	34.620	34.570	0.050	609.6	600	6.01	46.5
10.002	S30	S31	12.553	0.600	34.570	34.550	0.020	627.7	600	6.22	45.8
10.003	S31	S32	39.392	0.600	34.550	34.480	0.070	562.7	600	6.87	43.7
10.004	S32	S38	9.609	0.600	34.480	34.460	0.020	480.5	600	7.01	43.2
9.000	S33	S34	47.333	0.600	35.400	34.770	0.630	75.1	450	5.34	49.1
9.001	S34	S35	10.959	0.600	34.620	34.600	0.020	548.0	600	5.51	48.4
9.002	S35	S36	8.604	0.600	34.600	34.580	0.020	430.2	600	5.64	48.0
9.003	S36	S37	53.106	0.600	34.580	34.485	0.095	559.0	600	6.50	44.9

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)
3.003	1.091	308.4	52.3	2.820	2.060	0.356	0.0	166	0.822
1.007	1.001	282.9	143.6	2.060	1.650	1.067	0.0	303	1.004
6.000	1.810	127.9	8.2	1.200	1.200	0.046	0.0	51	1.030
6.001	1.703	120.4	28.0	1.200	1.200	0.165	0.0	98	1.396
6.002	5.668	400.6	37.3	1.200	1.650	0.220	0.0	61	3.592
1.008	1.073	303.4	179.5	1.650	1.800	1.371	0.0	333	1.116
1.009	1.041	294.4	191.5	1.800	1.980	1.477	0.0	353	1.105
7.000	3.780	267.2	4.7	1.200	1.980	0.026	0.0	27	1.458
1.010	1.177	332.7	194.7	1.980	1.810	1.516	0.0	330	1.220
1.011	1.090	308.2	194.6	1.810	1.360	1.546	0.0	347	1.150
8.001	2.355	166.4	19.1	1.200	1.200	0.110	0.0	68	1.585
8.002	1.124	79.5	24.4	1.200	1.250	0.143	0.0	114	0.993
1.013	1.583	447.6	218.5	1.250	1.050	1.777	0.0	296	1.574
1.014	1.186	335.3	215.4	1.050	0.600	1.777	0.0	351	1.256
10.000	1.000	282.7	11.4	0.950	1.140	0.065	0.0	81	0.498
10.001	0.979	276.7	18.8	1.140	1.060	0.112	0.0	105	0.568
10.002	0.964	272.7	23.7	1.060	1.250	0.143	0.0	118	0.600
10.003	1.019	288.2	23.7	1.250	2.220	0.150	0.0	115	0.625
10.004	1.104	312.2	30.0	2.220	2.440	0.192	0.0	125	0.709
9.000	2.347	373.3	30.7	1.490	1.660	0.173	0.0	87	1.443
9.001	1.033	292.1	38.3	1.660	1.640	0.219	0.0	146	0.724
9.002	1.167	330.1	57.5	1.640	1.680	0.332	0.0	168	0.885
9.003	1.023	289.1	62.6	1.680	2.295	0.386	0.0	188	0.823

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)
9.004	S37	S38	12.207	0.600	34.485	34.460	0.025	488.3	600	6.69	44.3
9.005	S38	S39	12.287	0.600	34.460	34.440	0.020	614.4	600	7.22	42.6
9.006	S39	S40	52.091	0.600	34.440	34.350	0.090	578.8	600	8.09	40.2
9.007	S40	S50	25.816	0.600	34.350	34.300	0.050	516.3	600	8.49	39.3
11.000	S41	S42	31.745	0.600	36.150	36.000	0.150	211.6	300	5.49	48.5
11.001	S42	S44	5.095	0.600	36.000	35.970	0.030	169.8	300	5.56	48.2
12.000	S43	S44	36.140	0.600	36.950	35.970	0.980	36.9	300	5.23	49.5
11.002	S44	S45	50.317	0.600	35.820	34.650	1.170	43.0	450	5.83	47.2
11.003	S45	S46	33.711	0.600	34.500	34.425	0.075	449.5	600	6.32	45.5
11.004	S46	S47	12.949	0.600	34.425	34.400	0.025	518.0	600	6.53	44.8
11.005	S47	S48	11.400	0.600	34.400	34.380	0.020	570.0	600	6.71	44.2
9.008	S50	S51	57.470	0.600	34.300	34.200	0.100	574.7	600	9.44	37.1
9.009	S51	S52	22.358	0.600	34.200	34.160	0.040	558.9	600	9.80	36.3
9.010	S52	HW2	11.810	0.600	34.160	34.140	0.020	590.5	600	10.00	35.9
9.011	HW2	Basin	47.932	0.600	34.140	34.000	0.140	342.4	600	10.61	34.8
1.016	Basin	S53	11.269	0.600	34.000	33.950	0.050	225.4	600	11.62	33.0
1.017	S53	S54	22.801	0.600	33.950	33.800	0.150	152.0	225	11.98	32.4
1.018	S54	Outfall	4.378	0.600	33.800	33.750	0.050	87.6	225	12.03	32.4
1.015	HW1	Basin	40.144	0.600	34.800	34.000	0.800	50.2	600	11.50	33.2
1.012	S22A	S26	33.260	0.600	35.440	34.950	0.490	67.9	600	10.77	34.5
5.001	S12A	S13	6.447	0.600	37.300	36.100	1.200	5.4	300	5.59	48.1
1.005	S7	S7A	31.952	0.600	35.785	35.730	0.055	581.0	600	8.12	40.2

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)
9.004	1.095	309.6	78.2	2.295	2.440	0.489	0.0	205	0.920
9.005	0.975	275.6	107.2	2.440	2.640	0.696	0.0	259	0.916
9.006	1.005	284.1	104.7	2.640	2.810	0.720	0.0	252	0.932
9.007	1.065	301.0	125.4	2.810	2.700	0.884	0.0	270	1.018
11.000	1.077	76.1	21.0	1.250	1.720	0.120	0.0	108	0.924
11.001	1.203	85.1	35.2	1.720	1.830	0.202	0.0	134	1.149
12.000	2.597	183.6	14.7	1.200	1.830	0.082	0.0	57	1.578
11.002	3.106	494.1	63.3	1.830	2.420	0.371	0.0	108	2.162
11.003	1.142	322.8	85.7	2.420	2.175	0.521	0.0	210	0.972
11.004	1.063	300.5	92.2	2.175	2.200	0.569	0.0	227	0.939
11.005	1.013	286.3	97.0	2.200	2.320	0.607	0.0	240	0.918
9.008	1.008	285.1	208.8	2.700	1.500	1.558	0.0	383	1.097
9.009	1.023	289.2	231.5	1.500	1.540	1.764	0.0	408	1.131
9.010	0.995	281.2	228.9	1.540	1.260	1.764	0.0	413	1.103
9.011	1.310	370.4	221.7	1.260	1.400	1.764	0.0	335	1.366
1.016	1.618	457.4	422.7	1.400	1.450	3.541	0.0	458	1.823
1.017	1.058	42.1	415.1	1.825	1.425	3.541	0.0	225	1.077
1.018	1.398	55.6	414.1	1.425	1.425	3.541	0.0	225	1.424
1.015	3.443	973.4	213.4	0.600	1.400	1.777	0.0	190	2.785
1.012	2.958	836.4	199.2	1.360	1.250	1.598	0.0	198	2.445
5.001	6.825	482.4	10.1	1.540	2.820	0.058	0.0	30	2.782
1.005	1.003	283.6	81.9	1.755	1.910	0.564	0.0	220	0.873

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.006	S7A	S14	17.476	0.600	35.730	35.700	0.030	582.5	600	8.41	39.5
11.006	S48	S50	24.033	0.600	34.380	34.300	0.080	300.4	600	7.00	43.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.006	1.001	283.2	80.4	1.910	2.060	0.564	0.0	218	0.867
11.006	1.399	395.7	95.8	2.320	2.700	0.613	0.0	200	1.163

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	50.578	505.8	600	Circular	37.900	36.100	1.200	38.260	36.000	1.660
2.000	26.644	41.0	300	Circular	38.450	36.950	1.200	38.260	36.300	1.660
1.001	24.803	496.1	600	Circular	38.260	36.000	1.660	38.500	35.950	1.950
1.002	20.912	522.8	600	Circular	38.500	35.950	1.950	38.620	35.910	2.110
1.003	16.053	535.1	600	Circular	38.620	35.910	2.110	38.700	35.880	2.220
1.004	51.845	545.7	600	Circular	38.700	35.880	2.220	38.140	35.785	1.755
3.000	62.605	569.1	600	Circular	38.050	36.070	1.380	38.660	35.960	2.100
3.001	30.909	515.1	600	Circular	38.660	35.960	2.100	39.000	35.900	2.500
4.000	10.585	7.6	300	Circular	39.100	37.600	1.200	39.000	36.200	2.500
3.002	45.436	454.4	600	Circular	39.000	35.900	2.500	39.220	35.800	2.820
8.000	31.568	63.1	300	Circular	38.460	36.960	1.200	37.960	36.460	1.200
5.000	35.258	235.1	300	Circular	38.950	37.450	1.200	39.140	37.300	1.540
3.003	49.195	492.0	600	Circular	39.220	35.800	2.820	38.360	35.700	2.060
1.007	58.342	583.4	600	Circular	38.360	35.700	2.060	37.850	35.600	1.650
6.000	24.192	75.6	300	Circular	38.980	37.480	1.200	38.660	37.160	1.200
6.001	69.982	85.3	300	Circular	38.660	37.160	1.200	37.840	36.340	1.200
6.002	3.425	7.8	300	Circular	37.840	36.340	1.200	37.850	35.900	1.650

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1500	Manhole	Adoptable	S3	1500	Manhole	Adoptable
2.000	S2	1200	Manhole	Adoptable	S3	1500	Manhole	Adoptable
1.001	S3	1500	Manhole	Adoptable	S4	1500	Manhole	Adoptable
1.002	S4	1500	Manhole	Adoptable	S5	1500	Manhole	Adoptable
1.003	S5	1500	Manhole	Adoptable	S6	1500	Manhole	Adoptable
1.004	S6	1500	Manhole	Adoptable	S7	1500	Manhole	Adoptable
3.000	S8	1500	Manhole	Adoptable	S9	1500	Manhole	Adoptable
3.001	S9	1500	Manhole	Adoptable	S11	1500	Manhole	Adoptable
4.000	S10	1200	Manhole	Adoptable	S11	1500	Manhole	Adoptable
3.002	S11	1500	Manhole	Adoptable	S13	1500	Manhole	Adoptable
8.000	S23	1200	Manhole	Adoptable	S24	1200	Manhole	Adoptable
5.000	S12	1200	Manhole	Adoptable	S12A	1200	Manhole	Adoptable
3.003	S13	1500	Manhole	Adoptable	S14	1500	Manhole	Adoptable
1.007	S14	1500	Manhole	Adoptable	S18	1500	Manhole	Adoptable
6.000	S15	1200	Manhole	Adoptable	S16	1200	Manhole	Adoptable
6.001	S16	1200	Manhole	Adoptable	S17	1200	Manhole	Adoptable
6.002	S17	1200	Manhole	Adoptable	S18	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)
1.008	30.488	508.1	600	Circular	37.850	35.600	1.650	37.940	35.540	1.800
1.009	10.786	539.3	600	Circular	37.940	35.540	1.800	38.100	35.520	1.980
7.000	12.747	17.5	300	Circular	38.050	36.550	1.200	38.100	35.820	1.980
1.010	12.709	423.6	600	Circular	38.100	35.520	1.980	37.900	35.490	1.810
1.011	24.631	492.6	600	Circular	37.900	35.490	1.810	37.400	35.440	1.360
8.001	51.080	44.8	300	Circular	37.960	36.460	1.200	36.820	35.320	1.200
8.002	13.600	194.3	300	Circular	36.820	35.320	1.200	36.800	35.250	1.250
1.013	23.523	235.2	600	Circular	36.800	34.950	1.250	36.500	34.850	1.050
1.014	20.847	416.9	600	Circular	36.500	34.850	1.050	36.000	34.800	0.600
10.000	29.212	584.2	600	Circular	36.220	34.670	0.950	36.360	34.620	1.140
10.001	30.479	609.6	600	Circular	36.360	34.620	1.140	36.230	34.570	1.060
10.002	12.553	627.7	600	Circular	36.230	34.570	1.060	36.400	34.550	1.250
10.003	39.392	562.7	600	Circular	36.400	34.550	1.250	37.300	34.480	2.220
10.004	9.609	480.5	600	Circular	37.300	34.480	2.220	37.500	34.460	2.440
9.000	47.333	75.1	450	Circular	37.340	35.400	1.490	36.880	34.770	1.660
9.001	10.959	548.0	600	Circular	36.880	34.620	1.660	36.840	34.600	1.640
9.002	8.604	430.2	600	Circular	36.840	34.600	1.640	36.860	34.580	1.680
9.003	53.106	559.0	600	Circular	36.860	34.580	1.680	37.380	34.485	2.295
9.004	12.207	488.3	600	Circular	37.380	34.485	2.295	37.500	34.460	2.440
9.005	12.287	614.4	600	Circular	37.500	34.460	2.440	37.680	34.440	2.640
9.006	52.091	578.8	600	Circular	37.680	34.440	2.640	37.760	34.350	2.810
9.007	25.816	516.3	600	Circular	37.760	34.350	2.810	37.600	34.300	2.700
11.000	31.745	211.6	300	Circular	37.700	36.150	1.250	38.020	36.000	1.720
11.001	5.095	169.8	300	Circular	38.020	36.000	1.720	38.100	35.970	1.830
12.000	36.140	36.9	300	Circular	38.450	36.950	1.200	38.100	35.970	1.830

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.008	S18	1500	Manhole	Adoptable	S19	1500	Manhole	Adoptable
1.009	S19	1500	Manhole	Adoptable	S21	1500	Manhole	Adoptable
7.000	S20	1200	Manhole	Adoptable	S21	1500	Manhole	Adoptable
1.010	S21	1500	Manhole	Adoptable	S22	1500	Manhole	Adoptable
1.011	S22	1500	Manhole	Adoptable	S22A	1500	Manhole	Adoptable
8.001	S24	1200	Manhole	Adoptable	S25	1200	Manhole	Adoptable
8.002	S25	1200	Manhole	Adoptable	S26	1500	Manhole	Adoptable
1.013	S26	1500	Manhole	Adoptable	S27	1500	Manhole	Adoptable
1.014	S27	1500	Manhole	Adoptable	HW1		Junction	
10.000	S28	2100	Manhole	Adoptable	S29	1800	Manhole	Adoptable
10.001	S29	1800	Manhole	Adoptable	S30	1800	Manhole	Adoptable
10.002	S30	1800	Manhole	Adoptable	S31	1800	Manhole	Adoptable
10.003	S31	1800	Manhole	Adoptable	S32	1500	Manhole	Adoptable
10.004	S32	1500	Manhole	Adoptable	S38	1500	Manhole	Adoptable
9.000	S33	1350	Manhole	Adoptable	S34	1500	Manhole	Adoptable
9.001	S34	1500	Manhole	Adoptable	S35	1500	Manhole	Adoptable
9.002	S35	1500	Manhole	Adoptable	S36	1500	Manhole	Adoptable
9.003	S36	1500	Manhole	Adoptable	S37	1500	Manhole	Adoptable
9.004	S37	1500	Manhole	Adoptable	S38	1500	Manhole	Adoptable
9.005	S38	1500	Manhole	Adoptable	S39	1500	Manhole	Adoptable
9.006	S39	1500	Manhole	Adoptable	S40	1500	Manhole	Adoptable
9.007	S40	1500	Manhole	Adoptable	S50	1500	Manhole	Adoptable
11.000	S41	1200	Manhole	Adoptable	S42	1200	Manhole	Adoptable
11.001	S42	1200	Manhole	Adoptable	S44	1350	Manhole	Adoptable
12.000	S43	1200	Manhole	Adoptable	S44	1350	Manhole	Adoptable

Pipeline Schedule

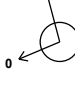
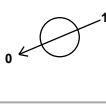
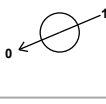
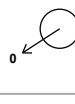
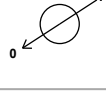
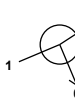
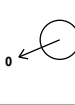
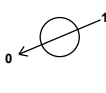
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.002	50.317	43.0	450	Circular	38.100	35.820	1.830	37.520	34.650	2.420
11.003	33.711	449.5	600	Circular	37.520	34.500	2.420	37.200	34.425	2.175
11.004	12.949	518.0	600	Circular	37.200	34.425	2.175	37.200	34.400	2.200
11.005	11.400	570.0	600	Circular	37.200	34.400	2.200	37.300	34.380	2.320
9.008	57.470	574.7	600	Circular	37.600	34.300	2.700	36.300	34.200	1.500
9.009	22.358	558.9	600	Circular	36.300	34.200	1.500	36.300	34.160	1.540
9.010	11.810	590.5	600	Circular	36.300	34.160	1.540	36.000	34.140	1.260
9.011	47.932	342.4	600	Circular	36.000	34.140	1.260	36.000	34.000	1.400
1.016	11.269	225.4	600	Circular	36.000	34.000	1.400	36.000	33.950	1.450
1.017	22.801	152.0	225	Circular	36.000	33.950	1.825	35.450	33.800	1.425
1.018	4.378	87.6	225	Circular	35.450	33.800	1.425	35.400	33.750	1.425
1.015	40.144	50.2	600	Circular	36.000	34.800	0.600	36.000	34.000	1.400
1.012	33.260	67.9	600	Circular	37.400	35.440	1.360	36.800	34.950	1.250
5.001	6.447	5.4	300	Circular	39.140	37.300	1.540	39.220	36.100	2.820
1.005	31.952	581.0	600	Circular	38.140	35.785	1.755	38.240	35.730	1.910
1.006	17.476	582.5	600	Circular	38.240	35.730	1.910	38.360	35.700	2.060
11.006	24.033	300.4	600	Circular	37.300	34.380	2.320	37.600	34.300	2.700

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.002	S44	1350	Manhole	Adoptable	S45	1500	Manhole	Adoptable
11.003	S45	1500	Manhole	Adoptable	S46	1500	Manhole	Adoptable
11.004	S46	1500	Manhole	Adoptable	S47	1500	Manhole	Adoptable
11.005	S47	1500	Manhole	Adoptable	S48	1500	Manhole	Adoptable
9.008	S50	1500	Manhole	Adoptable	S51	1500	Manhole	Adoptable
9.009	S51	1500	Manhole	Adoptable	S52	1500	Manhole	Adoptable
9.010	S52	1500	Manhole	Adoptable	HW2		Junction	
9.011	HW2		Junction		Basin		Junction	
1.016	Basin		Junction		S53	1500	Manhole	Adoptable
1.017	S53	1500	Manhole	Adoptable	S54	1200	Manhole	Adoptable
1.018	S54	1200	Manhole	Adoptable	Outfall	1200	Manhole	Adoptable
1.015	HW1		Junction		Basin		Junction	
1.012	S22A	1500	Manhole	Adoptable	S26	1500	Manhole	Adoptable
5.001	S12A	1200	Manhole	Adoptable	S13	1500	Manhole	Adoptable
1.005	S7	1500	Manhole	Adoptable	S7A	1500	Manhole	Adoptable
1.006	S7A	1500	Manhole	Adoptable	S14	1500	Manhole	Adoptable
11.006	S48	1500	Manhole	Adoptable	S50	1500	Manhole	Adoptable

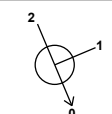
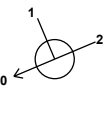
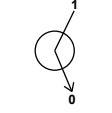
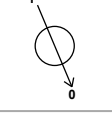
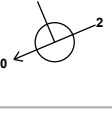
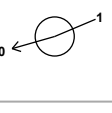
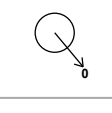
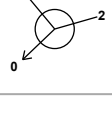
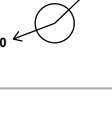
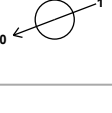
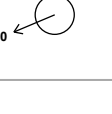
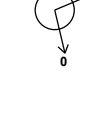
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	478385.873	176880.873	37.900	1.800	1500				
							0 1.000	36.100	600

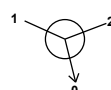
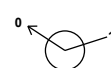
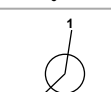
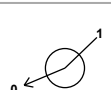
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S2	478381.030	176823.865	38.450	1.500	1200		0	2.000	36.950	300
S3	478405.554	176834.281	38.260	2.260	1500		1	2.000	36.300	300
							2	1.000	36.000	600
							0	1.001	36.000	600
S4	478415.166	176811.416	38.500	2.550	1500		1	1.001	35.950	600
							0	1.002	35.950	600
S5	478407.389	176792.004	38.620	2.710	1500		1	1.002	35.910	600
							0	1.003	35.910	600
S6	478411.499	176776.486	38.700	2.820	1500		1	1.003	35.880	600
							0	1.004	35.880	600
S7	478363.729	176756.339	38.140	2.355	1500		1	1.004	35.785	600
							0	1.005	35.785	600
S7A	478334.288	176743.922	38.240	2.510	1500		1	1.005	35.730	600
							0	1.006	35.730	600
S8	478359.852	176875.236	38.050	1.980	1500		0	3.000	36.070	600
S9	478307.338	176841.152	38.660	2.700	1500		1	3.000	35.960	600
							0	3.001	35.960	600
S10	478271.658	176820.212	39.100	1.500	1200		0	4.000	37.600	300
S11	478281.411	176824.325	39.000	3.100	1500		1	4.000	36.200	300
							2	3.001	35.900	600
							0	3.002	35.900	600
S12	478337.495	176798.666	38.950	1.500	1200		0	5.000	37.450	300
							1	5.000	37.300	300
S12A	478305.008	176784.965	39.140	1.840	1200		0	5.001	37.300	300

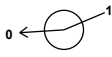
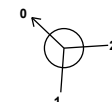
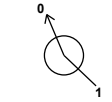
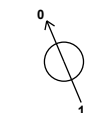
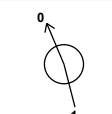
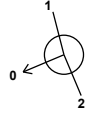
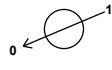
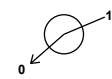
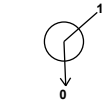
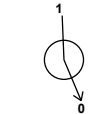
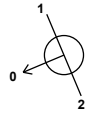
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S13	478299.068	176782.460	39.220	3.420	1500		1 5.001 2 3.002 0 3.003	36.100 35.800 35.800	300 600 600
S14	478318.185	176737.131	38.360	2.660	1500		1 3.003 2 1.006 0 1.007	35.700 35.700 35.700	600 600 600
S15	478246.501	176803.844	38.980	1.500	1200		0 6.000	37.480	300
S16	478235.902	176782.097	38.660	1.500	1200		1 6.000 0 6.001	37.160 37.160	300 300
S17	478263.097	176717.615	37.840	1.500	1200		1 6.001 0 6.002	36.340 36.340	300 300
S18	478264.428	176714.459	37.850	2.250	1500		1 6.002 2 1.007 0 1.008	35.900 35.600 35.600	300 600 600
S19	478236.336	176702.612	37.940	2.400	1500		1 1.008 0 1.009	35.540 35.540	600 600
S20	478217.802	176709.437	38.050	1.500	1200		0 7.000	36.550	300
S21	478225.966	176699.647	38.100	2.580	1500		1 7.000 2 1.009 0 1.010	35.820 35.520 35.520	300 600 600
S22	478216.776	176690.869	37.900	2.410	1500		1 1.010 0 1.011	35.490 35.490	600 600
S22A	478193.751	176682.121	37.400	1.960	1500		1 1.011 0 1.012	35.440 35.440	600 600
S23	478167.550	176737.865	38.460	1.500	1200		0 8.000	36.960	300
S24	478138.460	176725.605	37.960	1.500	1200		1 8.000 0 8.001	36.460 36.460	300 300

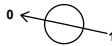
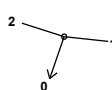
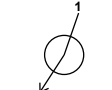
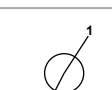
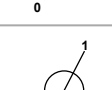
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S25	478150.265	176675.908	36.820	1.500	1200		1 0	8.001 8.002	35.320 35.320	300 300
S26	478162.659	176670.308	36.800	1.850	1500		1 2 0	8.002 1.012 1.013	35.250 34.950 34.950	300 600 600
S27	478168.324	176647.477	36.500	1.650	1500		1 0	1.013 1.014	34.850 34.850	600 600
HW1	478187.476	176639.243	36.000	1.200			1 0	1.014 1.015	34.800 34.800	600 600
S28	478482.199	176515.555	36.220	1.550	2100		0	10.000	34.670	600
S29	478453.065	176513.424	36.360	1.740	1800		1 0	10.000 10.001	34.620 34.620	600 600
S30	478424.043	176504.113	36.230	1.660	1800		1 0	10.001 10.002	34.570 34.570	600 600
S31	478413.539	176510.987	36.400	1.850	1800		1 0	10.002 10.003	34.550 34.550	600 600
S32	478398.231	176547.283	37.300	2.820	1500		1 0	10.003 10.004	34.480 34.480	600 600
S33	478456.121	176640.918	37.340	1.940	1350		0	9.000	35.400	450
S34	478467.912	176595.077	36.880	2.260	1500		1 0	9.000 9.001	34.770 34.620	450 600
S35	478466.246	176584.245	36.840	2.240	1500		1 0	9.001 9.002	34.600 34.600	600 600
S36	478460.038	176578.288	36.860	2.280	1500		1 0	9.002 9.003	34.580 34.580	600 600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S37	478411.106	176557.651	37.380	2.895	1500	 1	9.003	34.485	600
						0	9.004	34.485	600
S38	478398.924	176556.867	37.500	3.040	1500	 1	10.004	34.460	600
						2	9.004	34.460	600
						0	9.005	34.460	600
S39	478390.017	176565.331	37.680	3.240	1500	 1	9.005	34.440	600
						0	9.006	34.440	600
S40	478369.775	176613.328	37.760	3.410	1500	 1	9.006	34.350	600
						0	9.007	34.350	600
S41	478446.995	176676.398	37.700	1.550	1200	 0	11.000	36.150	300
						0	11.000	36.150	300
S42	478439.087	176707.142	38.020	2.020	1200	 1	11.000	36.000	300
						0	11.001	36.000	300
S43	478428.104	176746.837	38.450	1.500	1200	 0	12.000	36.950	300
						0	12.000	36.950	300
S44	478437.107	176711.836	38.100	2.280	1350	 1	12.000	35.970	300
						2	11.001	35.970	300
						0	11.002	35.820	450
S45	478390.745	176692.283	37.520	3.020	1500	 1	11.002	34.650	450
						0	11.003	34.500	600
S46	478359.683	176679.183	37.200	2.775	1500	 1	11.003	34.425	600
						0	11.004	34.425	600
S47	478349.943	176670.650	37.200	2.800	1500	 1	11.004	34.400	600
						0	11.005	34.400	600
S48	478350.404	176659.259	37.300	2.920	1500	 1	11.005	34.380	600
						0	11.006	34.380	600
S50	478359.743	176637.115	37.600	3.300	1500	 1	11.006	34.300	600
						2	9.007	34.300	600
						0	9.008	34.300	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S51	478306.790	176614.782	36.300	2.100	1500		1 9.008	34.200	600
						0	9.009	34.200	600
S52	478284.942	176619.529	36.300	2.140	1500		1 9.009	34.160	600
						0	9.010	34.160	600
HW2	478273.374	176621.910	36.000	1.860			1 9.010	34.140	600
						0	9.011	34.140	600
Basin	478225.715	176627.022	36.000	2.000			1 9.011	34.000	600
						2 1.015	34.000	600	
						0	1.016	34.000	600
S53	478222.035	176616.371	36.000	2.050	1500		1 1.016	33.950	600
						0	1.017	33.950	225
S54	478209.599	176597.260	35.450	1.650	1200		1 1.017	33.800	225
						0	1.018	33.800	225
Outfall	478207.589	176593.371	35.400	1.650	1200		1 1.018	33.750	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Node S53 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.017	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0114-7000-1650-7000
Invert Level (m)	33.950	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.650	Min Node Diameter (mm)	1200
Design Flow (l/s)	7.0		

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.000
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	1486.0	0.0	2.000	3644.0	0.0

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	36.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	8

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	170.0	0.0	0.800	170.0	0.0	0.900	0.0	0.0

Node S45 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.550
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	9

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	195.0	0.0	1.600	195.0	0.0	1.650	0.0	0.0

Node S28 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	22

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	96.0	0.0	0.400	96.0	0.0	0.500	0.0	0.0

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S1	22	37.646	1.546	74.1	4.1858	0.0000	FLOOD RISK
30 minute summer	S2	22	37.647	0.697	56.2	1.4424	0.0000	SURCHARGED
30 minute summer	S3	22	37.702	1.702	269.2	4.3658	0.0000	SURCHARGED
30 minute summer	S4	22	37.717	1.767	241.0	4.2657	0.0000	SURCHARGED
30 minute summer	S5	21	37.685	1.775	281.7	4.1170	0.0000	SURCHARGED
30 minute summer	S6	21	37.694	1.814	378.7	4.1808	0.0000	SURCHARGED
30 minute summer	S7	22	37.662	1.877	705.1	142.9352	0.0000	SURCHARGED
30 minute summer	S7A	21	37.637	1.907	348.4	3.3689	0.0000	SURCHARGED
15 minute summer	S8	10	37.672	1.602	93.5	4.5392	0.0000	SURCHARGED
30 minute summer	S9	22	37.607	1.647	225.5	3.7826	0.0000	SURCHARGED
15 minute summer	S10	10	37.647	0.047	22.4	0.0697	0.0000	OK
30 minute summer	S11	22	37.576	1.676	196.8	3.4019	0.0000	SURCHARGED
15 minute summer	S12	10	37.657	0.207	56.5	0.4108	0.0000	OK
30 minute summer	S12A	22	37.559	0.259	50.8	0.2932	0.0000	OK
30 minute summer	S13	22	37.570	1.770	336.8	4.0040	0.0000	SURCHARGED
30 minute summer	S14	21	37.627	1.927	477.8	5.7479	0.0000	SURCHARGED
15 minute summer	S15	12	38.560	1.080	44.8	1.9497	0.0000	SURCHARGED
15 minute summer	S16	12	38.531	1.371	152.4	3.9430	0.0000	FLOOD RISK
15 minute summer	S17	12	37.403	1.063	178.7	2.0610	0.0000	SURCHARGED
30 minute summer	S18	21	37.266	1.666	538.2	4.3116	0.0000	SURCHARGED
30 minute summer	S19	20	36.995	1.455	574.0	3.9842	0.0000	SURCHARGED
15 minute summer	S20	12	36.844	0.294	25.3	0.4452	0.0000	OK
15 minute summer	S21	11	36.848	1.328	567.2	2.4945	0.0000	SURCHARGED
15 minute summer	S22	11	36.676	1.186	581.8	2.4196	0.0000	SURCHARGED
15 minute summer	S22A	11	36.399	0.959	607.3	2.2547	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)
30 minute summer	S1	1.000	S3	75.7	0.356	0.249	14.2467	
30 minute summer	S2	2.000	S3	51.4	1.927	0.295	1.8763	
30 minute summer	S3	1.001	S4	175.3	0.622	0.571	6.9864	
30 minute summer	S4	1.002	S5	222.1	0.788	0.742	5.8904	
30 minute summer	S5	1.003	S6	318.1	1.130	1.076	4.5218	
30 minute summer	S6	1.004	S7	434.3	1.542	1.484	14.6036	
30 minute summer	S7	1.005	S7A	348.4	1.237	1.229	9.0002	
30 minute summer	S7A	1.006	S14	350.7	1.245	1.238	4.9226	
15 minute summer	S8	3.000	S9	174.3	0.658	0.608	17.6344	
30 minute summer	S9	3.001	S11	-173.7	-0.621	-0.576	8.7064	
15 minute summer	S10	4.000	S11	22.4	2.787	0.055	0.4104	
30 minute summer	S11	3.002	S13	226.4	0.804	0.705	12.7983	
15 minute summer	S12	5.000	S12A	55.8	1.770	0.774	1.2183	
30 minute summer	S12A	5.001	S13	50.8	3.121	0.105	0.4356	
30 minute summer	S13	3.003	S14	348.8	1.238	1.131	13.8571	
30 minute summer	S14	1.007	S18	446.4	1.585	1.578	16.4336	
15 minute summer	S15	6.000	S16	41.8	0.797	0.327	1.7036	
15 minute summer	S16	6.001	S17	132.6	2.020	1.102	4.9281	
15 minute summer	S17	6.002	S18	174.9	3.356	0.437	0.2412	
30 minute summer	S18	1.008	S19	537.6	1.909	1.772	8.5878	
30 minute summer	S19	1.009	S21	577.2	2.049	1.960	3.0382	
15 minute summer	S20	7.000	S21	44.3	1.626	0.166	0.8957	
15 minute summer	S21	1.010	S22	573.0	2.035	1.723	3.5798	
15 minute summer	S22	1.011	S22A	586.2	2.081	1.902	6.9380	
15 minute summer	S22A	1.012	S26	606.4	2.153	0.725	9.3686	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S23	10	37.096	0.136	58.5	0.2738	0.0000	OK
15 minute summer	S24	11	36.680	0.220	106.9	0.4108	0.0000	OK
15 minute summer	S25	11	36.289	0.969	131.6	1.5655	0.0000	SURCHARGED
15 minute summer	S26	12	36.025	1.075	754.2	2.3602	0.0000	SURCHARGED
1440 minute winter	S27	1410	35.581	0.731	68.6	1.2920	0.0000	SURCHARGED
1440 minute winter	HW1	1410	35.579	0.779	69.8	0.0000	0.0000	SURCHARGED
30 minute summer	S28	21	36.193	1.523	348.2	47.7670	0.0000	FLOOD RISK
30 minute summer	S29	20	36.210	1.590	302.4	4.9914	0.0000	FLOOD RISK
30 minute summer	S30	21	36.176	1.606	264.3	4.7472	0.0000	FLOOD RISK
30 minute summer	S31	21	36.179	1.629	239.5	4.2815	0.0000	FLOOD RISK
30 minute summer	S32	20	36.165	1.685	235.6	3.5291	0.0000	SURCHARGED
30 minute summer	S33	20	36.459	1.059	151.8	3.5922	0.0000	SURCHARGED
30 minute summer	S34	20	36.404	1.784	179.4	3.9506	0.0000	SURCHARGED
30 minute summer	S35	20	36.392	1.792	256.7	5.1485	0.0000	SURCHARGED
30 minute summer	S36	20	36.363	1.783	298.9	4.0799	0.0000	SURCHARGED
30 minute summer	S37	20	36.240	1.755	384.7	4.4749	0.0000	SURCHARGED
30 minute summer	S38	20	36.167	1.707	428.3	3.2018	0.0000	SURCHARGED
30 minute summer	S39	20	36.064	1.624	434.0	3.1334	0.0000	SURCHARGED
30 minute summer	S40	21	35.815	1.465	527.5	4.1394	0.0000	SURCHARGED
15 minute summer	S41	10	37.022	0.872	116.9	2.4712	0.0000	SURCHARGED
15 minute summer	S42	10	36.609	0.609	192.7	1.2327	0.0000	SURCHARGED
15 minute summer	S43	10	37.092	0.142	79.9	0.3324	0.0000	OK
15 minute summer	S44	10	36.116	0.296	355.3	0.6733	0.0000	OK
30 minute summer	S45	23	35.764	1.264	551.5	228.5776	0.0000	SURCHARGED
30 minute summer	S46	23	35.725	1.300	261.1	2.7927	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	S23	8.000	S24	58.2	1.563	0.416	1.3419	
15 minute summer	S24	8.001	S25	99.5	1.525	0.598	3.2154	
15 minute summer	S25	8.002	S26	125.3	1.779	1.576	0.9577	
15 minute summer	S26	1.013	S27	756.1	2.685	1.689	6.6259	
1440 minute winter	S27	1.014	HW1	69.8	1.431	0.208	5.8721	
1440 minute winter	HW1	1.015	Basin	68.5	1.681	0.070	11.3077	
30 minute summer	S28	10.000	S29	-291.2	-1.066	-1.030	8.2284	
30 minute summer	S29	10.001	S30	-261.1	-0.927	-0.944	8.5852	
30 minute summer	S30	10.002	S31	-237.1	-0.842	-0.869	3.5359	
30 minute summer	S31	10.003	S32	-233.4	-0.829	-0.810	11.0958	
30 minute summer	S32	10.004	S38	-198.7	-0.706	-0.637	2.7066	
30 minute summer	S33	9.000	S34	139.0	1.635	0.372	7.4996	
30 minute summer	S34	9.001	S35	157.9	0.561	0.541	3.0869	
30 minute summer	S35	9.002	S36	251.5	0.893	0.762	2.4236	
30 minute summer	S36	9.003	S37	294.4	1.045	1.018	14.9588	
30 minute summer	S37	9.004	S38	382.4	1.358	1.235	3.4384	
30 minute summer	S38	9.005	S39	418.6	1.486	1.519	3.4610	
30 minute summer	S39	9.006	S40	422.5	1.500	1.487	14.6728	
30 minute summer	S40	9.007	S50	513.6	1.823	1.706	7.2718	
15 minute summer	S41	11.000	S42	114.1	1.620	1.499	2.2355	
15 minute summer	S42	11.001	S44	191.4	2.719	2.250	0.3552	
15 minute summer	S43	12.000	S44	79.1	2.373	0.431	1.2126	
15 minute summer	S44	11.002	S45	358.5	3.168	0.726	6.7584	
30 minute summer	S45	11.003	S46	255.0	0.905	0.790	9.4956	
30 minute summer	S46	11.004	S47	263.2	0.934	0.876	3.6474	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S47	22	35.707	1.307	268.0	2.6993	0.0000	SURCHARGED
30 minute summer	S48	22	35.695	1.315	270.7	2.3825	0.0000	SURCHARGED
30 minute summer	S50	22	35.675	1.375	552.6	2.9900	0.0000	SURCHARGED
1440 minute winter	S51	1440	35.575	1.375	47.1	5.3962	0.0000	SURCHARGED
1440 minute winter	S52	1440	35.575	1.415	47.0	2.5000	0.0000	SURCHARGED
1440 minute winter	HW2	1440	35.575	1.435	46.9	0.0000	0.0000	SURCHARGED
1440 minute winter	Basin	1440	35.575	1.575	112.4	3678.2970	0.0000	SURCHARGED
1440 minute winter	S53	1440	35.589	1.639	17.5	2.8954	0.0000	SURCHARGED
360 minute summer	S54	160	33.859	0.059	7.0	0.0669	0.0000	OK
360 minute summer	Outfall	160	33.804	0.054	7.0	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)
30 minute summer	S47	11.005	S48	269.9	0.958	0.943	3.2111	
30 minute summer	S48	11.006	S50	272.3	0.967	0.688	6.7695	
30 minute summer	S50	9.008	S51	534.4	1.897	1.874	16.1880	
1440 minute winter	S51	9.009	S52	47.0	0.543	0.162	6.2977	
1440 minute winter	S52	9.010	HW2	46.9	0.609	0.167	3.3266	
1440 minute winter	HW2	9.011	Basin	46.9	0.979	0.126	13.5014	
1440 minute winter	Basin	1.016	S53	17.5	0.119	0.038	3.1742	
1440 minute winter	S53	1.017	S54	7.0	0.799	0.166	0.1997	
360 minute summer	S54	1.018	Outfall	7.0	0.900	0.126	0.0340	210.1

Appendix C

Exceedance Routes