Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.365	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.054	4.00	72.624	1200	440023.833	402329.084	1.425
2	0.041	4.00	71.673	1200	440052.894	402349.067	1.425
3	0.071	4.00	71.276	1200	440066.213	402352.285	1.926
4	0.030	4.00	70.948	1200	440078.098	402350.414	1.994
5	0.071	4.00	70.561	1200	440101.260	402339.062	1.933
6	0.096	4.00	70.674	1200	440105.201	402313.428	1.425
7	0.018	4.00	70.300	1500	440115.690	402320.699	2.200
8	0.016	4.00	69.777	1500	440131.586	402320.432	2.017
9	0.207	4.00	68.852	1800	440158.942	402307.790	2.171
10	0.062	4.00	68.357	1500	440177.040	402283.934	2.226
11	0.071	4.00	68.513	1500	440178.691	402272.296	2.604
12	0.087	4.00	72.068	1200	440049.649	402301.308	1.425
13	0.060	4.00	71.520	1500	440056.696	402271.216	1.425
14			71.747	1500	440063.637	402285.583	1.951
15	0.026	4.00	71.761	1500	440073.114	402291.533	2.031
16	0.129	4.00	71.352	1500	440094.302	402275.840	1.778
17	0.070	4.00	70.338	1500	440137.740	402256.962	1.915
18	0.121	4.00	69.030	1800	440163.780	402242.450	3.502
19	0.076	4.00	67.977	1500	440213.011	402217.559	2.782
20	0.113	4.00	67.712	1800	440225.163	402222.225	2.604
21	0.085	4.00	67.390	1500	440232.345	402236.234	2.387
22	0.107	4.00	66.826	1500	440253.186	402258.707	2.027
23	0.111	4.00	64.068	1500	440286.596	402294.734	1.725
24	0.061	4.00	62.218	1500	440312.777	402322.965	1.725
25	0.020	4.00	61.516	1200	440307.341	402354.755	1.350
26	0.015	4.00	61.650	1500	440323.200	402334.204	2.194
27	0.000	4.00	61.500	1500	440332.046	402340.522	3.089
28	0.081	4.00	60.576	1500	440306.897	402419.937	1.500
29	0.069	4.00	60.820	1500	440318.976	402403.257	1.868
30	0.127	4.00	61.236	1500	440303.360	402377.547	1.500
31	0.026	4.00	60.997	1500	440318.431	402388.461	2.134
32			61.000	1200	440329.217	402373.360	2.274
27.1			61.500	1200	440345.704	402350.277	3.131
33			60.500	1800	440352.466	402340.810	2.459
34	0.036	4.00	60.500	1800	440355.478	402336.592	2.471
35	0.039	4.00	60.988	1800	440360.438	402313.705	3.008
36			60.552	2100	440383.633	402290.313	2.695
37			60.155	1200	440394.314	402289.243	2.405

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

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	1	2	35.268	0.600	71.199	70.248	0.951	37.1	150	4.35	75.0
1.001	2	3	13.702	0.600	70.248	69.425	0.823	16.6	150	4.45	75.0
1.002	3	4	12.031	0.600	69.350	69.029	0.321	37.5	225	4.54	75.0
1.003	4	5	25.794	0.600	68.954	68.628	0.326	79.1	300	4.78	75.0
1.004	5	7	23.354	0.600	68.628	68.100	0.528	44.2	300	4.95	75.0
2.000	6	7	12.763	0.600	69.249	68.250	0.999	12.8	150	4.08	75.0
1.005	7	8	15.898	0.600	68.100	67.835	0.265	60.0	300	5.08	75.0
1.006	8	9	30.136	0.600	67.760	66.756	1.004	30.0	375	5.23	75.0
1.007	9	10	29.944	0.600	66.681	66.206	0.475	63.0	450	5.41	75.0
1.008	10	11	11.755	0.600	66.131	65.984	0.147	80.0	525	5.49	75.0
1.009	11	18	33.363	0.600	65.909	65.528	0.381	87.6	525	5.72	75.0
3.000	12	14	21.046	0.600	70.643	69.871	0.772	27.3	225	4.18	75.0
4.000	13	14	15.956	0.600	70.095	69.871	0.224	71.2	225	4.22	75.0
3.001	14	15	11.190	0.600	69.796	69.730	0.066	169.5	225	4.41	75.0
3.002	15	16	26.367	0.600	69.730	69.574	0.156	169.0	225	4.85	75.0
3.003	16	17	47.363	0.600	69.574	68.423	1.151	41.1	300	5.17	75.0
3.004	17	18	29.811	0.600	68.423	65.753	2.670	11.2	300	5.27	75.0
1.010	18	19	55.166	0.600	65.528	65.195	0.333	165.7	525	6.25	75.0
1.011	19	20	13.017	0.600	65.195	65.108	0.087	149.6	525	6.37	75.0
1.012	20	21	15.743	0.600	65.108	65.003	0.105	149.9	525	6.51	75.0
1.013	21	22	30.649	0.600	65.003	64.799	0.204	150.2	525	6.79	75.0
1.014	22	23	49.134	0.600	64.799	62.343	2.456	20.0	525	6.95	75.0
1.015	23	24	38.502	0.600	62.343	60.493	1.850	20.8	525	7.09	75.0
1.016	24	26	15.328	0.600	60.493	59.531	0.962	15.9	525	7.13	75.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.658	29.3	11.0	1.275	1.275	0.054	0.0
1.001	2.480	43.8	19.3	1.275	1.701	0.095	0.0
1.002	2.143	85.2	33.7	1.701	1.694	0.166	0.0
1.003	1.769	125.0	39.8	1.694	1.633	0.196	0.0
1.004	2.370	167.5	54.3	1.633	1.900	0.267	0.0
2.000	2.833	50.1	19.5	1.275	1.900	0.096	0.0
1.005	2.033	143.7	77.5	1.900	1.642	0.381	0.0
1.006	3.317	366.4	80.7	1.642	1.721	0.397	0.0
1.007	2.564	407.7	122.8	1.721	1.701	0.604	0.0
1.008	2.506	542.5	135.4	1.701	2.004	0.666	0.0
1.009	2.394	518.3	149.8	2.079	2.977	0.737	0.0
3.000	2.515	100.0	17.7	1.200	1.651	0.087	0.0
4.000	1.551	61.7	12.2	1.200	1.651	0.060	0.0
3.001	1.001	39.8	29.9	1.726	1.806	0.147	0.0
3.002	1.003	39.9	35.2	1.806	1.553	0.173	0.0
3.003	2.458	173.7	61.4	1.478	1.615	0.302	0.0
3.004	4.730	334.4	75.6	1.615	2.977	0.372	0.0
1.010	1.737	376.1	250.0	2.977	2.257	1.230	0.0
1.011	1.829	395.8	265.5	2.257	2.079	1.306	0.0
1.012	1.827	395.4	288.5	2.079	1.862	1.419	0.0
1.013	1.825	395.0	305.7	1.862	1.502	1.504	0.0
1.014	5.023	1087.4	327.5	1.502	1.200	1.611	0.0
1.015	4.925	1066.1	350.1	1.200	1.200	1.722	0.0
1.016	5.630	1218.8	362.5	1.200	1.594	1.783	0.0

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

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)
5.000	25	26	25.959	0.600	60.166	59.906	0.260	99.8	150	4.43	75.0
1.017	26	27	10.871	0.600	59.456	58.411	1.045	10.4	600	7.19	75.0
1.018	27	27.1	16.784	0.600	58.411	58.369	0.042	399.6	600	7.42	53.4
6.000	28	29	20.594	0.600	59.076	58.952	0.124	166.1	300	4.22	75.0
6.001	29	31	14.806	0.600	58.952	58.863	0.089	166.4	300	4.44	75.0
7.000	30	31	18.608	0.600	59.736	58.863	0.873	21.3	300	4.09	75.0
6.002	31	32	18.557	0.600	58.863	58.726	0.137	135.5	300	4.70	75.0
6.003	32	27.1	28.366	0.600	58.726	58.669	0.057	497.6	300	5.28	75.0
1.019	27.1	33	11.634	0.600	58.369	58.341	0.028	415.5	600	7.35	75.0
1.020	33	34	5.183	0.600	58.041	58.029	0.012	431.9	900	7.38	75.0
1.021	34	35	23.419	0.600	58.029	57.980	0.049	477.9	900	7.61	75.0
1.022	35	36	32.419	0.600	57.980	57.907	0.073	444.1	900	7.92	75.0
1.023	36	37	10.734	0.600	57.857	57.750	0.107	100.3	150	8.10	75.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
5.000	1.005	17.8	4.1	1.200	1.594	0.020	0.0
1.017	7.577	2142.3	369.6	1.594	2.489	1.818	0.0
1.018	1.212	342.6	263.2	2.489	2.531	1.818	0.0
6.000	1.217	86.0	16.5	1.200	1.568	0.081	0.0
6.001	1.216	85.9	30.5	1.568	1.834	0.150	0.0
7.000	3.420	241.7	25.8	1.200	1.834	0.127	0.0
6.002	1.349	95.3	61.6	1.834	1.974	0.303	0.0
6.003	0.698	49.3	61.6	1.974	2.531	0.303	0.0
1.019	1.188	335.9	431.2	2.531	1.559	2.121	0.0
1.020	1.501	954.8	431.2	1.559	1.571	2.121	0.0
1.021	1.426	907.3	438.5	1.571	2.108	2.157	0.0
1.022	1.480	941.5	446.4	2.108	1.745	2.196	0.0
1.023	1.003	17.7	446.4	2.545	2.255	2.196	0.0

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	35.268	37.1	150	1 Circular	72.624	71.199	1.275	71.673	70.248	1.275
1.001	13.702	16.6	150	1 Circular	71.673	70.248	1.275	71.276	69.425	1.701
1.002	12.031	37.5	225	1 Circular	71.276	69.350	1.701	70.948	69.029	1.694
1.003	25.794	79.1	300	1 Circular	70.948	68.954	1.694	70.561	68.628	1.633
1.004	23.354	44.2	300	1 Circular	70.561	68.628	1.633	70.300	68.100	1.900
2.000	12.763	12.8	150	1 Circular	70.674	69.249	1.275	70.300	68.250	1.900
1.005	15.898	60.0	300	1 Circular	70.300	68.100	1.900	69.777	67.835	1.642

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	1 Adoptable	2	1200	Manhole	1 Adoptable
1.001	2	1200	Manhole	1 Adoptable	3	1200	Manhole	1 Adoptable
1.002	3	1200	Manhole	1 Adoptable	4	1200	Manhole	1 Adoptable
1.003	4	1200	Manhole	1 Adoptable	5	1200	Manhole	1 Adoptable
1.004	5	1200	Manhole	1 Adoptable	7	1500	Manhole	1 Adoptable
2.000	6	1200	Manhole	1 Adoptable	7	1500	Manhole	1 Adoptable
1.005	7	1500	Manhole	1 Adoptable	8	1500	Manhole	1 Adoptable

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

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)
1.006	30.136	30.0	375	1 Circular	69.777	67.760	1.642	68.852	66.756	1.721
1.007	29.944	63.0	450	1 Circular	68.852	66.681	1.721	68.357	66.206	1.701
1.008	11.755	80.0	525	1 Circular	68.357	66.131	1.701	68.513	65.984	2.004
1.009	33.363	87.6	525	1 Circular	68.513	65.909	2.079	69.030	65.528	2.977
3.000	21.046	27.3	225	1 Circular	72.068	70.643	1.200	71.747	69.871	1.651
4.000	15.956	71.2	225	1 Circular	71.520	70.095	1.200	71.747	69.871	1.651
3.001	11.190	169.5	225	1 Circular	71.747	69.796	1.726	71.761	69.730	1.806
3.002	26.367	169.0	225	1 Circular	71.761	69.730	1.806	71.352	69.574	1.553
3.003	47.363	41.1	300	1 Circular	71.352	69.574	1.478	70.338	68.423	1.615
3.004	29.811	11.2	300	1 Circular	70.338	68.423	1.615	69.030	65.753	2.977
1.010	55.166	165.7	525	1 Circular	69.030	65.528	2.977	67.977	65.195	2.257
1.011	13.017	149.6	525	1 Circular	67.977	65.195	2.257	67.712	65.108	2.079
1.012	15.743	149.9	525	1 Circular	67.712	65.108	2.079	67.390	65.003	1.862
1.013	30.649	150.2	525	1 Circular	67.390	65.003	1.862	66.826	64.799	1.502
1.014	49.134	20.0	525	1 Circular	66.826	64.799	1.502	64.068	62.343	1.200
1.015	38.502	20.8	525	1 Circular	64.068	62.343	1.200	62.218	60.493	1.200
1.016	15.328	15.9	525	1 Circular	62.218	60.493	1.200	61.650	59.531	1.594
5.000	25.959	99.8	150	1 Circular	61.516	60.166	1.200	61.650	59.906	1.594
1.017	10.871	10.4	600	1 Circular	61.650	59.456	1.594	61.500	58.411	2.489
1.018	16.784	399.6	600	1 Circular	61.500	58.411	2.489	61.500	58.369	2.531
6.000	20.594	166.1	300	1 Circular	60.576	59.076	1.200	60.820	58.952	1.568
6.001	14.806	166.4	300	1 Circular	60.820	58.952	1.568	60.997	58.863	1.834
7.000	18.608	21.3	300	1 Circular	61.236	59.736	1.200	60.997	58.863	1.834
6.002	18.557	135.5	300	1 Circular	60.997	58.863	1.834	61.000	58.726	1.974
6.003	28.366	497.6	300	1 Circular	61.000	58.726	1.974	61.500	58.669	2.531

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	8	1500	Manhole	1 Adoptable	9	1800	Manhole	1 Adoptable
1.007	9	1800	Manhole	1 Adoptable	10	1500	Manhole	1 Adoptable
1.008	10	1500	Manhole	1 Adoptable	11	1500	Manhole	1 Adoptable
1.009	11	1500	Manhole	1 Adoptable	18	1800	Manhole	1 Adoptable
3.000	12	1200	Manhole	1 Adoptable	14	1500	Manhole	1 Adoptable
4.000	13	1500	Manhole	1 Adoptable	14	1500	Manhole	1 Adoptable
3.001	14	1500	Manhole	1 Adoptable	15	1500	Manhole	1 Adoptable
3.002	15	1500	Manhole	1 Adoptable	16	1500	Manhole	1 Adoptable
3.003	16	1500	Manhole	1 Adoptable	17	1500	Manhole	1 Adoptable
3.004	17	1500	Manhole	1 Adoptable	18	1800	Manhole	1 Adoptable
1.010	18	1800	Manhole	1 Adoptable	19	1500	Manhole	1 Adoptable
1.011	19	1500	Manhole	1 Adoptable	20	1800	Manhole	1 Adoptable
1.012	20	1800	Manhole	1 Adoptable	21	1500	Manhole	1 Adoptable
1.013	21	1500	Manhole	1 Adoptable	22	1500	Manhole	1 Adoptable
1.014	22	1500	Manhole	1 Adoptable	23	1500	Manhole	1 Adoptable
1.015	23	1500	Manhole	1 Adoptable	24	1500	Manhole	1 Adoptable
1.016	24	1500	Manhole	1 Adoptable	26	1500	Manhole	1 Adoptable
5.000	25	1200	Manhole	1 Adoptable	26	1500	Manhole	1 Adoptable
1.017	26	1500	Manhole	1 Adoptable	27	1500	Manhole	1 Adoptable
1.018	27	1500	Manhole	1 Adoptable	27.1	1200	Manhole	1 Adoptable
6.000	28	1500	Manhole	1 Adoptable	29	1500	Manhole	1 Adoptable
6.001	29	1500	Manhole	1 Adoptable	31	1500	Manhole	1 Adoptable
7.000	30	1500	Manhole	1 Adoptable	31	1500	Manhole	1 Adoptable
6.002	31	1500	Manhole	1 Adoptable	32	1200	Manhole	1 Adoptable
6.003	32	1200	Manhole	1 Adoptable	27.1	1200	Manhole	1 Adoptable

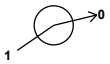
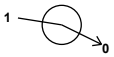
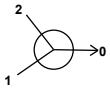
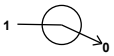
Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

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)
1.019	11.634	415.5	600	1 Circular	61.500	58.369	2.531	60.500	58.341	1.559
1.020	5.183	431.9	900	1 Circular	60.500	58.041	1.559	60.500	58.029	1.571
1.021	23.419	477.9	900	1 Circular	60.500	58.029	1.571	60.988	57.980	2.108
1.022	32.419	444.1	900	1 Circular	60.988	57.980	2.108	60.552	57.907	1.745
1.023	10.734	100.3	150	1 Circular	60.552	57.857	2.545	60.155	57.750	2.255

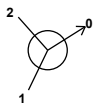
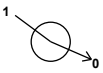
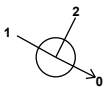
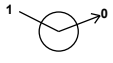
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.019	27.1	1200	Manhole	1 Adoptable	33	1800	Manhole	1 Adoptable
1.020	33	1800	Manhole	1 Adoptable	34	1800	Manhole	1 Adoptable
1.021	34	1800	Manhole	1 Adoptable	35	1800	Manhole	1 Adoptable
1.022	35	1800	Manhole	1 Adoptable	36	2100	Manhole	1 Adoptable
1.023	36	2100	Manhole	1 Adoptable	37	1200	Manhole	1 Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	440023.833	402329.084	72.624	1.425	1200				
						0	1.000	71.199	150
2	440052.894	402349.067	71.673	1.425	1200		1	1.000	70.248	150
									
						0	1.001	70.248	150
3	440066.213	402352.285	71.276	1.926	1200		1	1.001	69.425	150
									
						0	1.002	69.350	225
4	440078.098	402350.414	70.948	1.994	1200		1	1.002	69.029	225
									
						0	1.003	68.954	300
5	440101.260	402339.062	70.561	1.933	1200		1	1.003	68.628	300
									
						0	1.004	68.628	300
6	440105.201	402313.428	70.674	1.425	1200				
						0	2.000	69.249	150
7	440115.690	402320.699	70.300	2.200	1500		1	2.000	68.250	150
							2	1.004	68.100	300
									
						0	1.005	68.100	300
8	440131.586	402320.432	69.777	2.017	1500		1	1.005	67.835	300
									
						0	1.006	67.760	375

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
9	440158.942	402307.790	68.852	2.171	1800	1	1.006	66.756	375
									
						0	1.007	66.681	450
10	440177.040	402283.934	68.357	2.226	1500	1	1.007	66.206	450
									
						0	1.008	66.131	525
11	440178.691	402272.296	68.513	2.604	1500	1	1.008	65.984	525
									
						0	1.009	65.909	525
12	440049.649	402301.308	72.068	1.425	1200				
						0	3.000	70.643	225
13	440056.696	402271.216	71.520	1.425	1500				
						0	4.000	70.095	225
14	440063.637	402285.583	71.747	1.951	1500	1	4.000	69.871	225
						2	3.000	69.871	225
									
						0	3.001	69.796	225
15	440073.114	402291.533	71.761	2.031	1500	1	3.001	69.730	225
									
						0	3.002	69.730	225
16	440094.302	402275.840	71.352	1.778	1500	1	3.002	69.574	225
									
						0	3.003	69.574	300
17	440137.740	402256.962	70.338	1.915	1500	1	3.003	68.423	300
									
						0	3.004	68.423	300
18	440163.780	402242.450	69.030	3.502	1800	1	3.004	65.753	300
						2	1.009	65.528	525
									
						0	1.010	65.528	525
19	440213.011	402217.559	67.977	2.782	1500	1	1.010	65.195	525
									
						0	1.011	65.195	525
20	440225.163	402222.225	67.712	2.604	1800	1	1.011	65.108	525
									
						0	1.012	65.108	525
21	440232.345	402236.234	67.390	2.387	1500	1	1.012	65.003	525
									
						0	1.013	65.003	525

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
22	440253.186	402258.707	66.826	2.027	1500	1	1.013	64.799	525
						0	1.014	64.799	525
23	440286.596	402294.734	64.068	1.725	1500	1	1.014	62.343	525
						0	1.015	62.343	525
24	440312.777	402322.965	62.218	1.725	1500	1	1.015	60.493	525
						0	1.016	60.493	525
25	440307.341	402354.755	61.516	1.350	1200	0	5.000	60.166	150
26	440323.200	402334.204	61.650	2.194	1500	1	5.000	59.906	150
						2	1.016	59.531	525
						0	1.017	59.456	600
27	440332.046	402340.522	61.500	3.089	1500	1	1.017	58.411	600
						0	1.018	58.411	600
28	440306.897	402419.937	60.576	1.500	1500	0	6.000	59.076	300
29	440318.976	402403.257	60.820	1.868	1500	1	6.000	58.952	300
						0	6.001	58.952	300
30	440303.360	402377.547	61.236	1.500	1500	0	7.000	59.736	300
31	440318.431	402388.461	60.997	2.134	1500	1	7.000	58.863	300
						2	6.001	58.863	300
						0	6.002	58.863	300
32	440329.217	402373.360	61.000	2.274	1200	1	6.002	58.726	300
						0	6.003	58.726	300
27.1	440345.704	402350.277	61.500	3.131	1200	1	6.003	58.669	300
						2	1.018	58.369	600
						0	1.019	58.369	600
33	440352.466	402340.810	60.500	2.459	1800	1	1.019	58.341	600
						0	1.020	58.041	900

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
34	440355.478	402336.592	60.500	2.471	1800	1	1.020	58.029	900
						0	1.021	58.029	900
35	440360.438	402313.705	60.988	3.008	1800	1	1.021	57.980	900
						0	1.022	57.980	900
36	440383.633	402290.313	60.552	2.695	2100	1	1.022	57.907	900
						0	1.023	57.857	150
37	440394.314	402289.243	60.155	2.405	1200	1	1.023	57.750	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	Drain Down Time (mins)	240
Ratio-R	0.365	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

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

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

Node 36 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	57.857	Product Number	CTL-SHE-0075-3000-1500-3000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

Node 27.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.369
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1140.0	0.0	1.600	1140.0	0.0	1.601	0.0	0.0

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	71.250	0.051	7.4	0.0581	0.0000	OK
15 minute winter	2	10	70.307	0.059	13.0	0.0663	0.0000	OK
15 minute winter	3	10	69.435	0.085	22.7	0.0962	0.0000	OK
15 minute winter	4	10	69.052	0.098	26.8	0.1104	0.0000	OK
15 minute winter	5	10	68.722	0.094	36.5	0.1065	0.0000	OK
15 minute winter	6	10	69.304	0.055	13.2	0.0623	0.0000	OK
15 minute winter	7	10	68.236	0.136	52.1	0.2398	0.0000	OK
15 minute winter	8	10	67.860	0.100	54.0	0.1772	0.0000	OK
15 minute winter	9	10	66.824	0.143	82.0	0.3645	0.0000	OK
15 minute winter	10	10	66.293	0.162	89.7	0.2856	0.0000	OK
15 minute winter	11	10	66.069	0.160	98.8	0.2822	0.0000	OK
15 minute winter	12	10	70.697	0.054	11.9	0.0608	0.0000	OK
15 minute winter	13	10	70.152	0.057	8.2	0.1011	0.0000	OK
15 minute winter	14	10	69.922	0.126	20.1	0.2222	0.0000	OK
15 minute winter	15	10	69.860	0.130	23.7	0.2289	0.0000	OK
15 minute winter	16	10	69.679	0.105	41.3	0.1855	0.0000	OK
15 minute winter	17	10	68.504	0.081	50.5	0.1426	0.0000	OK
15 minute winter	18	10	65.781	0.253	164.5	0.6447	0.0000	OK
15 minute winter	19	11	65.494	0.299	173.7	0.5282	0.0000	OK
15 minute winter	20	11	65.404	0.296	187.8	0.7523	0.0000	OK
15 minute winter	21	11	65.283	0.280	197.8	0.4940	0.0000	OK
15 minute winter	22	11	64.957	0.158	209.9	0.2799	0.0000	OK
15 minute winter	23	11	62.510	0.167	222.0	0.2957	0.0000	OK
15 minute winter	24	11	60.667	0.174	227.8	0.3072	0.0000	OK
15 minute winter	25	10	60.206	0.040	2.7	0.0450	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	7.4	1.265	0.253	0.2065	
15 minute winter	2	1.001	3	13.0	2.100	0.296	0.0847	
15 minute winter	3	1.002	4	22.7	1.737	0.266	0.1571	
15 minute winter	4	1.003	5	26.8	1.380	0.214	0.5001	
15 minute winter	5	1.004	7	36.4	1.465	0.217	0.5821	
15 minute winter	6	2.000	7	13.2	2.322	0.264	0.0726	
15 minute winter	7	1.005	8	51.8	1.780	0.360	0.4628	
15 minute winter	8	1.006	9	53.6	2.342	0.146	0.6902	
15 minute winter	9	1.007	10	81.2	1.960	0.199	1.2412	
15 minute winter	10	1.008	11	89.1	1.731	0.164	0.6057	
15 minute winter	11	1.009	18	98.0	1.246	0.189	2.6450	
15 minute winter	12	3.000	14	11.9	1.673	0.119	0.1497	
15 minute winter	13	4.000	14	8.2	1.061	0.133	0.1233	
15 minute winter	14	3.001	15	20.1	0.864	0.504	0.2599	
15 minute winter	15	3.002	16	23.6	1.131	0.592	0.5511	
15 minute winter	16	3.003	17	40.9	2.210	0.236	0.8810	
15 minute winter	17	3.004	18	50.0	3.364	0.149	0.4430	
15 minute winter	18	1.010	19	164.8	1.434	0.438	6.3385	
15 minute winter	19	1.011	20	174.6	1.385	0.441	1.6409	
15 minute winter	20	1.012	21	187.8	1.552	0.475	1.9053	
15 minute winter	21	1.013	22	197.4	2.317	0.500	2.6306	
15 minute winter	22	1.014	23	209.0	3.668	0.192	2.8003	
15 minute winter	23	1.015	24	220.7	3.632	0.207	2.3396	
15 minute winter	24	1.016	26	226.1	3.997	0.186	0.8687	
15 minute winter	25	5.000	26	2.7	0.720	0.150	0.0960	

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	26	10	59.599	0.143	225.2	0.2532	0.0000	OK
15 minute summer	27	10	59.634	1.223	224.8	2.1618	0.0000	SURCHARGED
15 minute winter	28	10	59.148	0.072	11.1	0.1273	0.0000	OK
15 minute winter	29	10	59.057	0.105	20.6	0.1854	0.0000	OK
15 minute winter	30	10	59.790	0.054	17.4	0.0957	0.0000	OK
15 minute summer	31	10	59.013	0.150	41.5	0.2649	0.0000	OK
15 minute winter	32	11	58.930	0.204	41.4	0.2302	0.0000	OK
1440 minute winter	27.1	1380	58.712	0.343	16.8	391.1711	0.0000	OK
1440 minute winter	33	1380	58.712	0.671	6.4	1.7072	0.0000	OK
1440 minute winter	34	1380	58.712	0.683	6.3	1.7377	0.0000	OK
1440 minute winter	35	1380	58.712	0.732	5.5	1.8624	0.0000	OK
1440 minute winter	36	1380	58.712	0.855	3.7	2.9610	0.0000	SURCHARGED
720 minute winter	37	270	57.789	0.039	2.6	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)
15 minute summer	26	1.017	27	224.8	1.968	0.105	1.8109	
15 minute summer	27	1.018	27.1	284.7	2.534	0.831	2.4127	
15 minute winter	28	6.000	29	11.1	0.644	0.129	0.3595	
15 minute winter	29	6.001	31	20.5	0.721	0.239	0.4225	
15 minute winter	30	7.000	31	17.4	1.004	0.072	0.4074	
15 minute summer	31	6.002	32	41.3	0.984	0.434	0.7869	
15 minute winter	32	6.003	27.1	40.7	0.925	0.825	1.2455	
1440 minute winter	27.1	1.019	33	6.4	0.516	0.019	2.0312	
1440 minute winter	33	1.020	34	6.1	0.327	0.006	2.6512	
1440 minute winter	34	1.021	35	5.3	0.316	0.006	12.5096	
1440 minute winter	35	1.022	36	3.7	0.327	0.004	18.6471	
1440 minute winter	36	1.023	37	2.6	0.704	0.146	0.0394	194.1

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	71.284	0.085	18.1	0.0964	0.0000	OK
15 minute winter	2	10	70.352	0.104	31.9	0.1176	0.0000	OK
15 minute winter	3	10	69.501	0.151	55.8	0.1705	0.0000	OK
15 minute winter	4	10	69.119	0.165	65.9	0.1863	0.0000	OK
15 minute winter	5	10	68.792	0.164	89.7	0.1850	0.0000	OK
15 minute winter	6	9	69.344	0.095	32.3	0.1077	0.0000	OK
15 minute winter	7	10	68.360	0.260	128.1	0.4591	0.0000	OK
15 minute winter	8	10	67.924	0.164	132.8	0.2892	0.0000	OK
15 minute winter	9	10	66.925	0.244	202.2	0.6207	0.0000	OK
15 minute winter	10	11	66.437	0.306	221.3	0.5409	0.0000	OK
15 minute winter	11	11	66.368	0.459	243.0	0.8119	0.0000	OK
15 minute winter	12	10	70.726	0.083	29.2	0.0937	0.0000	OK
15 minute winter	13	11	70.200	0.105	20.2	0.1847	0.0000	OK
15 minute winter	14	11	70.187	0.391	48.9	0.6907	0.0000	SURCHARGED
15 minute winter	15	11	70.068	0.338	53.7	0.5967	0.0000	SURCHARGED
15 minute winter	16	10	69.745	0.171	94.7	0.3019	0.0000	OK
15 minute winter	17	10	68.544	0.121	117.0	0.2138	0.0000	OK
15 minute winter	18	11	66.282	0.754	370.8	1.9183	0.0000	SURCHARGED
15 minute winter	19	11	65.885	0.690	390.7	1.2184	0.0000	SURCHARGED
15 minute winter	20	11	65.716	0.608	423.0	1.5481	0.0000	SURCHARGED
15 minute winter	21	11	65.495	0.492	447.4	0.8691	0.0000	OK
15 minute winter	22	11	65.051	0.252	476.9	0.4459	0.0000	OK
15 minute winter	23	11	62.613	0.270	506.7	0.4768	0.0000	OK
15 minute winter	24	11	60.791	0.298	526.0	0.5271	0.0000	OK
15 minute winter	25	10	60.231	0.065	6.7	0.0738	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	18.1	1.550	0.618	0.4120	
15 minute winter	2	1.001	3	31.9	2.571	0.727	0.1698	
15 minute winter	3	1.002	4	55.8	2.126	0.654	0.3153	
15 minute winter	4	1.003	5	65.8	1.670	0.527	1.0172	
15 minute winter	5	1.004	7	89.8	1.691	0.536	1.2153	
15 minute winter	6	2.000	7	32.3	2.813	0.646	0.1600	
15 minute winter	7	1.005	8	127.4	2.130	0.887	0.9479	
15 minute winter	8	1.006	9	132.6	2.872	0.362	1.4208	
15 minute winter	9	1.007	10	200.5	2.444	0.492	2.4625	
15 minute winter	10	1.008	11	219.1	2.087	0.404	1.7640	
15 minute winter	11	1.009	18	226.7	1.440	0.437	6.9472	
15 minute winter	12	3.000	14	29.2	1.695	0.292	0.5580	
15 minute winter	13	4.000	14	19.8	1.075	0.321	0.4613	
15 minute winter	14	3.001	15	45.0	1.133	1.132	0.4450	
15 minute winter	15	3.002	16	52.5	1.371	1.317	0.9509	
15 minute winter	16	3.003	17	93.5	2.755	0.538	1.6109	
15 minute winter	17	3.004	18	116.2	3.580	0.347	1.4459	
15 minute winter	18	1.010	19	368.9	1.708	0.981	11.9177	
15 minute winter	19	1.011	20	390.6	1.808	0.987	2.8121	
15 minute winter	20	1.012	21	423.0	1.958	1.070	3.3558	
15 minute winter	21	1.013	22	446.2	2.763	1.130	4.7944	
15 minute winter	22	1.014	23	475.0	4.436	0.437	5.2652	
15 minute winter	23	1.015	24	508.5	4.266	0.477	4.5887	
15 minute winter	24	1.016	26	529.2	4.786	0.434	1.8781	
15 minute winter	25	5.000	26	6.7	0.924	0.375	0.1874	

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	8	59.930	0.474	539.6	0.8374	0.0000	OK
15 minute winter	27	8	59.887	1.476	542.0	2.6076	0.0000	SURCHARGED
15 minute winter	28	11	59.352	0.276	27.2	0.4885	0.0000	OK
15 minute winter	29	11	59.339	0.387	49.4	0.6844	0.0000	SURCHARGED
15 minute winter	30	10	59.821	0.085	42.7	0.1497	0.0000	OK
15 minute winter	31	11	59.304	0.441	94.0	0.7794	0.0000	SURCHARGED
1440 minute winter	32	1410	59.213	0.487	4.9	0.5510	0.0000	SURCHARGED
1440 minute winter	27.1	1410	59.213	0.844	34.2	963.3678	0.0000	SURCHARGED
1440 minute winter	33	1410	59.213	1.172	5.9	2.9833	0.0000	SURCHARGED
1440 minute winter	34	1410	59.213	1.184	5.7	3.0138	0.0000	SURCHARGED
1440 minute winter	35	1410	59.213	1.233	5.0	3.1385	0.0000	SURCHARGED
1440 minute winter	36	1410	59.213	1.356	3.5	4.6979	0.0000	SURCHARGED
1440 minute winter	37	1410	57.790	0.040	2.8	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)
15 minute winter	26	1.017	27	542.0	2.784	0.253	2.8289	
15 minute winter	27	1.018	27.1	556.1	3.214	1.623	2.6638	
15 minute winter	28	6.000	29	26.3	0.725	0.305	1.4241	
15 minute winter	29	6.001	31	44.8	0.741	0.521	1.0426	
15 minute winter	30	7.000	31	42.7	1.165	0.177	0.8070	
15 minute winter	31	6.002	32	90.1	1.280	0.945	1.3068	
1440 minute winter	32	6.003	27.1	4.9	0.495	0.099	1.9975	
1440 minute winter	27.1	1.019	33	5.9	0.509	0.018	3.2770	
1440 minute winter	33	1.020	34	5.6	0.341	0.006	3.2848	
1440 minute winter	34	1.021	35	4.9	0.322	0.005	14.8423	
1440 minute winter	35	1.022	36	3.5	0.318	0.004	20.5463	
1440 minute winter	36	1.023	37	2.8	0.722	0.159	0.0420	236.4

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	71.827	0.628	30.5	0.7098	0.0000	SURCHARGED
15 minute winter	2	11	71.022	0.774	48.3	0.8756	0.0000	SURCHARGED
15 minute winter	3	11	70.009	0.659	83.4	0.7451	0.0000	SURCHARGED
15 minute winter	4	11	69.664	0.710	96.2	0.8030	0.0000	SURCHARGED
15 minute winter	5	11	69.468	0.840	133.0	0.9504	0.0000	SURCHARGED
15 minute winter	6	11	70.207	0.958	54.3	1.0835	0.0000	SURCHARGED
15 minute winter	7	12	69.141	1.041	190.1	1.8388	0.0000	SURCHARGED
15 minute winter	8	11	68.630	0.870	192.9	1.5376	0.0000	SURCHARGED
15 minute winter	9	11	68.353	1.672	296.4	4.2555	0.0000	SURCHARGED
15 minute winter	10	11	68.086	1.955	290.0	3.4544	0.0000	FLOOD RISK
15 minute winter	11	11	67.999	2.090	320.2	3.6938	0.0000	SURCHARGED
15 minute winter	12	11	71.024	0.381	49.2	0.4308	0.0000	SURCHARGED
15 minute winter	13	11	70.917	0.822	33.9	1.4519	0.0000	SURCHARGED
15 minute winter	14	11	70.854	1.058	70.6	1.8688	0.0000	SURCHARGED
15 minute winter	15	11	70.561	0.831	82.5	1.4687	0.0000	SURCHARGED
15 minute winter	16	10	69.805	0.231	149.3	0.4076	0.0000	OK
15 minute winter	17	11	68.664	0.241	188.6	0.4259	0.0000	OK
15 minute winter	18	11	67.798	2.270	552.1	5.7781	0.0000	SURCHARGED
15 minute winter	19	11	66.932	1.737	581.5	3.0695	0.0000	SURCHARGED
15 minute winter	20	11	66.561	1.453	633.7	3.6989	0.0000	SURCHARGED
15 minute winter	21	11	66.075	1.072	672.0	1.8947	0.0000	SURCHARGED
15 minute winter	22	11	65.130	0.331	720.3	0.5841	0.0000	OK
15 minute winter	23	11	62.707	0.364	772.3	0.6428	0.0000	OK
15 minute winter	24	11	60.898	0.405	801.0	0.7153	0.0000	OK
15 minute winter	25	10	60.256	0.090	11.3	0.1016	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	25.1	1.620	0.857	0.6209	
15 minute winter	2	1.001	3	43.3	2.584	0.989	0.2412	
15 minute winter	3	1.002	4	79.2	2.188	0.929	0.4785	
15 minute winter	4	1.003	5	92.9	1.685	0.743	1.8164	
15 minute winter	5	1.004	7	129.9	1.845	0.775	1.6446	
15 minute winter	6	2.000	7	50.1	2.851	1.000	0.2247	
15 minute winter	7	1.005	8	183.9	2.612	1.279	1.1195	
15 minute winter	8	1.006	9	187.0	2.724	0.510	3.3239	
15 minute winter	9	1.007	10	262.2	2.494	0.643	4.7444	
15 minute winter	10	1.008	11	290.9	2.066	0.536	2.5395	
15 minute winter	11	1.009	18	322.9	1.495	0.623	7.2075	
15 minute winter	12	3.000	14	46.3	1.713	0.463	0.8370	
15 minute winter	13	4.000	14	29.0	1.078	0.471	0.6346	
15 minute winter	14	3.001	15	70.0	1.761	1.760	0.4450	
15 minute winter	15	3.002	16	82.1	2.064	2.059	1.0486	
15 minute winter	16	3.003	17	149.0	2.860	0.858	2.7375	
15 minute winter	17	3.004	18	178.3	3.642	0.533	1.9540	
15 minute winter	18	1.010	19	546.7	2.531	1.454	11.9177	
15 minute winter	19	1.011	20	579.2	2.681	1.463	2.8121	
15 minute winter	20	1.012	21	631.1	2.921	1.596	3.4010	
15 minute winter	21	1.013	22	668.8	3.368	1.693	5.5048	
15 minute winter	22	1.014	23	718.7	4.777	0.661	7.4398	
15 minute winter	23	1.015	24	771.6	4.556	0.724	6.5136	
15 minute winter	24	1.016	26	799.9	5.042	0.656	2.5925	
15 minute winter	25	5.000	26	11.3	1.047	0.634	0.3486	

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	7	60.224	0.768	817.4	1.3577	0.0000	SURCHARGED
15 minute winter	27	7	60.139	1.728	821.3	3.0542	0.0000	SURCHARGED
15 minute winter	28	11	60.171	1.095	45.8	1.9342	0.0000	SURCHARGED
15 minute winter	29	11	60.135	1.183	80.1	2.0902	0.0000	SURCHARGED
15 minute winter	30	11	60.114	0.378	71.8	0.6686	0.0000	SURCHARGED
15 minute winter	31	11	60.037	1.174	148.7	2.0747	0.0000	SURCHARGED
1440 minute winter	32	1440	59.865	1.139	7.4	1.2879	0.0000	SURCHARGED
1440 minute winter	27.1	1440	59.865	1.496	55.7	1706.8350	0.0000	SURCHARGED
1440 minute winter	33	1440	59.865	1.824	7.1	4.6414	0.0000	SURCHARGED
1440 minute winter	34	1440	59.865	1.836	7.0	4.6719	0.0000	SURCHARGED
1440 minute winter	35	1440	59.865	1.885	6.0	4.7966	0.0000	SURCHARGED
1440 minute winter	36	1440	59.865	2.008	3.9	6.9548	0.0000	SURCHARGED
1440 minute winter	37	1440	57.794	0.044	3.4	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)
15 minute winter	26	1.017	27	821.3	3.068	0.383	3.0621	
15 minute winter	27	1.018	27.1	829.5	3.929	2.421	3.6394	
15 minute winter	28	6.000	29	41.1	0.730	0.478	1.4502	
15 minute winter	29	6.001	31	75.6	1.074	0.880	1.0426	
15 minute winter	30	7.000	31	66.6	1.173	0.276	1.3104	
15 minute winter	31	6.002	32	149.0	2.116	1.563	1.3068	
1440 minute winter	32	6.003	27.1	7.3	0.515	0.148	1.9975	
1440 minute winter	27.1	1.019	33	7.1	0.524	0.021	3.2770	
1440 minute winter	33	1.020	34	6.8	0.310	0.007	3.2848	
1440 minute winter	34	1.021	35	5.8	0.329	0.006	14.8423	
1440 minute winter	35	1.022	36	3.9	0.292	0.004	20.5463	
1440 minute winter	36	1.023	37	3.4	0.759	0.192	0.0481	273.0

Flow+ v10.3 Copyright © 1988-2022 Causeway Technologies Ltd