



APPENDIX 7

SURFACE WATER DRAINAGE 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	✓
Maximum Rainfall (mm/hr)	100.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
23	0.067	5.00	56.402	1200	517787.252	131741.601	1.050
22			56.301	1200	517793.276	131749.771	1.141
21	0.063	5.00	57.390	1200	517901.076	131799.236	1.325
Attenuation Tank 3	0.192	5.00	56.835		517872.778	131820.101	1.197
19	0.053	5.00	56.575	1200	517844.480	131840.965	1.113
18	0.045	5.00	56.442	1200	517832.600	131824.853	1.080
17	0.025	5.00	57.567	1200	517814.862	131857.864	1.300
16	0.014	5.00	56.962	1200	517802.030	131840.458	1.363
15	0.034	5.00	56.725	1200	517747.964	131810.172	0.900
14	0.024	5.00	56.724	1200	517755.709	131820.831	1.106
13	0.010	5.00	57.270	1200	517702.843	131851.495	0.751
12	0.028	5.00	57.583	1200	517710.270	131861.568	1.189
11	0.045	5.00	57.881	1200	517689.080	131896.870	1.425
Attenuation Tank 5	0.075	5.00	57.703		517719.634	131874.421	1.627
9	0.073	5.00	56.961	1200	517768.568	131838.263	1.546
Attenuation Tank 4	0.020	5.00	56.521		517789.197	131823.157	1.288
Attenuation Tank 6	0.041	5.00	56.260		517816.455	131803.052	1.285
Attenuation Tank 2	0.040	5.00	56.071		517799.628	131780.134	1.154
5	0.042	5.00	56.064	1500	517788.912	131765.600	1.240
4	0.045	5.00	56.151	1500	517799.300	131758.038	1.353
Attenuation Tank 1	0.092	5.00	56.220		517822.402	131740.996	1.481
2	0.054	5.00	56.129	2100	517845.504	131723.875	1.473
1			56.060		517849.632	131719.735	1.415
Permeable Paving 1	0.008	5.00	56.310		517816.862	131736.956	0.650
Permeable Paving 2	0.022	5.00	56.475		517822.519	131746.976	0.650
Permeable Paving 3	0.021	5.00	56.000		517786.461	131748.812	0.600
Permeable Paving 4	0.018	5.00	55.900		517784.303	131759.549	0.600
Permeable Paving 5	0.019	5.00	56.890		517871.877	131812.155	0.600
Permeable Paving 6	0.008	5.00	57.270		517880.126	131824.279	0.600
Permeable Paving 7	0.014	5.00	57.145		517863.725	131841.738	0.600
Permeable Paving 8	0.040	5.00	57.000		517804.187	131850.117	0.600
Permeable Paving 9	0.014	5.00	57.675		517705.286	131863.402	0.600
Permeable Paving 10	0.019	5.00	57.250		517698.372	131853.271	0.600
Permeable Paving 11	0.022	5.00	56.600		517748.561	131820.935	0.600
Permeable Paving 12	0.017	5.00	56.585		517741.862	131807.864	0.600
Permeable Paving 13	0.009	5.00	56.780		517738.072	131799.324	0.600
Rain Garden 2	0.032	5.00	56.460		517815.154	131811.493	0.400
Rain Garden 1	0.031	5.00	56.420		517808.257	131801.385	0.400



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)
1.009	2	1	5.846	0.600	54.656	54.645	0.011	531.5	525	9.13	39.6
1.008	Attenuation Tank 1	2	28.755	0.600	54.739	54.656	0.083	346.4	525	9.03	40.7
1.007	4	Attenuation Tank 1	28.708	0.600	54.798	54.739	0.059	490.0	525	8.63	41.7
6.001	22	4	10.229	0.600	55.160	55.099	0.061	167.7	225	5.33	52.9
1.006	5	4	12.849	0.600	54.824	54.798	0.026	490.0	525	8.15	42.9
1.005	Attenuation Tank 2	5	18.057	0.600	54.917	54.824	0.093	194.2	525	7.94	43.5
1.004	Attenuation Tank 6	Attenuation Tank 2	28.432	0.600	54.975	54.917	0.058	490.0	525	7.75	44.0
9.003	18	Attenuation Tank 6	27.128	0.600	55.362	55.201	0.161	168.5	300	6.65	47.5
1.003	Attenuation Tank 4	Attenuation Tank 6	33.870	0.600	55.233	55.125	0.108	315.0	375	7.28	45.4
7.001	16	Attenuation Tank 4	21.541	0.600	55.599	55.470	0.129	167.0	225	5.63	51.3
1.002	9	Attenuation Tank 4	25.568	0.600	55.415	55.308	0.107	240.0	300	6.72	47.2
4.002	14	9	21.662	0.600	55.618	55.490	0.128	169.2	225	5.87	50.3
1.001	Attenuation Tank 5	9	60.843	0.600	56.076	55.502	0.574	106.0	225	6.30	48.7
2.002	12	Attenuation Tank 5	15.902	0.600	56.394	56.151	0.243	65.4	150	5.50	51.9
1.000	11	Attenuation Tank 5	37.915	0.600	56.456	56.076	0.380	99.8	225	5.48	52.0
2.001	13	12	12.515	0.600	56.519	56.394	0.125	100.0	150	5.29	52.8
4.001	15	14	13.176	0.600	55.825	55.693	0.132	99.8	150	5.51	51.9
7.000	17	16	21.625	0.600	56.267	55.649	0.618	35.0	100	5.28	52.8
9.002	19	18	20.018	0.600	55.462	55.362	0.100	200.0	300	6.28	48.8
9.001	Attenuation Tank 3	19	35.158	0.600	55.638	55.462	0.176	200.0	300	5.98	49.9
9.000	21	Attenuation Tank 3	35.159	0.600	56.065	55.713	0.352	100.0	225	5.45	52.1
16.000	23	22	10.151	0.600	55.352	55.235	0.117	86.8	150	5.16	53.3
18.000	Permeable Paving 1	Attenuation Tank 1	6.857	0.600	55.660	55.500	0.160	42.9	100	5.10	53.6
19.000	Permeable Paving 2	Attenuation Tank 1	5.981	0.600	55.825	55.500	0.325	18.4	100	5.06	53.8

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)
1.009	0.964	208.8	197.1	0.948	0.890	1.377	0.0	409	1.090
1.008	1.197	259.2	194.6	0.956	0.948	1.323	0.0	341	1.309
1.007	1.005	217.5	181.0	0.828	0.956	1.201	0.0	367	1.118
6.001	1.007	40.0	16.9	0.916	0.827	0.088	0.0	102	0.963
1.006	1.005	217.5	165.6	0.715	0.828	1.068	0.0	344	1.101
1.005	1.604	347.2	158.4	0.629	0.715	1.008	0.0	249	1.569
1.004	1.005	217.5	154.0	0.760	0.629	0.968	0.0	327	1.086
9.003	1.208	85.4	67.6	0.780	0.759	0.394	0.0	202	1.335
1.003	1.015	112.1	77.0	0.913	0.760	0.469	0.0	229	1.091
7.001	1.009	40.1	14.5	1.138	0.826	0.078	0.0	94	0.930
1.002	1.010	71.4	63.2	1.246	0.913	0.370	0.0	221	1.136
4.002	1.002	39.8	19.4	0.881	1.246	0.107	0.0	111	0.997
1.001	1.269	50.5	33.5	1.402	1.234	0.190	0.0	134	1.355
2.002	1.245	22.0	13.2	1.039	1.402	0.070	0.0	84	1.302
1.000	1.309	52.0	8.4	1.200	1.402	0.045	0.0	61	0.968
2.001	1.005	17.8	5.5	0.601	1.039	0.029	0.0	57	0.886
4.001	1.006	17.8	11.3	0.750	0.881	0.060	0.0	87	1.065
7.000	1.308	10.3	4.7	1.200	1.213	0.025	0.0	47	1.276
9.002	1.108	78.3	61.5	0.813	0.780	0.349	0.0	201	1.222
9.001	1.108	78.3	50.8	0.897	0.813	0.282	0.0	176	1.176
9.000	1.307	52.0	11.8	1.100	0.897	0.063	0.0	73	1.061
16.000	1.079	19.1	12.9	0.900	0.916	0.067	0.0	91	1.158
18.000	1.181	9.3	1.6	0.550	0.620	0.008	0.0	29	0.890
19.000	1.808	14.2	4.2	0.550	0.620	0.022	0.0	37	1.572



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)
17.000	Permeable Paving 3	22	6.882	0.600	55.400	55.285	0.115	59.8	100	5.12	58.5
15.000	Permeable Paving 4	5	7.607	0.600	55.300	55.250	0.050	152.1	100	5.20	58.1
11.000	Permeable Paving 5	Attenuation Tank 3	7.997	0.600	56.290	56.155	0.135	59.2	100	5.13	58.4
10.000	Permeable Paving 6	Attenuation Tank 3	8.453	0.600	56.670	56.527	0.143	59.1	100	5.14	58.4
12.000	Permeable Paving 7	19	19.261	0.600	56.545	56.221	0.324	59.4	100	5.32	52.6
8.000	Permeable Paving 8	16	9.897	0.600	56.400	56.233	0.167	59.3	100	5.16	58.3
3.000	Permeable Paving 9	12	5.311	0.600	57.075	56.859	0.216	24.6	100	5.06	58.8
2.000	Permeable Paving 10	13	4.811	0.600	56.650	56.569	0.081	59.4	100	5.08	58.7
4.000	Permeable Paving 13	15	14.681	0.600	56.180	56.000	0.180	81.6	100	5.29	52.8
5.000	Permeable Paving 12	15	6.524	0.600	55.985	55.900	0.085	76.8	100	5.12	58.5
6.000	Permeable Paving 11	14	7.149	0.600	56.000	55.900	0.100	71.5	100	5.13	58.4
13.000	Rain Garden 2	Attenuation Tank 6	8.541	0.600	56.060	55.879	0.181	47.2	100	5.13	58.5
14.000	Rain Garden 1	Attenuation Tank 6	8.366	0.600	56.020	55.879	0.141	59.3	100	5.14	58.4

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)
17.000	0.997	7.8	4.1	0.500	0.916	0.021	0.0	52	1.013
15.000	0.621	4.9	3.4	0.500	0.714	0.018	0.0	62	0.673
11.000	1.002	7.9	3.7	0.500	0.580	0.019	0.0	48	0.985
10.000	1.003	7.9	1.6	0.500	0.208	0.008	0.0	31	0.790
12.000	1.001	7.9	2.6	0.500	0.254	0.014	0.0	39	0.897
8.000	1.002	7.9	7.6	0.500	0.629	0.040	0.0	79	1.141
3.000	1.563	12.3	2.7	0.500	0.624	0.014	0.0	32	1.249
2.000	1.001	7.9	3.6	0.500	0.601	0.019	0.0	48	0.984
4.000	0.852	6.7	1.7	0.500	0.625	0.009	0.0	35	0.716
5.000	0.879	6.9	3.4	0.500	0.725	0.017	0.0	50	0.876
6.000	0.911	7.2	4.3	0.500	0.724	0.022	0.0	56	0.953
13.000	1.125	8.8	6.2	0.300	0.281	0.032	0.0	61	1.214
14.000	1.002	7.9	6.1	0.300	0.281	0.031	0.0	66	1.105

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)
1.009	5.846	531.5	525	Circular	56.129	54.656	0.948	56.060	54.645	0.890
1.008	28.755	346.4	525	Circular	56.220	54.739	0.956	56.129	54.656	0.948
1.007	28.708	490.0	525	Circular	56.151	54.798	0.828	56.220	54.739	0.956
6.001	10.229	167.7	225	Circular	56.301	55.160	0.916	56.151	55.099	0.827
1.006	12.849	490.0	525	Circular	56.064	54.824	0.715	56.151	54.798	0.828
1.005	18.057	194.2	525	Circular	56.071	54.917	0.629	56.064	54.824	0.715
1.004	28.432	490.0	525	Circular	56.260	54.975	0.760	56.071	54.917	0.629

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.009	2	2100	Manhole	Adoptable	1		Junction	
1.008	Attenuation Tank 1		Junction		2	2100	Manhole	Adoptable
1.007	4	1500	Manhole	Adoptable	Attenuation Tank 1		Junction	
6.001	22	1200	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.006	5	1500	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.005	Attenuation Tank 2		Junction		5	1500	Manhole	Adoptable
1.004	Attenuation Tank 6		Junction		Attenuation Tank 2		Junction	



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)
9.003	27.128	168.5	300	Circular	56.442	55.362	0.780	56.260	55.201	0.759
1.003	33.870	315.0	375	Circular	56.521	55.233	0.913	56.260	55.125	0.760
7.001	21.541	167.0	225	Circular	56.962	55.599	1.138	56.521	55.470	0.826
1.002	25.568	240.0	300	Circular	56.961	55.415	1.246	56.521	55.308	0.913
4.002	21.662	169.2	225	Circular	56.724	55.618	0.881	56.961	55.490	1.246
1.001	60.843	106.0	225	Circular	57.703	56.076	1.402	56.961	55.502	1.234
2.002	15.902	65.4	150	Circular	57.583	56.394	1.039	57.703	56.151	1.402
1.000	37.915	99.8	225	Circular	57.881	56.456	1.200	57.703	56.076	1.402
2.001	12.515	100.0	150	Circular	57.270	56.519	0.601	57.583	56.394	1.039
4.001	13.176	99.8	150	Circular	56.725	55.825	0.750	56.724	55.693	0.881
7.000	21.625	35.0	100	Circular	57.567	56.267	1.200	56.962	55.649	1.213
9.002	20.018	200.0	300	Circular	56.575	55.462	0.813	56.442	55.362	0.780
9.001	35.158	200.0	300	Circular	56.835	55.638	0.897	56.575	55.462	0.813
9.000	35.159	100.0	225	Circular	57.390	56.065	1.100	56.835	55.713	0.897
16.000	10.151	86.8	150	Circular	56.402	55.352	0.900	56.301	55.235	0.916
18.000	6.857	42.9	100	Circular	56.310	55.660	0.550	56.220	55.500	0.620
19.000	5.981	18.4	100	Circular	56.475	55.825	0.550	56.220	55.500	0.620
17.000	6.882	59.8	100	Circular	56.000	55.400	0.500	56.301	55.285	0.916
15.000	7.607	152.1	100	Circular	55.900	55.300	0.500	56.064	55.250	0.714
11.000	7.997	59.2	100	Circular	56.890	56.290	0.500	56.835	56.155	0.580
10.000	8.453	59.1	100	Circular	57.270	56.670	0.500	56.835	56.527	0.208
12.000	19.261	59.4	100	Circular	57.145	56.545	0.500	56.575	56.221	0.254
8.000	9.897	59.3	100	Circular	57.000	56.400	0.500	56.962	56.233	0.629
3.000	5.311	24.6	100	Circular	57.675	57.075	0.500	57.583	56.859	0.624
2.000	4.811	59.4	100	Circular	57.250	56.650	0.500	57.270	56.569	0.601

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
9.003	18	1200	Manhole	Adoptable	Attenuation Tank 6		Junction	
1.003	Attenuation Tank 4		Junction		Attenuation Tank 6		Junction	
7.001	16	1200	Manhole	Adoptable	Attenuation Tank 4		Junction	
1.002	9	1200	Manhole	Adoptable	Attenuation Tank 4		Junction	
4.002	14	1200	Manhole	Adoptable	9	1200	Manhole	Adoptable
1.001	Attenuation Tank 5		Junction		9	1200	Manhole	Adoptable
2.002	12	1200	Manhole	Adoptable	Attenuation Tank 5		Junction	
1.000	11	1200	Manhole	Adoptable	Attenuation Tank 5		Junction	
2.001	13	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
4.001	15	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable
7.000	17	1200	Manhole	Adoptable	16	1200	Manhole	Adoptable
9.002	19	1200	Manhole	Adoptable	18	1200	Manhole	Adoptable
9.001	Attenuation Tank 3		Junction		19	1200	Manhole	Adoptable
9.000	21	1200	Manhole	Adoptable	Attenuation Tank 3		Junction	
16.000	23	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
18.000	Permeable Paving 1		Junction		Attenuation Tank 1		Junction	
19.000	Permeable Paving 2		Junction		Attenuation Tank 1		Junction	
17.000	Permeable Paving 3		Junction		22	1200	Manhole	Adoptable
15.000	Permeable Paving 4		Junction		5	1500	Manhole	Adoptable
11.000	Permeable Paving 5		Junction		Attenuation Tank 3		Junction	
10.000	Permeable Paving 6		Junction		Attenuation Tank 3		Junction	
12.000	Permeable Paving 7		Junction		19	1200	Manhole	Adoptable
8.000	Permeable Paving 8		Junction		16	1200	Manhole	Adoptable
3.000	Permeable Paving 9		Junction		12	1200	Manhole	Adoptable
2.000	Permeable Paving 10		Junction		13	1200	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)
4.000	14.681	81.6	100	Circular	56.780	56.180	0.500	56.725	56.000	0.625
5.000	6.524	76.8	100	Circular	56.585	55.985	0.500	56.725	55.900	0.725
6.000	7.149	71.5	100	Circular	56.600	56.000	0.500	56.724	55.900	0.724
13.000	8.541	47.2	100	Circular	56.460	56.060	0.300	56.260	55.879	0.281
14.000	8.366	59.3	100	Circular	56.420	56.020	0.300	56.260	55.879	0.281

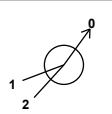
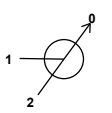
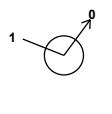
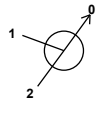
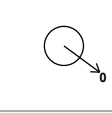
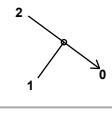
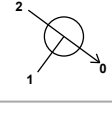
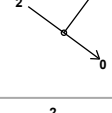
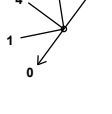
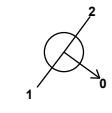
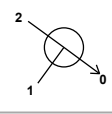
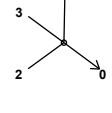
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.000	Permeable Paving 13		Junction	15		1200	Manhole	Adoptable
5.000	Permeable Paving 12		Junction	15		1200	Manhole	Adoptable
6.000	Permeable Paving 11		Junction	14		1200	Manhole	Adoptable
13.000	Rain Garden 2		Junction	Attenuation Tank 6			Junction	
14.000	Rain Garden 1		Junction	Attenuation Tank 6			Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
23	517787.252	131741.601	56.402	1.050	1200				
						0	16.000	55.352	150
22	517793.276	131749.771	56.301	1.141	1200		1	17.000	100
						2	16.000	55.235	150
						0	6.001	55.160	225
21	517901.076	131799.236	57.390	1.325	1200				
						0	9.000	56.065	225
Attenuation Tank 3	517872.778	131820.101	56.835	1.197			1	11.000	100
						2	10.000	56.527	100
						3	9.000	55.713	225
						0	9.001	55.638	300
19	517844.480	131840.965	56.575	1.113	1200		1	12.000	100
						2	9.001	55.462	300
						0	9.002	55.462	300
18	517832.600	131824.853	56.442	1.080	1200		1	9.002	300
						0	9.003	55.362	300
17	517814.862	131857.864	57.567	1.300	1200				
						0	7.000	56.267	100
16	517802.030	131840.458	56.962	1.363	1200		1	8.000	100
						2	7.000	55.649	100
						0	7.001	55.599	225



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
15	517747.964	131810.172	56.725	0.900	1200		1 5.000 2 4.000	55.900 56.000	100 100
14	517755.709	131820.831	56.724	1.106	1200		0 4.001 1 6.000 2 4.001	55.825 55.900 55.693	150 100 150
13	517702.843	131851.495	57.270	0.751	1200		0 4.002 1 2.000	55.618 56.569	225 100
12	517710.270	131861.568	57.583	1.189	1200		0 2.001 1 3.000 2 2.001	56.519 56.859 56.394	150 100 150
11	517689.080	131896.870	57.881	1.425	1200		0 1.000	56.456	225
Attenuation Tank 5	517719.634	131874.421	57.703	1.627			0 1.001 1 2.002 2 1.000	56.076 56.151 56.076	225 150 225
9	517768.568	131838.263	56.961	1.546	1200		0 1.002 1 4.002 2 1.001	55.415 55.490 55.502	300 225 225
Attenuation Tank 4	517789.197	131823.157	56.521	1.288			0 1.003 1 7.001 2 1.002	55.233 55.470 55.308	375 225 300
Attenuation Tank 6	517816.455	131803.052	56.260	1.285			0 1.004 1 14.000 2 13.000 3 9.003 4 1.003	54.975 55.879 55.879 55.201 55.125	525 100 100 300 375
Attenuation Tank 2	517799.628	131780.134	56.071	1.154			0 1.005 1 1.004	54.917 54.917	525 525
5	517788.912	131765.600	56.064	1.240	1500		0 1.006 1 15.000 2 1.005	54.824 55.250 54.824	525 100 525
4	517799.300	131758.038	56.151	1.353	1500		0 1.007 1 6.001 2 1.006	54.798 55.099 54.798	525 225 525
Attenuation Tank 1	517822.402	131740.996	56.220	1.481			0 1.008 1 19.000 2 18.000 3 1.007	54.739 55.500 55.500 54.739	525 100 100 525



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
2	517845.504	131723.875	56.129	1.473	2100		1	1.008	54.656	525
							0	1.009	54.656	525
1	517849.632	131719.735	56.060	1.415			1	1.009	54.645	525
Permeable Paving 1	517816.862	131736.956	56.310	0.650						
							0	18.000	55.660	100
Permeable Paving 2	517822.519	131746.976	56.475	0.650						
							0	19.000	55.825	100
Permeable Paving 3	517786.461	131748.812	56.000	0.600						
							0	17.000	55.400	100
Permeable Paving 4	517784.303	131759.549	55.900	0.600						
							0	15.000	55.300	100
Permeable Paving 5	517871.877	131812.155	56.890	0.600						
							0	11.000	56.290	100
Permeable Paving 6	517880.126	131824.279	57.270	0.600						
							0	10.000	56.670	100
Permeable Paving 7	517863.725	131841.738	57.145	0.600						
							0	12.000	56.545	100
Permeable Paving 8	517804.187	131850.117	57.000	0.600						
							0	8.000	56.400	100
Permeable Paving 9	517705.286	131863.402	57.675	0.600						
							0	3.000	57.075	100
Permeable Paving 10	517698.372	131853.271	57.250	0.600						
							0	2.000	56.650	100
Permeable Paving 11	517748.561	131820.935	56.600	0.600						
							0	6.000	56.000	100



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Permeable Paving 12	517741.862	131807.864	56.585	0.600					
						0	5.000	55.985	100
Permeable Paving 13	517738.072	131799.324	56.780	0.600					
						0	4.000	56.180	100
Rain Garden 2	517815.154	131811.493	56.460	0.400					
						0	13.000	56.060	100
Rain Garden 1	517808.257	131801.385	56.420	0.400					
						0	14.000	56.020	100

Simulation Settings

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

Storm Durations

15 | 30 | 60 | 120 | 240 | 720 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	45	0	0
100	45	10	0

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	54.656	Product Number	CTL-SHE-0277-4450-1269-4450
Design Depth (m)	1.269	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	44.5	Min Node Diameter (mm)	2100

Node Permeable Paving 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	55.660	Diameter (m)	0.027		

Node Permeable Paving 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	55.825	Diameter (m)	0.027		



Node Permeable Paving 3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	55.400	Diameter (m)	0.027		

Node Permeable Paving 4 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	55.300	Diameter (m)	0.027		

Node Permeable Paving 5 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.290	Diameter (m)	0.027		

Node Permeable Paving 6 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.670	Diameter (m)	0.027		

Node Permeable Paving 7 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.545	Diameter (m)	0.027		

Node Permeable Paving 8 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.400	Diameter (m)	0.027		

Node Permeable Paving 9 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	57.075	Diameter (m)	0.027		

Node Permeable Paving 10 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.650	Diameter (m)	0.027		

Node Permeable Paving 11 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.000	Diameter (m)	0.027		



Node Permeable Paving 12 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	55.985	Diameter (m)	0.027		

Node Permeable Paving 13 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	56.180	Diameter (m)	0.027		

Node Attenuation Tank 6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	54.975	Product Number	CTL-SHE-0258-3750-1260-3750
Design Depth (m)	1.260	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	37.5	Min Node Diameter (mm)	2100

Node Attenuation Tank 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	56.076	Product Number	CTL-SHE-0092-4000-1170-4000
Design Depth (m)	1.170	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.0	Min Node Diameter (mm)	1200

Node Permeable Paving 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.660	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	40	Depth (m)	0.600
Safety Factor	2.0	Width (m)	4.275	Inf Depth (m)	
Porosity	0.30	Length (m)	19.600		

Node Permeable Paving 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.825	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	166	Depth (m)	0.600
Safety Factor	2.0	Width (m)	17.000	Inf Depth (m)	
Porosity	0.30	Length (m)	12.750		

Node Permeable Paving 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.400	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	2.0	Width (m)	15.200	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node Permeable Paving 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.300	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	2.0	Width (m)	14.600	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		



Node Permeable Paving 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.290	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	152	Depth (m)	0.600
Safety Factor	2.0	Width (m)	17.000	Inf Depth (m)	
Porosity	0.30	Length (m)	11.125		

Node Permeable Paving 6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.670	Slope (1:X)	55.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	58	Depth (m)	0.600
Safety Factor	2.0	Width (m)	4.275	Inf Depth (m)	
Porosity	0.30	Length (m)	19.500		

Node Permeable Paving 7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.545	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	99	Depth (m)	0.600
Safety Factor	2.0	Width (m)	13.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Permeable Paving 8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.400	Slope (1:X)	35.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.800		

Node Permeable Paving 9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	57.075	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	101	Depth (m)	0.600
Safety Factor	2.0	Width (m)	14.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Permeable Paving 10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.650	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	2.0	Width (m)	15.600	Inf Depth (m)	
Porosity	0.30	Length (m)	12.000		

Node Permeable Paving 11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.000	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	222	Depth (m)	0.600
Safety Factor	2.0	Width (m)	15.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node Permeable Paving 12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.985	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	160	Depth (m)	0.600
Safety Factor	2.0	Width (m)	17.500	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		



Node Permeable Paving 13 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.180	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	49	Depth (m)	0.600
Safety Factor	2.0	Width (m)	9.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Rain Garden 2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.060	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	21	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	120.000	Number Required	1
Porosity	0.30	Pit Length (m)	1.250		

Node Rain Garden 1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.020	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	60	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	200.000	Number Required	1
Porosity	0.30	Pit Length (m)	1.250		

Node Attenuation Tank 2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.917	Depth (m)	0.840
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	156	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.800	Number Required	1
Porosity	0.95	Pit Length (m)	36.000		

Node Attenuation Tank 3 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.638	Depth (m)	1.050
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	47	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	41.000		

Node Attenuation Tank 4 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.233	Depth (m)	1.050
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	170	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	40.000		

Node Attenuation Tank 1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.739	Depth (m)	1.050
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	204	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	28.000		

Node Attenuation Tank 5 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.076	Depth (m)	1.260
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	24.800		



Node Attenuation Tank 6 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.975	Depth (m)	1.050
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	176	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	6.000	Number Required	1
Porosity	0.95	Pit Length (m)	10.000		



Results for 1 year Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	23	10	55.423	0.071	7.9	0.0806	0.0000	OK
15 minute summer	22	10	55.232	0.072	8.1	0.0816	0.0000	OK
15 minute summer	21	10	56.122	0.057	7.4	0.0642	0.0000	OK
120 minute summer	Attenuation Tank 3	72	55.712	0.074	16.8	14.4193	0.0000	OK
120 minute summer	19	70	55.549	0.087	13.3	0.0981	0.0000	OK
120 minute summer	18	68	55.449	0.087	15.6	0.0988	0.0000	OK
15 minute summer	17	10	56.304	0.037	2.9	0.0416	0.0000	OK
15 minute summer	16	11	55.652	0.053	4.9	0.0602	0.0000	OK
15 minute summer	15	10	55.878	0.053	4.6	0.0603	0.0000	OK
15 minute summer	14	11	55.686	0.068	7.6	0.0772	0.0000	OK
15 minute summer	13	10	56.549	0.030	1.6	0.0335	0.0000	OK
15 minute summer	12	11	56.443	0.049	5.1	0.0560	0.0000	OK
15 minute summer	11	10	56.507	0.051	5.3	0.0572	0.0000	OK
240 minute summer	Attenuation Tank 5	152	56.238	0.162	7.8	15.2332	0.0000	OK
15 minute summer	9	11	55.513	0.098	16.1	0.1106	0.0000	OK
120 minute summer	Attenuation Tank 4	74	55.312	0.079	15.3	12.0292	0.0000	OK
120 minute summer	Attenuation Tank 6	78	55.290	0.315	30.8	17.9641	0.0000	OK
240 minute summer	Attenuation Tank 2	144	55.013	0.096	27.2	15.7752	0.0000	OK
240 minute summer	5	156	55.002	0.178	27.8	0.3151	0.0000	OK
240 minute summer	4	156	54.997	0.199	30.5	0.3509	0.0000	OK
240 minute summer	Attenuation Tank 1	156	54.993	0.254	32.8	26.9838	0.0000	OK
240 minute summer	2	156	54.991	0.335	30.4	1.1612	0.0000	OK
240 minute summer	1	156	54.759	0.114	30.4	0.0000	0.0000	OK
120 minute summer	Permeable Paving 1	74	55.709	0.049	0.5	0.3079	0.0000	OK
120 minute summer	Permeable Paving 2	78	55.944	0.119	1.4	1.0932	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	23	16.000	22	7.8	0.989	0.409	0.0802	
15 minute summer	22	6.001	4	8.1	0.768	0.202	0.1075	
15 minute summer	21	9.000	Attenuation Tank 3	7.2	0.925	0.138	0.2728	
120 minute summer	Attenuation Tank 3	9.001	19	10.7	0.713	0.136	0.5325	
120 minute summer	19	9.002	18	13.4	0.793	0.171	0.3384	
120 minute summer	18	9.003	Attenuation Tank 6	15.5	0.925	0.182	0.4558	
15 minute summer	17	7.000	16	2.9	1.108	0.278	0.0558	
15 minute summer	16	7.001	Attenuation Tank 4	4.9	0.686	0.121	0.1530	
15 minute summer	15	4.001	14	4.5	0.823	0.252	0.0719	
15 minute summer	14	4.002	9	7.6	0.767	0.191	0.2152	
15 minute summer	13	2.001	12	1.5	0.408	0.085	0.0470	
15 minute summer	12	2.002	Attenuation Tank 5	5.0	1.005	0.229	0.0797	
15 minute summer	11	1.000	Attenuation Tank 5	5.3	1.047	0.102	0.2714	
240 minute summer	Attenuation Tank 5	1.001	9	3.4	0.727	0.067	0.2813	
15 minute summer	9	1.002	Attenuation Tank 4	16.2	0.824	0.227	0.5022	
120 minute summer	Attenuation Tank 4	1.003	Attenuation Tank 6	11.3	0.592	0.101	1.0689	
120 minute summer	Attenuation Tank 6	1.004	Attenuation Tank 2	26.4	0.950	0.122	0.8632	
240 minute summer	Attenuation Tank 2	1.005	5	26.4	0.654	0.076	0.8199	
240 minute summer	5	1.006	4	27.5	0.517	0.126	0.8950	
240 minute summer	4	1.007	Attenuation Tank 1	30.0	0.533	0.138	2.5548	
240 minute summer	Attenuation Tank 1	1.008	2	29.7	0.238	0.115	3.5768	
240 minute summer	2	1.009	1	30.4	0.819	0.146	0.2171	222.9
120 minute summer	Permeable Paving 1	18.000	Attenuation Tank 1	0.3	0.532	0.031	0.0037	
120 minute summer	Permeable Paving 2	19.000	Attenuation Tank 1	0.5	0.845	0.035	0.0035	



Results for 1 year Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Permeable Paving 3	78	55.510	0.110	1.4	1.1210	0.0000	SURCHARGED
120 minute summer	Permeable Paving 4	78	55.399	0.099	1.1	0.8675	0.0000	OK
120 minute summer	Permeable Paving 5	78	56.385	0.095	1.2	0.9303	0.0000	OK
15 minute summer	Permeable Paving 6	14	56.748	0.078	1.0	0.2188	0.0000	OK
120 minute summer	Permeable Paving 7	74	56.638	0.093	0.9	0.5098	0.0000	OK
240 minute summer	Permeable Paving 8	152	56.562	0.162	1.8	2.7799	0.0000	SURCHARGED
120 minute summer	Permeable Paving 9	74	57.165	0.090	0.9	0.5210	0.0000	OK
120 minute summer	Permeable Paving 10	76	56.760	0.110	1.2	0.8540	0.0000	SURCHARGED
120 minute summer	Permeable Paving 11	78	56.114	0.114	1.4	1.1704	0.0000	SURCHARGED
120 minute summer	Permeable Paving 12	78	56.074	0.089	1.1	0.8315	0.0000	OK
30 minute summer	Permeable Paving 13	22	56.250	0.070	0.9	0.2731	0.0000	OK
120 minute summer	Rain Garden 2	68	56.088	0.028	2.0	1.2773	0.0000	OK
120 minute summer	Rain Garden 1	72	56.045	0.025	2.0	1.8955	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)
120 minute summer	Permeable Paving 3	17.000	22	0.5	0.545	0.059	0.0059	
120 minute summer	Permeable Paving 4	15.000	5	0.4	0.383	0.088	0.0085	
120 minute summer	Permeable Paving 5	11.000	Attenuation Tank 3	0.4	0.537	0.054	0.0064	
15 minute summer	Permeable Paving 6	10.000	Attenuation Tank 3	0.4	0.519	0.048	0.0062	
120 minute summer	Permeable Paving 7	12.000	19	0.4	0.533	0.054	0.0152	
240 minute summer	Permeable Paving 8	8.000	16	0.6	0.583	0.073	0.0098	
120 minute summer	Permeable Paving 9	3.000	12	0.4	0.723	0.034	0.0031	
120 minute summer	Permeable Paving 10	2.000	13	0.5	0.544	0.059	0.0041	
120 minute summer	Permeable Paving 11	6.000	14	0.5	0.514	0.066	0.0066	
120 minute summer	Permeable Paving 12	5.000	15	0.4	0.480	0.059	0.0055	
30 minute summer	Permeable Paving 13	4.000	15	0.4	0.453	0.053	0.0115	
120 minute summer	Rain Garden 2	13.000	Attenuation Tank 6	1.5	0.848	0.175	0.0156	
120 minute summer	Rain Garden 1	14.000	Attenuation Tank 6	1.1	0.708	0.139	0.0130	



Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	23	11	56.176	0.824	44.9	0.9315	0.0000	FLOOD RISK
240 minute winter	22	232	55.504	0.344	8.8	0.3886	0.0000	SURCHARGED
15 minute summer	21	10	56.220	0.155	42.1	0.1753	0.0000	OK
120 minute summer	Attenuation Tank 3	96	55.969	0.331	77.0	64.3703	0.0000	SURCHARGED
120 minute summer	19	94	55.964	0.502	65.8	0.5676	0.0000	SURCHARGED
120 minute summer	18	94	55.959	0.597	72.2	0.6752	0.0000	SURCHARGED
15 minute summer	17	12	56.990	0.723	16.6	0.8179	0.0000	SURCHARGED
120 minute summer	16	94	55.954	0.355	12.3	0.4018	0.0000	SURCHARGED
15 minute summer	15	11	56.084	0.259	23.3	0.2926	0.0000	SURCHARGED
120 minute summer	14	96	55.959	0.341	19.1	0.3852	0.0000	SURCHARGED
240 minute summer	13	240	56.923	0.404	2.5	0.4575	0.0000	SURCHARGED
240 minute summer	12	240	56.923	0.529	7.8	0.5987	0.0000	SURCHARGED
240 minute summer	11	240	56.922	0.466	8.2	0.5271	0.0000	SURCHARGED
240 minute summer	Attenuation Tank 5	240	56.922	0.846	27.7	79.7231	0.0000	SURCHARGED
120 minute summer	9	94	55.956	0.541	45.1	0.6124	0.0000	SURCHARGED
120 minute summer	Attenuation Tank 4	94	55.954	0.721	83.1	109.5412	0.0000	SURCHARGED
120 minute summer	Attenuation Tank 6	94	55.952	0.977	94.4	55.6797	0.0000	SURCHARGED
240 minute winter	Attenuation Tank 2	232	55.506	0.589	41.4	96.7394	0.0000	SURCHARGED
240 minute winter	5	232	55.505	0.681	37.6	1.2033	0.0000	SURCHARGED
240 minute winter	4	232	55.503	0.705	41.2	1.2466	0.0000	SURCHARGED
240 minute winter	Attenuation Tank 1	232	55.501	0.762	51.5	81.0964	0.0000	SURCHARGED
240 minute winter	2	232	55.499	0.843	44.8	2.9185	0.0000	SURCHARGED
120 minute winter	1	72	54.783	0.138	44.4	0.0000	0.0000	OK
60 minute winter	Permeable Paving 1	51	55.818	0.158	2.8	2.7540	0.0000	SURCHARGED
120 minute winter	Permeable Paving 2	98	56.159	0.334	4.5	8.5500	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	23	16.000	22	43.3	2.458	2.269	0.1787	
240 minute winter	22	6.001	4	8.8	0.775	0.220	0.4068	
15 minute summer	21	9.000	Attenuation Tank 3	41.4	1.450	0.796	1.0065	
120 minute summer	Attenuation Tank 3	9.001	19	49.3	0.949	0.630	2.4758	
120 minute summer	19	9.002	18	58.7	1.036	0.750	1.4097	
120 minute summer	18	9.003	Attenuation Tank 6	69.6	1.008	0.815	1.9103	
15 minute summer	17	7.000	16	13.9	1.775	1.352	0.1683	
120 minute summer	16	7.001	Attenuation Tank 4	12.3	0.855	0.307	0.8567	
15 minute summer	15	4.001	14	22.0	1.251	1.238	0.2318	
120 minute summer	14	4.002	9	19.5	0.958	0.488	0.8615	
240 minute summer	13	2.001	12	2.4	0.463	0.132	0.2203	
240 minute summer	12	2.002	Attenuation Tank 5	7.3	0.726	0.333	0.2800	
240 minute summer	11	1.000	Attenuation Tank 5	7.6	0.761	0.146	1.5079	
240 minute summer	Attenuation Tank 5	1.001	9	4.0	0.765	0.079	1.3651	
120 minute summer	9	1.002	Attenuation Tank 4	41.3	0.974	0.579	1.8005	
120 minute summer	Attenuation Tank 4	1.003	Attenuation Tank 6	-28.1	0.594	-0.250	3.7358	
120 minute summer	Attenuation Tank 6	1.004	Attenuation Tank 2	37.5	0.971	0.173	5.9845	
240 minute winter	Attenuation Tank 2	1.005	5	37.1	0.638	0.107	3.9009	
240 minute winter	5	1.006	4	37.6	0.523	0.173	2.7758	
240 minute winter	4	1.007	Attenuation Tank 1	40.2	0.607	0.185	6.2019	
240 minute winter	Attenuation Tank 1	1.008	2	44.2	0.246	0.171	6.2120	
240 minute winter	2	1.009	1	44.4	0.911	0.213	0.2854	879.5
60 minute winter	Permeable Paving 1	18.000	Attenuation Tank 1	0.6	0.656	0.062	0.0060	
120 minute winter	Permeable Paving 2	19.000	Attenuation Tank 1	0.9	0.995	0.060	0.0052	



Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Permeable Paving 3	100	55.706	0.306	4.4	8.5489	0.0000	FLOOD RISK
120 minute winter	Permeable Paving 4	114	55.585	0.285	3.7	7.0022	0.0000	SURCHARGED
120 minute summer	Permeable Paving 5	96	56.560	0.270	5.7	7.4345	0.0000	SURCHARGED
60 minute summer	Permeable Paving 6	45	56.929	0.259	3.9	2.3751	0.0000	SURCHARGED
60 minute summer	Permeable Paving 7	53	56.826	0.281	6.3	4.6335	0.0000	SURCHARGED
120 minute winter	Permeable Paving 8	118	56.818	0.418	8.1	18.3709	0.0000	FLOOD RISK
60 minute winter	Permeable Paving 9	58	57.353	0.277	4.7	4.8675	0.0000	SURCHARGED
120 minute summer	Permeable Paving 10	120	56.977	0.327	5.6	7.5393	0.0000	FLOOD RISK
120 minute summer	Permeable Paving 11	100	56.317	0.317	6.7	9.0819	0.0000	FLOOD RISK
120 minute winter	Permeable Paving 12	98	56.237	0.252	3.6	6.6884	0.0000	SURCHARGED
60 minute summer	Permeable Paving 13	47	56.406	0.226	4.2	2.7629	0.0000	SURCHARGED
30 minute summer	Rain Garden 2	21	56.182	0.122	19.5	5.4884	0.0000	FLOOD RISK
30 minute summer	Rain Garden 1	22	56.110	0.090	19.3	6.7620	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)
120 minute winter	Permeable Paving 3	17.000	22	0.8	0.630	0.104	0.0379	
120 minute winter	Permeable Paving 4	15.000	5	0.7	0.443	0.152	0.0595	
120 minute summer	Permeable Paving 5	11.000	Attenuation Tank 3	0.8	0.636	0.096	0.0095	
60 minute summer	Permeable Paving 6	10.000	Attenuation Tank 3	0.7	0.633	0.094	0.0099	
60 minute summer	Permeable Paving 7	12.000	19	0.8	0.637	0.099	0.0234	
120 minute winter	Permeable Paving 8	8.000	16	1.0	0.675	0.121	0.0140	
60 minute winter	Permeable Paving 9	3.000	12	0.8	0.865	0.063	0.0048	
120 minute summer	Permeable Paving 10	2.000	13	0.7	0.611	0.095	0.0376	
120 minute summer	Permeable Paving 11	6.000	14	0.8	0.603	0.115	0.0219	
120 minute winter	Permeable Paving 12	5.000	15	0.7	0.566	0.106	0.0181	
60 minute summer	Permeable Paving 13	4.000	15	0.7	0.550	0.103	0.0184	
30 minute summer	Rain Garden 2	13.000	Attenuation Tank 6	9.5	1.281	1.073	0.0658	
30 minute summer	Rain Garden 1	14.000	Attenuation Tank 6	8.4	1.143	1.066	0.0622	



Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	23	9	56.402	1.050	62.2	1.1876	2.2905	FLOOD
240 minute summer	22	196	55.927	0.767	17.5	0.8672	0.0000	SURCHARGED
30 minute summer	21	19	56.355	0.290	53.9	0.3283	0.0000	SURCHARGED
60 minute winter	Attenuation Tank 3	60	56.252	0.614	122.2	119.6036	0.0000	SURCHARGED
120 minute winter	19	114	56.245	0.783	57.2	0.8860	0.0000	SURCHARGED
120 minute winter	18	114	56.239	0.877	64.1	0.9924	0.0000	FLOOD RISK
15 minute summer	17	11	57.567	1.300	23.1	1.4703	0.4004	FLOOD
120 minute winter	16	114	56.233	0.634	11.8	0.7173	0.0000	SURCHARGED
15 minute summer	15	11	56.430	0.605	31.7	0.6839	0.0000	FLOOD RISK
120 minute winter	14	114	56.238	0.620	18.5	0.7007	0.0000	SURCHARGED
240 minute winter	13	228	57.244	0.725	2.3	0.8204	0.0000	FLOOD RISK
240 minute winter	12	228	57.244	0.850	7.1	0.9618	0.0000	SURCHARGED
240 minute winter	11	228	57.244	0.788	7.5	0.8912	0.0000	SURCHARGED
240 minute winter	Attenuation Tank 5	232	57.244	1.168	26.7	110.0607	0.0000	SURCHARGED
120 minute winter	9	114	56.236	0.821	42.3	0.9282	0.0000	SURCHARGED
120 minute winter	Attenuation Tank 4	114	56.233	1.000	72.9	151.9403	0.0000	FLOOD RISK
120 minute winter	Attenuation Tank 6	114	56.231	1.256	86.3	59.8785	0.0000	FLOOD RISK
240 minute summer	Attenuation Tank 2	196	55.929	1.012	46.3	137.9765	0.0000	FLOOD RISK
240 minute summer	5	196	55.928	1.104	40.5	1.9506	0.0000	FLOOD RISK
240 minute summer	4	196	55.927	1.129	43.2	1.9943	0.0000	FLOOD RISK
240 minute summer	Attenuation Tank 1	196	55.925	1.186	60.4	111.7732	0.0000	FLOOD RISK
240 minute summer	2	196	55.922	1.266	45.3	4.3860	0.0000	FLOOD RISK
30 minute summer	1	21	54.783	0.138	44.4	0.0000	0.0000	OK
240 minute summer	Permeable Paving 1	240	55.894	0.234	2.1	4.6497	0.0000	SURCHARGED
120 minute winter	Permeable Paving 2	114	56.234	0.409	6.2	12.8143	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)
15 minute summer	23	16.000	22	48.0	2.724	2.514	0.1787	
240 minute summer	22	6.001	4	16.8	0.852	0.419	0.4068	
30 minute summer	21	9.000	Attenuation Tank 3	53.0	1.452	1.020	1.3983	
60 minute winter	Attenuation Tank 3	9.001	19	55.5	0.948	0.709	2.4758	
120 minute winter	19	9.002	18	52.7	1.039	0.673	1.4097	
120 minute winter	18	9.003	Attenuation Tank 6	64.0	1.006	0.750	1.9103	
15 minute summer	17	7.000	16	16.8	2.146	1.634	0.1689	
120 minute winter	16	7.001	Attenuation Tank 4	11.1	0.812	0.278	0.8567	
15 minute summer	15	4.001	14	26.5	1.506	1.492	0.2320	
120 minute winter	14	4.002	9	17.8	0.917	0.446	0.8615	
240 minute winter	13	2.001	12	2.1	0.447	0.117	0.2203	
240 minute winter	12	2.002	Attenuation Tank 5	6.9	0.755	0.312	0.2800	
240 minute winter	11	1.000	Attenuation Tank 5	7.2	0.716	0.139	1.5079	
240 minute winter	Attenuation Tank 5	1.001	9	4.2	0.765	0.084	1.6311	
120 minute winter	9	1.002	Attenuation Tank 4	40.0	0.955	0.560	1.8005	
120 minute winter	Attenuation Tank 4	1.003	Attenuation Tank 6	-25.5	0.592	-0.227	3.7358	
120 minute winter	Attenuation Tank 6	1.004	Attenuation Tank 2	37.5	1.009	0.172	6.1422	
240 minute summer	Attenuation Tank 2	1.005	5	38.9	0.649	0.112	3.9009	
240 minute summer	5	1.006	4	39.5	0.533	0.182	2.7758	
240 minute summer	4	1.007	Attenuation Tank 1	43.5	0.714	0.200	6.2019	
240 minute summer	Attenuation Tank 1	1.008	2	44.2	0.232	0.171	6.2120	
240 minute summer	2	1.009	1	44.4	0.911	0.213	0.2854	1043.3
240 minute summer	Permeable Paving 1	18.000	Attenuation Tank 1	0.6	0.663	0.068	0.0537	
120 minute winter	Permeable Paving 2	19.000	Attenuation Tank 1	1.0	1.015	0.067	0.0262	



Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Permeable Paving 3	248	55.837	0.437	5.4	17.1055	0.0000	FLOOD RISK
240 minute summer	Permeable Paving 4	252	55.796	0.496	4.5	16.2417	0.0000	FLOOD RISK
120 minute winter	Permeable Paving 5	114	56.627	0.337	5.4	11.2178	0.0000	FLOOD RISK
60 minute summer	Permeable Paving 6	48	56.993	0.323	5.5	3.6973	0.0000	FLOOD RISK
60 minute winter	Permeable Paving 7	59	56.894	0.349	6.4	7.1148	0.0000	FLOOD RISK
240 minute winter	Permeable Paving 8	224	56.907	0.507	6.6	26.9899	0.0000	FLOOD RISK
60 minute winter	Permeable Paving 9	59	57.418	0.343	6.6	7.4086	0.0000	FLOOD RISK
240 minute summer	Permeable Paving 10	272	57.166	0.516	4.7	17.7899	0.0000	FLOOD RISK
120 minute winter	Permeable Paving 11	120	56.399	0.399	6.4	14.2901	0.0000	FLOOD RISK
120 minute summer	Permeable Paving 12	122	56.322	0.337	7.2	11.1184	0.0000	FLOOD RISK
60 minute winter	Permeable Paving 13	57	56.464	0.284	4.3	4.2938	0.0000	SURCHARGED
30 minute summer	Rain Garden 2	22	56.248	0.188	27.4	8.4446	0.0000	FLOOD RISK
120 minute winter	Rain Garden 1	118	56.234	0.214	8.9	16.0205	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)
240 minute summer	Permeable Paving 3	17.000	22	-1.1	0.647	-0.134	0.0538	
240 minute summer	Permeable Paving 4	15.000	5	-1.3	0.466	-0.268	0.0595	
120 minute winter	Permeable Paving 5	11.000	Attenuation Tank 3	0.9	0.653	0.108	0.0360	
60 minute summer	Permeable Paving 6	10.000	Attenuation Tank 3	0.8	0.655	0.106	0.0108	
60 minute winter	Permeable Paving 7	12.000	19	0.9	0.659	0.111	0.0267	
240 minute winter	Permeable Paving 8	8.000	16	1.1	0.695	0.134	0.0151	
60 minute winter	Permeable Paving 9	3.000	12	0.9	0.864	0.076	0.0271	
240 minute summer	Permeable Paving 10	2.000	13	0.7	0.607	0.094	0.0376	
120 minute winter	Permeable Paving 11	6.000	14	1.0	0.608	0.136	0.0559	
120 minute summer	Permeable Paving 12	5.000	15	0.9	0.573	0.129	0.0510	
60 minute winter	Permeable Paving 13	4.000	15	0.8	0.539	0.127	0.0963	
30 minute summer	Rain Garden 2	13.000	Attenuation Tank 6	10.7	1.363	1.207	0.0668	
120 minute winter	Rain Garden 1	14.000	Attenuation Tank 6	7.6	1.142	0.960	0.0655	