Cascade Summary of Results for CAT-B.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	201.123	0.846	0.0	3.4	3.4	275.5	O K
10080 min Summer	201.052	0.775	0.0	3.4	3.4	252.5	O K
15 min Winter	200.644	0.367	0.0	3.4	3.4	119.4	O K
30 min Winter	200.792	0.515	0.0	3.4	3.4	167.6	O K
60 min Winter	200.950	0.673	0.0	3.4	3.4	219.2	O K
120 min Winter	201.125	0.848	0.0	3.4	3.4	276.0	O K
180 min Winter	201.231	0.954	0.0	3.4	3.4	310.7	O K
240 min Winter	201.306	1.029	0.0	3.4	3.4	335.2	O K
360 min Winter	201.408	1.131	0.0	3.4	3.4	368.2	O K
480 min Winter	201.473	1.196	0.0	3.4	3.4	389.4	O K
600 min Winter	201.517	1.240	0.0	3.5	3.5	403.8	O K
720 min Winter	201.547	1.270	0.0	3.5	3.5	413.6	O K
960 min Winter	201.580	1.303	0.0	3.6	3.6	424.4	O K
1440 min Winter	201.588	1.311	0.0	3.6	3.6	426.9	O K
2160 min Winter	201.573	1.296	0.0	3.6	3.6	422.1	O K
2880 min Winter	201.537	1.260	0.0	3.5	3.5	410.2	O K
4320 min Winter	201.440	1.163	0.0	3.4	3.4	378.8	O K
5760 min Winter	201.330	1.053	0.0	3.4	3.4	343.0	O K
7200 min Winter	201.216	0.939	0.0	3.4	3.4	305.9	O K
8640 min Winter	201.099	0.822	0.0	3.4	3.4	267.8	O K
10080 min Winter	200.962	0.685	0.0	3.4	3.4	223.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	1.561	0.0	1078.8	5272
10080 min Summer	1.407	0.0	1134.0	6056
15 min Winter	91.310	0.0	122.6	23
30 min Winter	64.573	0.0	173.4	37
60 min Winter	42.815	0.0	230.0	66
120 min Winter	27.648	0.0	297.1	126
180 min Winter	21.251	0.0	342.5	184
240 min Winter	17.587	0.0	378.1	242
360 min Winter	13.439	0.0	433.5	358
480 min Winter	11.091	0.0	477.1	474
600 min Winter	9.553	0.0	513.5	588
720 min Winter	8.455	0.0	540.4	698
960 min Winter	6.973	0.0	543.9	918
1440 min Winter	5.304	0.0	535.7	1188
2160 min Winter	4.026	0.0	779.2	1648
2880 min Winter	3.307	0.0	853.5	2112
4320 min Winter	2.505	0.0	969.7	3032
5760 min Winter	2.057	0.0	1062.0	3920
7200 min Winter	1.767	0.0	1139.5	4824
8640 min Winter	1.561	0.0	1208.0	5704
10080 min Winter	1.407	0.0	1270.3	6560

Cascade Rainfall Details for CAT-B.SRCX

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.300	Shortest Storm (mins)	15
Ratio R	0.233	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.640

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.000	4	8	0.640

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Cascade Model Details for CAT-B.SRCX

Storage is Online Cover Level (m) 204.200

Cellular Storage Structure

Invert Level (m) 200.277 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.69
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	472.0	0.0	1.676	0.0	0.0
1.675	472.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0084-4000-1755-4000
Design Head (m)	1.755
Design Flow (l/s)	4.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	84
Invert Level (m)	200.197
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.755	4.0
Flush-Flo™	0.369	3.4
Kick-Flo®	0.751	2.7
Mean Flow over Head Range	-	3.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.4	3.000	5.1	7.000	7.6
0.200	3.2	1.400	3.6	3.500	5.5	7.500	7.9
0.300	3.3	1.600	3.8	4.000	5.9	8.000	8.1
0.400	3.4	1.800	4.0	4.500	6.2	8.500	8.4
0.500	3.3	2.000	4.2	5.000	6.5	9.000	8.6
0.600	3.2	2.200	4.4	5.500	6.8	9.500	8.8
0.800	2.8	2.400	4.6	6.000	7.1		
1.000	3.1	2.600	4.8	6.500	7.4		

Cascade Summary of Results for CAT-C.SRCX

Upstream Structures	Outflow To	Overflow To
CAT-B.SRCX	(None)	(None)

Half Drain Time : 180 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	200.083	0.653	0.0	3.2	3.2	137.5	O K
30 min Summer	200.228	0.798	0.0	7.0	7.0	168.0	O K
60 min Summer	200.471	1.041	0.0	7.8	7.8	219.2	O K
120 min Summer	200.753	1.323	0.0	7.8	7.8	278.5	O K
180 min Summer	200.945	1.515	0.0	7.8	7.8	318.8	O K
240 min Summer	201.102	1.672	0.0	7.8	7.8	351.8	O K
360 min Summer	201.397	1.967	16.9	7.8	23.9	352.9	O K
480 min Summer	201.426	1.996	17.6	7.8	24.7	356.3	O K
600 min Summer	201.457	2.027	18.3	7.8	25.5	360.3	O K
720 min Summer	201.473	2.043	18.7	7.8	25.9	362.5	O K
960 min Summer	201.484	2.054	19.0	7.8	26.2	363.9	O K
1440 min Summer	201.442	2.012	18.0	7.8	25.1	358.4	O K
2160 min Summer	201.408	1.978	17.2	7.8	24.2	354.1	O K
2880 min Summer	201.399	1.969	17.0	7.8	24.0	353.3	O K
4320 min Summer	201.396	1.966	11.1	7.8	18.1	353.1	O K
5760 min Summer	201.396	1.966	11.1	7.8	18.1	353.4	O K
7200 min Summer	201.396	1.966	11.1	7.8	18.1	353.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	91.310	0.0	106.3	308
30 min Summer	64.573	0.0	200.2	38
60 min Summer	42.815	0.0	306.3	68
120 min Summer	27.648	0.0	430.7	126
180 min Summer	21.251	0.0	514.9	186
240 min Summer	17.587	0.0	580.4	246
360 min Summer	13.439	0.0	682.8	266
480 min Summer	11.091	0.0	763.0	302
600 min Summer	9.553	0.0	830.0	366
720 min Summer	8.455	0.0	888.1	426
960 min Summer	6.973	0.0	972.8	546
1440 min Summer	5.304	0.0	1044.8	782
2160 min Summer	4.026	0.0	1325.1	1116
2880 min Summer	3.307	0.0	1462.7	1488
4320 min Summer	2.505	0.0	1676.0	2256
5760 min Summer	2.057	0.0	1850.1	3272
7200 min Summer	1.767	0.0	1994.3	3960

Cascade Summary of Results for CAT-C.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	201.395	1.965	2.6	7.8	9.6	352.6	O K
10080 min Summer	200.952	1.522	0.0	7.8	7.8	320.2	O K
15 min Winter	200.085	0.655	0.0	3.3	3.3	137.8	O K
30 min Winter	200.320	0.890	0.0	7.5	7.5	187.4	O K
60 min Winter	200.595	1.165	0.0	7.8	7.8	245.3	O K
120 min Winter	200.916	1.486	0.0	7.8	7.8	312.8	O K
180 min Winter	201.397	1.967	16.9	7.8	23.9	352.8	O K
240 min Winter	201.401	1.971	17.0	7.8	24.0	353.2	O K
360 min Winter	201.481	2.051	18.9	7.8	26.1	363.6	O K
480 min Winter	201.519	2.089	19.8	7.8	27.1	368.7	O K
600 min Winter	201.526	2.096	20.0	7.8	27.3	369.8	O K
720 min Winter	201.519	2.089	19.8	7.8	27.1	368.8	O K
960 min Winter	201.479	2.049	18.9	7.8	26.1	363.3	O K
1440 min Winter	201.404	1.974	17.1	7.8	24.1	353.6	O K
2160 min Winter	201.401	1.971	17.0	7.8	24.0	353.3	O K
2880 min Winter	201.397	1.967	16.9	7.8	23.9	353.2	O K
4320 min Winter	201.396	1.966	11.1	7.8	18.1	353.0	O K
5760 min Winter	201.396	1.966	11.1	7.8	18.1	353.4	O K
7200 min Winter	201.395	1.965	2.6	7.8	9.6	352.7	O K
8640 min Winter	200.829	1.399	0.0	7.8	7.8	294.4	O K
10080 min Winter	200.642	1.212	0.0	7.8	7.8	255.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	1.561	0.0	2121.7	5160
10080 min Summer	1.407	0.0	2236.2	5848
15 min Winter	91.310	0.0	133.5	277
30 min Winter	64.573	0.0	238.5	37
60 min Winter	42.815	0.0	357.6	66
120 min Winter	27.648	0.0	496.8	124
180 min Winter	21.251	0.0	591.0	174
240 min Winter	17.587	0.0	664.5	180
360 min Winter	13.439	0.0	778.9	252
480 min Winter	11.091	0.0	868.2	318
600 min Winter	9.553	0.0	941.0	382
720 min Winter	8.455	0.0	992.8	444
960 min Winter	6.973	0.0	1052.7	562
1440 min Winter	5.304	0.0	1136.0	752
2160 min Winter	4.026	0.0	1498.5	1092
2880 min Winter	3.307	0.0	1652.6	1508
4320 min Winter	2.505	0.0	1880.3	2604
5760 min Winter	2.057	0.0	2086.6	3352
7200 min Winter	1.767	0.0	2248.1	4320
8640 min Winter	1.561	0.0	2390.5	5192
10080 min Winter	1.407	0.0	2519.3	5808

Cascade Rainfall Details for CAT-C.SRCX

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.300	Shortest Storm (mins)	15
Ratio R	0.233	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.690

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.690

Time Area Diagram

Total Area (ha) 0.000

Time From:	(mins) To:	Area (ha)
0	4	0.000

Cascade Model Details for CAT-C.SRCX

Storage is Online Cover Level (m) 202.000

Complex Structure

Cellular Storage

Invert Level (m)	199.430
Infiltration Coefficient Base (m/hr)	202.00000
Infiltration Coefficient Side (m/hr)	0.00000
Safety Factor	2.0
Porosity	0.69

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	305.0	0.0	1.676	0.0	0.0
1.675	305.0	0.0			

Infiltration Basin

Invert Level (m)	199.430	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.50000	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.50000		

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	0.0	1.965	0.0	1.966	121.7	2.366	191.4

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0119-9000-2373-9000
Design Head (m)	2.373
Design Flow (l/s)	9.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	119
Invert Level (m)	200.000
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.373	9.0
Flush-Flo™	0.519	7.8
Kick-Flo®	1.065	6.2
Mean Flow over Head Range	-	7.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be

Hydro-Brake® Optimum Outflow Control

invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	1.200	6.5	3.000	10.0	7.000	15.0
0.200	6.7	1.400	7.0	3.500	10.8	7.500	15.5
0.300	7.4	1.600	7.5	4.000	11.5	8.000	16.0
0.400	7.7	1.800	7.9	4.500	12.2	8.500	16.5
0.500	7.8	2.000	8.3	5.000	12.8	9.000	16.9
0.600	7.8	2.200	8.7	5.500	13.4	9.500	17.4
0.800	7.5	2.400	9.0	6.000	14.0		
1.000	6.7	2.600	9.4	6.500	14.5		

Appendix C : Surface Water Network Model

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	18.300	Add Flow / Climate Change (%)	20
Ratio R	0.233	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	51.674	0.738	70.0	0.110	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	5.749	0.115	50.0	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	23.554	0.471	50.0	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	26.085	0.153	170.0	0.053	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	17.708	0.089	199.0	0.031	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	14.341	0.072	199.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	55.421	0.277	200.0	0.087	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	29.753	0.175	170.0	0.063	4.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.55	203.029	0.110	0.0	0.0	3.0	1.57	62.2	17.9
1.001	50.00	4.60	202.290	0.119	0.0	0.0	3.2	1.85	73.7	19.3
1.002	50.00	4.81	202.176	0.156	0.0	0.0	4.2	1.85	73.7	25.3
2.000	50.00	4.43	201.857	0.053	0.0	0.0	1.4	1.00	39.8	8.6
1.003	50.00	5.08	201.704	0.240	0.0	0.0	6.5	1.11	78.5	39.0
1.004	50.00	5.29	201.615	0.266	0.0	0.0	7.2	1.11	78.5	43.2
1.005	50.00	6.13	201.543	0.353	0.0	0.0	9.6	1.11	78.3	57.4
3.000	50.00	4.50	201.441	0.063	0.0	0.0	1.7	1.00	39.8	10.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.000	28.837	0.169	171.0	0.095	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	87.095	0.917	95.0	0.195	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	6.530	0.050	131.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	19.003	0.143	133.0	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	18.173	0.180	101.0	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	40.690	0.946	43.0	0.070	4.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	24.302	0.442	55.0	0.046	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	38.489	0.987	39.0	0.059	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	35.332	0.283	124.8	0.048	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	24.115	0.096	251.2	0.079	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.003	49.707	0.199	250.0	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	36.108	0.271	133.0	0.072	4.00	0.0	0.600	o	225	Pipe/Conduit	
8.001	17.001	0.085	200.0	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.002	74.433	0.967	77.0	0.090	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	4.48	201.435	0.095	0.0	0.0	2.6	1.00	39.6	15.4
1.006	50.00	6.82	201.266	0.706	0.0	0.0	19.1	2.09	331.8	114.7
1.007	50.00	6.89	200.353	0.723	0.0	0.0	19.6	1.77	282.3	117.5
1.008	50.00	7.06	200.303	0.769	0.0	0.0	20.8	1.76	280.1	125.0
1.009	50.00	7.30	200.160	0.784	0.0	0.0	21.2	1.30	51.7«	127.4
5.000	50.00	4.34	203.295	0.070	0.0	0.0	1.9	2.00	79.5	11.4
6.000	50.00	4.23	202.795	0.046	0.0	0.0	1.2	1.77	70.3	7.5
5.001	50.00	4.64	202.355	0.175	0.0	0.0	4.7	2.10	83.5	28.4
7.000	50.00	4.50	200.775	0.048	0.0	0.0	1.3	1.17	46.5	7.8
5.002	50.00	5.05	200.492	0.302	0.0	0.0	8.2	0.99	69.8	49.1
5.003	50.00	5.89	200.396	0.362	0.0	0.0	9.8	0.99	70.0	58.8
8.000	50.00	4.53	204.775	0.072	0.0	0.0	1.9	1.13	45.0	11.7
8.001	50.00	4.84	204.504	0.102	0.0	0.0	2.8	0.92	36.6	16.6
8.002	50.00	5.67	204.419	0.192	0.0	0.0	5.2	1.49	59.3	31.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
8.003	11.871	0.118	101.0	0.007	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.004	28.108	0.050	562.2	0.013	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.005	19.242	0.080	240.5	0.008	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.004	8.665	0.087	99.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	19.616	0.490	40.0	0.023	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.005	18.746	0.110	170.4	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.006	40.332	0.237	170.2	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.007	56.061	0.333	168.4	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.008	29.128	0.073	399.0	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.009	12.780	0.076	168.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.000	32.565	0.534	61.0	0.063	4.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	36.443	0.597	61.0	0.062	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.002	64.873	1.063	61.0	0.063	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.003	65.456	1.073	61.0	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.004	35.915	0.589	61.0	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.000	28.866	0.481	60.0	0.041	4.00	0.0	0.600	o	225	Pipe/Conduit	
11.001	21.657	0.361	60.0	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
8.003	50.00	5.80	201.175	0.199	0.0	0.0	5.4	1.56	110.6	32.3
8.004	50.00	6.51	200.277	0.212	0.0	0.0	5.7	0.66	46.4	34.4
8.005	50.00	6.83	200.227	0.220	0.0	0.0	6.0	1.01	71.3	35.7
5.004	50.00	6.90	200.197	0.582	0.0	0.0	15.8	2.04	324.0	94.6
9.000	50.00	4.16	200.597	0.023	0.0	0.0	0.6	2.07	82.5	3.7
5.005	50.00	7.16	200.110	0.622	0.0	0.0	16.8	1.20	84.9«	101.1
5.006	50.00	7.72	200.000	0.673	0.0	0.0	18.2	1.20	85.0«	109.4
5.007	50.00	8.49	199.763	0.735	0.0	0.0	19.9	1.21	85.5«	119.4
5.008	49.93	9.11	199.430	0.745	0.0	0.0	20.2	0.78	55.2«	120.9
5.009	49.53	9.29	199.357	0.745	0.0	0.0	20.2	1.21	85.5«	120.9
10.000	50.00	4.32	205.373	0.063	0.0	0.0	1.7	1.68	66.7	10.2
10.001	50.00	4.69	204.839	0.125	0.0	0.0	3.4	1.68	66.7	20.3
10.002	50.00	5.33	204.242	0.188	0.0	0.0	5.1	1.68	66.7	30.5
10.003	50.00	5.87	203.178	0.268	0.0	0.0	7.3	2.02	142.5	43.5
10.004	50.00	6.17	202.105	0.298	0.0	0.0	8.1	2.02	142.5	48.4
11.000	50.00	4.28	203.196	0.041	0.0	0.0	1.1	1.69	67.3	6.7
11.001	50.00	4.46	202.714	0.064	0.0	0.0	1.7	2.03	143.7	10.4

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
12.000	13.582	0.110	123.0	0.029	4.00	0.0	0.600	o	300	Pipe/Conduit	
11.002	56.454	0.656	86.0	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.005	9.046	0.156	58.0	0.009	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.006	11.049	0.037	296.0	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.007	18.213	0.040	455.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.008	5.932	0.015	395.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.010	2.034	0.012	169.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.000	50.00	4.16	202.280	0.029	0.0	0.0	0.8	1.42	100.1	4.7
11.002	50.00	5.02	202.172	0.173	0.0	0.0	4.7	1.70	119.9	28.1
10.005	50.00	6.22	201.516	0.480	0.0	0.0	13.0	2.67	425.2	78.0
10.006	50.00	6.38	201.359	0.492	0.0	0.0	13.3	1.18	187.1	79.9
10.007	50.00	6.70	201.323	0.492	0.0	0.0	13.3	0.95	150.5	79.9
10.008	50.00	6.80	201.283	0.492	0.0	0.0	13.3	1.02	161.6	79.9
5.010	49.46	9.32	199.281	1.237	0.0	0.0	33.1	1.20	85.2«	198.8

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	205.916	2.887	Open Manhole	1200	1.000	203.029	225				
2	204.913	2.623	Open Manhole	1200	1.001	202.290	225	1.000	202.291	225	1
3	204.830	2.655	Open Manhole	1200	1.002	202.176	225	1.001	202.175	225	
4	204.935	3.078	Open Manhole	1200	2.000	201.857	225				
4	204.506	2.802	Open Manhole	1200	1.003	201.704	300	1.002	201.705	225	
								2.000	201.704	225	
5	204.763	3.148	Open Manhole	1200	1.004	201.615	300	1.003	201.615	300	
6	204.443	2.900	Open Manhole	1200	1.005	201.543	300	1.004	201.543	300	
7	202.866	1.425	Open Manhole	1200	3.000	201.441	225				
8	204.702	3.267	Open Manhole	1200	4.000	201.435	225				
7	203.923	2.657	Open Manhole	1350	1.006	201.266	450	1.005	201.266	300	
								3.000	201.266	225	
								4.000	201.266	225	
8	202.008	1.659	Open Manhole	1350	1.007	200.353	450	1.006	200.349	450	
9	202.500	2.197	Open Manhole	1350	1.008	200.303	450	1.007	200.303	450	
10	202.160	2.000	Open Manhole	1350	1.009	200.160	225	1.008	200.160	450	
11	202.063	2.083	Open Manhole	225		OUTFALL		1.009	199.980	225	
14	204.672	1.377	Open Manhole	1200	5.000	203.295	225				
15	204.129	1.334	Open Manhole	1200	6.000	202.795	225				
15	203.765	1.416	Open Manhole	1200	5.001	202.355	225	5.000	202.349	225	
								6.000	202.353	225	
16	202.157	1.382	Open Manhole	1200	7.000	200.775	225				
16	202.750	2.258	Open Manhole	1200	5.002	200.492	300	5.001	201.368	225	801
								7.000	200.492	225	
17	202.421	2.025	Open Manhole	1200	5.003	200.396	300	5.002	200.396	300	
20	206.232	1.457	Open Manhole	1200	8.000	204.775	225				
21	206.274	1.770	Open Manhole	1200	8.001	204.504	225	8.000	204.504	225	
22	206.287	1.868	Open Manhole	1200	8.002	204.419	225	8.001	204.419	225	
23	204.878	3.703	Open Manhole	1200	8.003	201.175	300	8.002	203.452	225	2202
24	205.732	5.455	Open Manhole	1200	8.004	200.277	300	8.003	201.057	300	780
25	203.646	3.419	Open Manhole	1200	8.005	200.227	300	8.004	200.227	300	
18	203.100	2.953	Open Manhole	1350	5.004	200.197	450	5.003	200.197	300	
								8.005	200.147	300	
19	202.910	2.313	Open Manhole	1200	9.000	200.597	225				
19	202.132	2.025	Open Manhole	1350	5.005	200.110	300	5.004	200.110	450	
								9.000	200.107	225	
20	201.478	1.478	Open Manhole	1200	5.006	200.000	300	5.005	200.000	300	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
21	201.322	1.559	Open Manhole	1200	5.007	199.763	300	5.006	199.763	300	
22	201.070	1.640	Open Manhole	1200	5.008	199.430	300	5.007	199.430	300	
23	202.200	2.843	Open Manhole	1200	5.009	199.357	300	5.008	199.357	300	
34	206.769	1.396	Open Manhole	1200	10.000	205.373	225				
35	207.579	2.740	Open Manhole	1200	10.001	204.839	225	10.000	204.839	225	
36	207.815	3.573	Open Manhole	1200	10.002	204.242	225	10.001	204.242	225	
37	206.412	3.234	Open Manhole	1200	10.003	203.178	300	10.002	203.179	225	
38	204.238	2.133	Open Manhole	1200	10.004	202.105	300	10.003	202.105	300	
39	206.460	3.264	Open Manhole	1200	11.000	203.196	225				
40	205.199	2.485	Open Manhole	1200	11.001	202.714	300	11.000	202.715	225	
41	203.816	1.536	Open Manhole	1200	12.000	202.280	300				
41	204.253	2.083	Open Manhole	1200	11.002	202.172	300	11.001	202.353	300	181
								12.000	202.170	300	
39	203.055	1.539	Open Manhole	1350	10.005	201.516	450	10.004	201.516	300	
								11.002	201.516	300	
40	202.178	0.819	Open Manhole	1350	10.006	201.359	450	10.005	201.360	450	1
44	201.773	0.451	Open Manhole	450	10.007	201.323	450	10.006	201.322	450	
45	201.733	0.450	Open Manhole	1350	10.008	201.283	450	10.007	201.283	450	
24	201.718	2.437	Open Manhole	1350	5.010	199.281	300	5.009	199.281	300	
								10.008	201.268	450	2137
34	199.769	0.500	Open Manhole	225		OUTFALL		5.010	199.269	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	698080.070	714716.451	698080.070	714716.451	Required	
2	698044.557	714678.915	698044.557	714678.915	Required	
3	698043.844	714673.210	698043.844	714673.210	Required	
4	698046.540	714638.202	698046.540	714638.202	Required	
4	698027.608	714656.146	698027.608	714656.146	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
5	698015.487	714643.236	698015.487	714643.236	Required	
6	698001.146	714643.139	698001.146	714643.139	Required	
7	697942.485	714581.385	697942.485	714581.385	Required	
8	697983.889	714583.174	697983.889	714583.174	Required	
7	697962.941	714602.992	697962.941	714602.992	Required	
8	697899.748	714662.926	697899.748	714662.926	Required	
9	697893.563	714660.829	697893.563	714660.829	Required	
10	697879.813	714673.945	697879.813	714673.945	Required	
11	697861.685	714672.658			No Entry	
14	697996.163	714704.814	697996.163	714704.814	Required	
15	697985.895	714658.473	697985.895	714658.473	Required	
15	697968.262	714675.196	697968.262	714675.196	Required	
16	697916.011	714676.025	697916.011	714676.025	Required	
16	697940.319	714701.665	697940.319	714701.665	Required	
17	697922.802	714718.238	697922.802	714718.238	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
20	698091.402	714733.606	698091.402	714733.606	Required	
21	698065.683	714758.951	698065.683	714758.951	Required	
22	698051.102	714767.693	698051.102	714767.693	Required	
23	697999.973	714713.601	697999.973	714713.601	Required	
24	697991.387	714721.798	697991.387	714721.798	Required	
25	697970.948	714741.094	697970.948	714741.094	Required	
18	697956.981	714754.329	697956.981	714754.329	Required	
19	697974.821	714760.863	697974.821	714760.863	Required	
19	697955.303	714762.830	697955.303	714762.830	Required	
20	697936.869	714766.240	697936.869	714766.240	Required	
21	697941.624	714806.291	697941.624	714806.291	Required	
22	697948.267	714861.957	697948.267	714861.957	Required	
23	697977.205	714858.637	697977.205	714858.637	Required	
34	698107.423	714720.812	698107.423	714720.812	Required	
35	698130.063	714744.219	698130.063	714744.219	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
36	698149.292	714775.177	698149.292	714775.177	Required	
37	698093.747	714808.693	698093.747	714808.693	Required	
38	698037.734	714842.560	698037.734	714842.560	Required	
39	698041.668	714773.308	698041.668	714773.308	Required	
40	698016.979	714788.264	698016.979	714788.264	Required	
41	697994.099	714777.287	697994.099	714777.287	Required	
41	697995.471	714790.799	697995.471	714790.799	Required	
39	698002.078	714846.865	698002.078	714846.865	Required	
40	698001.340	714855.881	698001.340	714855.881	Required	
44	697992.995	714863.123	697992.995	714863.123	Required	
45	697975.104	714866.532	697975.104	714866.532	Required	
24	697978.573	714871.344	697978.573	714871.344	Required	
34	697978.895	714873.352			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	205.916	203.029	2.662	Open Manhole	1200
1.001	o	225	2	204.913	202.290	2.398	Open Manhole	1200
1.002	o	225	3	204.830	202.176	2.429	Open Manhole	1200
2.000	o	225	4	204.935	201.857	2.853	Open Manhole	1200
1.003	o	300	4	204.506	201.704	2.502	Open Manhole	1200
1.004	o	300	5	204.763	201.615	2.848	Open Manhole	1200
1.005	o	300	6	204.443	201.543	2.600	Open Manhole	1200
3.000	o	225	7	202.866	201.441	1.200	Open Manhole	1200
4.000	o	225	8	204.702	201.435	3.042	Open Manhole	1200
1.006	o	450	7	203.923	201.266	2.207	Open Manhole	1350
1.007	o	450	8	202.008	200.353	1.205	Open Manhole	1350
1.008	o	450	9	202.500	200.303	1.747	Open Manhole	1350
1.009	o	225	10	202.160	200.160	1.775	Open Manhole	1350
5.000	o	225	14	204.672	203.295	1.152	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	51.674	70.0	2	204.913	202.291	2.397	Open Manhole	1200
1.001	5.749	50.0	3	204.830	202.175	2.430	Open Manhole	1200
1.002	23.554	50.0	4	204.506	201.705	2.576	Open Manhole	1200
2.000	26.085	170.0	4	204.506	201.704	2.577	Open Manhole	1200
1.003	17.708	199.0	5	204.763	201.615	2.848	Open Manhole	1200
1.004	14.341	199.0	6	204.443	201.543	2.600	Open Manhole	1200
1.005	55.421	200.0	7	203.923	201.266	2.357	Open Manhole	1350
3.000	29.753	170.0	7	203.923	201.266	2.432	Open Manhole	1350
4.000	28.837	171.0	7	203.923	201.266	2.432	Open Manhole	1350
1.006	87.095	95.0	8	202.008	200.349	1.209	Open Manhole	1350
1.007	6.530	131.0	9	202.500	200.303	1.747	Open Manhole	1350
1.008	19.003	133.0	10	202.160	200.160	1.550	Open Manhole	1350
1.009	18.173	101.0	11	202.063	199.980	1.858	Open Manhole	225
5.000	40.690	43.0	15	203.765	202.349	1.191	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.000	o	225	15	204.129	202.795	1.109	Open Manhole	1200
5.001	o	225	15	203.765	202.355	1.185	Open Manhole	1200
7.000	o	225	16	202.157	200.775	1.157	Open Manhole	1200
5.002	o	300	16	202.750	200.492	1.958	Open Manhole	1200
5.003	o	300	17	202.421	200.396	1.725	Open Manhole	1200
8.000	o	225	20	206.232	204.775	1.232	Open Manhole	1200
8.001	o	225	21	206.274	204.504	1.545	Open Manhole	1200
8.002	o	225	22	206.287	204.419	1.643	Open Manhole	1200
8.003	o	300	23	204.878	201.175	3.403	Open Manhole	1200
8.004	o	300	24	205.732	200.277	5.155	Open Manhole	1200
8.005	o	300	25	203.646	200.227	3.119	Open Manhole	1200
5.004	o	450	18	203.100	200.197	2.453	Open Manhole	1350
9.000	o	225	19	202.910	200.597	2.088	Open Manhole	1200
5.005	o	300	19	202.132	200.110	1.722	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.000	24.302	55.0	15	203.765	202.353	1.187	Open Manhole	1200
5.001	38.489	39.0	16	202.750	201.368	1.157	Open Manhole	1200
7.000	35.332	124.8	16	202.750	200.492	2.033	Open Manhole	1200
5.002	24.115	251.2	17	202.421	200.396	1.725	Open Manhole	1200
5.003	49.707	250.0	18	203.100	200.197	2.603	Open Manhole	1350
8.000	36.108	133.0	21	206.274	204.504	1.545	Open Manhole	1200
8.001	17.001	200.0	22	206.287	204.419	1.643	Open Manhole	1200
8.002	74.433	77.0	23	204.878	203.452	1.201	Open Manhole	1200
8.003	11.871	101.0	24	205.732	201.057	4.375	Open Manhole	1200
8.004	28.108	562.2	25	203.646	200.227	3.119	Open Manhole	1200
8.005	19.242	240.5	18	203.100	200.147	2.653	Open Manhole	1350
5.004	8.665	99.6	19	202.132	200.110	1.572	Open Manhole	1350
9.000	19.616	40.0	19	202.132	200.107	1.800	Open Manhole	1350
5.005	18.746	170.4	20	201.478	200.000	1.178	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	o	300	20	201.478	200.000	1.178	Open Manhole	1200
5.007	o	300	21	201.322	199.763	1.259	Open Manhole	1200
5.008	o	300	22	201.070	199.430	1.340	Open Manhole	1200
5.009	o	300	23	202.200	199.357	2.543	Open Manhole	1200
10.000	o	225	34	206.769	205.373	1.171	Open Manhole	1200
10.001	o	225	35	207.579	204.839	2.515	Open Manhole	1200
10.002	o	225	36	207.815	204.242	3.348	Open Manhole	1200
10.003	o	300	37	206.412	203.178	2.934	Open Manhole	1200
10.004	o	300	38	204.238	202.105	1.833	Open Manhole	1200
11.000	o	225	39	206.460	203.196	3.039	Open Manhole	1200
11.001	o	300	40	205.199	202.714	2.185	Open Manhole	1200
12.000	o	300	41	203.816	202.280	1.236	Open Manhole	1200
11.002	o	300	41	204.253	202.172	1.781	Open Manhole	1200
10.005	o	450	39	203.055	201.516	1.089	Open Manhole	1350
10.006	o	450	40	202.178	201.359	0.369	Open Manhole	1350
10.007	o	450	44	201.773	201.323	0.000	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	40.332	170.2	21	201.322	199.763	1.259	Open Manhole	1200
5.007	56.061	168.4	22	201.070	199.430	1.340	Open Manhole	1200
5.008	29.128	399.0	23	202.200	199.357	2.543	Open Manhole	1200
5.009	12.780	168.2	24	201.718	199.281	2.137	Open Manhole	1350
10.000	32.565	61.0	35	207.579	204.839	2.515	Open Manhole	1200
10.001	36.443	61.0	36	207.815	204.242	3.348	Open Manhole	1200
10.002	64.873	61.0	37	206.412	203.179	3.008	Open Manhole	1200
10.003	65.456	61.0	38	204.238	202.105	1.833	Open Manhole	1200
10.004	35.915	61.0	39	203.055	201.516	1.239	Open Manhole	1350
11.000	28.866	60.0	40	205.199	202.715	2.259	Open Manhole	1200
11.001	21.657	60.0	41	204.253	202.353	1.600	Open Manhole	1200
12.000	13.582	123.0	41	204.253	202.170	1.783	Open Manhole	1200
11.002	56.454	86.0	39	203.055	201.516	1.239	Open Manhole	1350
10.005	9.046	58.0	40	202.178	201.360	0.368	Open Manhole	1350
10.006	11.049	296.0	44	201.773	201.322	0.001	Open Manhole	450
10.007	18.213	455.3	45	201.733	201.283	0.000	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.008	o	450	45	201.733	201.283	0.000	Open Manhole	1350
5.010	o	300	24	201.718	199.281	2.137	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.008	5.932	395.5	24	201.718	201.268	0.000	Open Manhole	1350
5.010	2.034	169.5	34	199.769	199.269	0.200	Open Manhole	225

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	11	202.063	199.980	199.980	225	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
5.010	34	199.769	199.269	199.269	225	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model FSR Return Period (years) 5

Synthetic Rainfall Details

Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840
Ratio R	0.233	Storm Duration (mins)	30
Profile Type	Summer		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 10, DS/PN: 1.009, Volume (m³): 5.7

Unit Reference	MD-SHE-0105-6000-1675-6000
Design Head (m)	1.675
Design Flow (l/s)	6.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	105
Invert Level (m)	200.160
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.675	6.0
Flush-Flo™	0.458	5.8
Kick-Flo®	0.939	4.6
Mean Flow over Head Range	-	5.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.5	1.200	5.1	3.000	7.9	7.000	11.8
0.200	5.2	1.400	5.5	3.500	8.5	7.500	12.2
0.300	5.6	1.600	5.9	4.000	9.0	8.000	12.6
0.400	5.8	1.800	6.2	4.500	9.5	8.500	12.9
0.500	5.8	2.000	6.5	5.000	10.0	9.000	13.3
0.600	5.7	2.200	6.8	5.500	10.5	9.500	13.6
0.800	5.3	2.400	7.1	6.000	10.9		
1.000	4.7	2.600	7.4	6.500	11.4		

Hydro-Brake® Optimum Manhole: 18, DS/PN: 5.004, Volume (m³): 8.8

Unit Reference	MD-SHE-0084-4000-1755-4000
Design Head (m)	1.755
Design Flow (l/s)	4.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	84
Invert Level (m)	200.197
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Hydro-Brake® Optimum Manhole: 18, DS/PN: 5.004, Volume (m³): 8.8

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.755	4.0
Flush-Flo™	0.369	3.4
Kick-Flo®	0.751	2.7
Mean Flow over Head Range	-	3.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.4	3.000	5.1	7.000	7.6
0.200	3.2	1.400	3.6	3.500	5.5	7.500	7.9
0.300	3.3	1.600	3.8	4.000	5.9	8.000	8.1
0.400	3.4	1.800	4.0	4.500	6.2	8.500	8.4
0.500	3.3	2.000	4.2	5.000	6.5	9.000	8.6
0.600	3.2	2.200	4.4	5.500	6.8	9.500	8.8
0.800	2.8	2.400	4.6	6.000	7.1		
1.000	3.1	2.600	4.8	6.500	7.4		

Hydro-Brake® Optimum Manhole: 24, DS/PN: 5.010, Volume (m³): 5.0

Unit Reference	MD-SHE-0118-9000-2449-9000
Design Head (m)	2.449
Design Flow (l/s)	9.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	118
Invert Level (m)	199.281
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.449	9.0
Flush-Flo™	0.517	7.7
Kick-Flo®	1.058	6.1
Mean Flow over Head Range	-	7.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.300	7.3	0.500	7.7	0.800	7.3
0.200	6.6	0.400	7.6	0.600	7.6	1.000	6.5

Hydro-Brake® Optimum Manhole: 24, DS/PN: 5.010, Volume (m³): 5.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	6.4	2.400	8.9	5.000	12.6	8.000	15.8
1.400	6.9	2.600	9.2	5.500	13.2	8.500	16.2
1.600	7.4	3.000	9.9	6.000	13.8	9.000	16.7
1.800	7.8	3.500	10.6	6.500	14.3	9.500	17.1
2.000	8.2	4.000	11.3	7.000	14.8		
2.200	8.5	4.500	12.0	7.500	15.3		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.009

Invert Level (m) 200.160 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01889 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.01889

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	342.4	342.4	1.676	0.0	342.4
1.675	342.4	342.4			

Cellular Storage Manhole: 25, DS/PN: 8.005

Invert Level (m) 200.227 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.06174 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.06174

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	236.3	236.3	1.676	0.0	236.3
1.675	236.3	236.3			

Complex Manhole: 24, DS/PN: 5.010

Cellular Storage

Invert Level (m) 199.281 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	369.5	369.5	1.676	0.0	369.5
1.675	369.5	369.5			

Infiltration Basin

Invert Level (m) 199.281 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	120.9	0.407	187.6	0.441	219.9

Summary of Results for 30 minute 5 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	203.127	-0.127	0.000	0.38			22.7	OK
1.001	2	202.405	-0.110	0.000	0.51			24.4	OK
1.002	3	202.282	-0.119	0.000	0.46			30.8	OK
2.000	4	201.942	-0.140	0.000	0.30			11.0	OK
1.003	4	201.889	-0.115	0.000	0.69			46.2	OK
1.004	5	201.816	-0.099	0.000	0.78			51.1	OK
1.005	6	201.761	-0.082	0.000	0.86			63.5	OK
3.000	7	201.534	-0.132	0.000	0.35			13.0	OK
4.000	8	201.554	-0.106	0.000	0.53			19.7	OK
1.006	7	201.462	-0.254	0.000	0.39			120.7	OK
1.007	8	200.641	-0.162	0.000	0.73			123.9	OK
1.008	9	200.558	-0.195	0.000	0.61			130.5	OK
1.009	10	200.514	0.129	0.000	0.12			5.7	SURCHARGED
5.000	14	203.363	-0.157	0.000	0.19			14.5	OK
6.000	15	202.853	-0.167	0.000	0.15			9.7	OK
5.001	15	202.459	-0.121	0.000	0.44			34.5	OK
7.000	16	200.867	-0.133	0.000	0.22			9.8	OK
5.002	16	200.845	0.053	0.000	0.85			52.6	SURCHARGED
5.003	17	200.781	0.085	0.000	0.91			60.0	SURCHARGED
8.000	20	204.868	-0.132	0.000	0.35			14.9	OK
8.001	21	204.631	-0.098	0.000	0.61			19.8	OK
8.002	22	204.547	-0.097	0.000	0.61			35.3	OK
8.003	23	201.311	-0.164	0.000	0.42			36.3	OK
8.004	24	200.562	-0.015	0.000	0.91			38.0	OK
8.005	25	200.559	0.032	0.000	0.04			2.7	SURCHARGED
5.004	18	200.606	-0.041	0.000	0.02			3.4	OK
9.000	19	200.634	-0.188	0.000	0.07			4.8	OK
5.005	19	200.188	-0.222	0.000	0.15			11.1	OK
5.006	20	200.102	-0.198	0.000	0.25			19.5	OK
5.007	21	199.890	-0.173	0.000	0.36			29.4	OK
5.008	22	199.601	-0.129	0.000	0.61			30.6	OK
5.009	23	199.497	-0.160	0.000	0.44			30.6	OK
10.000	34	205.443	-0.155	0.000	0.21			13.1	OK
10.001	35	204.935	-0.129	0.000	0.38			23.8	OK
10.002	36	204.359	-0.108	0.000	0.53			33.9	OK
10.003	37	203.301	-0.177	0.000	0.35			47.0	OK
10.004	38	202.236	-0.169	0.000	0.39			51.5	OK
11.000	39	203.252	-0.169	0.000	0.14			8.6	OK
11.001	40	202.777	-0.237	0.000	0.10			12.5	OK
12.000	41	202.334	-0.246	0.000	0.07			6.1	OK
11.002	41	202.281	-0.191	0.000	0.28			31.9	OK
10.005	39	201.707	-0.259	0.000	0.38			84.3	OK

Summary of Results for 30 minute 5 year Summer (Storm)

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
10.006	40	201.657	-0.152	0.000	0.63			84.7	OK
10.007	44	201.632	-0.141	0.000	0.79			84.6	FLOOD RISK
10.008	45	201.577	-0.156	0.000	0.75			83.6	FLOOD RISK
5.010	24	199.481	-0.100	0.000	0.11			6.1	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.300	Add Flow / Climate Change (%)	20
Ratio R	0.233	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	51.674	0.738	70.0	0.110	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	5.749	0.115	50.0	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	23.554	0.471	50.0	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	26.085	0.153	170.0	0.053	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	17.708	0.089	199.0	0.031	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	14.341	0.072	199.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	55.421	0.277	200.0	0.087	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	29.753	0.175	170.0	0.063	4.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.55	203.029	0.110	0.0	0.0	3.0	1.57	62.2	17.9
1.001	50.00	4.60	202.290	0.119	0.0	0.0	3.2	1.85	73.7	19.3
1.002	50.00	4.81	202.176	0.156	0.0	0.0	4.2	1.85	73.7	25.3
2.000	50.00	4.43	201.857	0.053	0.0	0.0	1.4	1.00	39.8	8.6
1.003	50.00	5.08	201.704	0.240	0.0	0.0	6.5	1.11	78.5	39.0
1.004	50.00	5.29	201.615	0.266	0.0	0.0	7.2	1.11	78.5	43.2
1.005	50.00	6.13	201.543	0.353	0.0	0.0	9.6	1.11	78.3	57.4
3.000	50.00	4.50	201.441	0.063	0.0	0.0	1.7	1.00	39.8	10.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.000	28.837	0.169	171.0	0.095	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	87.095	0.917	95.0	0.195	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	6.530	0.050	131.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	19.003	0.143	133.0	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	18.173	0.180	101.0	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	40.690	0.946	43.0	0.070	4.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	24.302	0.442	55.0	0.046	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	38.489	0.987	39.0	0.059	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	35.332	0.283	124.8	0.048	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	24.115	0.096	251.2	0.079	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.003	49.707	0.199	250.0	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	36.108	0.271	133.0	0.072	4.00	0.0	0.600	o	225	Pipe/Conduit	
8.001	17.001	0.085	200.0	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.002	74.433	0.967	77.0	0.090	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	4.48	201.435	0.095	0.0	0.0	2.6	1.00	39.6	15.4
1.006	50.00	6.82	201.266	0.706	0.0	0.0	19.1	2.09	331.8	114.7
1.007	50.00	6.89	200.353	0.723	0.0	0.0	19.6	1.77	282.3	117.5
1.008	50.00	7.06	200.303	0.769	0.0	0.0	20.8	1.76	280.1	125.0
1.009	50.00	7.30	200.160	0.784	0.0	0.0	21.2	1.30	51.7«	127.4
5.000	50.00	4.34	203.295	0.070	0.0	0.0	1.9	2.00	79.5	11.4
6.000	50.00	4.23	202.795	0.046	0.0	0.0	1.2	1.77	70.3	7.5
5.001	50.00	4.64	202.355	0.175	0.0	0.0	4.7	2.10	83.5	28.4
7.000	50.00	4.50	200.775	0.048	0.0	0.0	1.3	1.17	46.5	7.8
5.002	50.00	5.05	200.492	0.302	0.0	0.0	8.2	0.99	69.8	49.1
5.003	50.00	5.89	200.396	0.362	0.0	0.0	9.8	0.99	70.0	58.8
8.000	50.00	4.53	204.775	0.072	0.0	0.0	1.9	1.13	45.0	11.7
8.001	50.00	4.84	204.504	0.102	0.0	0.0	2.8	0.92	36.6	16.6
8.002	50.00	5.67	204.419	0.192	0.0	0.0	5.2	1.49	59.3	31.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
8.003	11.871	0.118	101.0	0.007	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.004	28.108	0.050	562.2	0.013	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.005	19.242	0.080	240.5	0.008	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.004	8.665	0.087	99.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	19.616	0.490	40.0	0.023	4.00	0.0	0.600	o	225	Pipe/Conduit	
5.005	18.746	0.110	170.4	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.006	40.332	0.237	170.2	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.007	56.061	0.333	168.4	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.008	29.128	0.073	399.0	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.009	12.780	0.076	168.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.000	32.565	0.534	61.0	0.063	4.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	36.443	0.597	61.0	0.062	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.002	64.873	1.063	61.0	0.063	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.003	65.456	1.073	61.0	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.004	35.915	0.589	61.0	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.000	28.866	0.481	60.0	0.041	4.00	0.0	0.600	o	225	Pipe/Conduit	
11.001	21.657	0.361	60.0	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
8.003	50.00	5.80	201.175	0.199	0.0	0.0	5.4	1.56	110.6	32.3
8.004	50.00	6.51	200.277	0.212	0.0	0.0	5.7	0.66	46.4	34.4
8.005	50.00	6.83	200.227	0.220	0.0	0.0	6.0	1.01	71.3	35.7
5.004	50.00	6.90	200.197	0.582	0.0	0.0	15.8	2.04	324.0	94.6
9.000	50.00	4.16	200.597	0.023	0.0	0.0	0.6	2.07	82.5	3.7
5.005	50.00	7.16	200.110	0.622	0.0	0.0	16.8	1.20	84.9«	101.1
5.006	50.00	7.72	200.000	0.673	0.0	0.0	18.2	1.20	85.0«	109.4
5.007	50.00	8.49	199.763	0.735	0.0	0.0	19.9	1.21	85.5«	119.4
5.008	50.00	9.11	199.430	0.745	0.0	0.0	20.2	0.78	55.2«	121.1
5.009	50.00	9.29	199.357	0.745	0.0	0.0	20.2	1.21	85.5«	121.1
10.000	50.00	4.32	205.373	0.063	0.0	0.0	1.7	1.68	66.7	10.2
10.001	50.00	4.69	204.839	0.125	0.0	0.0	3.4	1.68	66.7	20.3
10.002	50.00	5.33	204.242	0.188	0.0	0.0	5.1	1.68	66.7	30.5
10.003	50.00	5.87	203.178	0.268	0.0	0.0	7.3	2.02	142.5	43.5
10.004	50.00	6.17	202.105	0.298	0.0	0.0	8.1	2.02	142.5	48.4
11.000	50.00	4.28	203.196	0.041	0.0	0.0	1.1	1.69	67.3	6.7
11.001	50.00	4.46	202.714	0.064	0.0	0.0	1.7	2.03	143.7	10.4

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
12.000	13.582	0.110	123.0	0.029	4.00	0.0	0.600	o	300	Pipe/Conduit	
11.002	56.454	0.656	86.0	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.005	9.046	0.156	58.0	0.009	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.006	11.049	0.037	296.0	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.007	18.213	0.040	455.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.008	5.932	0.015	395.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.010	2.034	0.012	169.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.000	50.00	4.16	202.280	0.029	0.0	0.0	0.8	1.42	100.1	4.7
11.002	50.00	5.02	202.172	0.173	0.0	0.0	4.7	1.70	119.9	28.1
10.005	50.00	6.22	201.516	0.480	0.0	0.0	13.0	2.67	425.2	78.0
10.006	50.00	6.38	201.359	0.492	0.0	0.0	13.3	1.18	187.1	79.9
10.007	50.00	6.70	201.323	0.492	0.0	0.0	13.3	0.95	150.5	79.9
10.008	50.00	6.80	201.283	0.492	0.0	0.0	13.3	1.02	161.6	79.9
5.010	50.00	9.32	199.281	1.237	0.0	0.0	33.5	1.20	85.2«	201.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	205.916	2.887	Open Manhole	1200	1.000	203.029	225				
2	204.913	2.623	Open Manhole	1200	1.001	202.290	225	1.000	202.291	225	1
3	204.830	2.655	Open Manhole	1200	1.002	202.176	225	1.001	202.175	225	
4	204.935	3.078	Open Manhole	1200	2.000	201.857	225				
4	204.506	2.802	Open Manhole	1200	1.003	201.704	300	1.002	201.705	225	
								2.000	201.704	225	
5	204.763	3.148	Open Manhole	1200	1.004	201.615	300	1.003	201.615	300	
6	204.443	2.900	Open Manhole	1200	1.005	201.543	300	1.004	201.543	300	
7	202.866	1.425	Open Manhole	1200	3.000	201.441	225				
8	204.702	3.267	Open Manhole	1200	4.000	201.435	225				
7	203.923	2.657	Open Manhole	1350	1.006	201.266	450	1.005	201.266	300	
								3.000	201.266	225	
								4.000	201.266	225	
8	202.008	1.659	Open Manhole	1350	1.007	200.353	450	1.006	200.349	450	
9	202.500	2.197	Open Manhole	1350	1.008	200.303	450	1.007	200.303	450	
10	202.160	2.000	Open Manhole	1350	1.009	200.160	225	1.008	200.160	450	
11	202.063	2.083	Open Manhole	225		OUTFALL		1.009	199.980	225	
14	204.672	1.377	Open Manhole	1200	5.000	203.295	225				
15	204.129	1.334	Open Manhole	1200	6.000	202.795	225				
15	203.765	1.416	Open Manhole	1200	5.001	202.355	225	5.000	202.349	225	
								6.000	202.353	225	
16	202.157	1.382	Open Manhole	1200	7.000	200.775	225				
16	202.750	2.258	Open Manhole	1200	5.002	200.492	300	5.001	201.368	225	801
								7.000	200.492	225	
17	202.421	2.025	Open Manhole	1200	5.003	200.396	300	5.002	200.396	300	
20	206.232	1.457	Open Manhole	1200	8.000	204.775	225				
21	206.274	1.770	Open Manhole	1200	8.001	204.504	225	8.000	204.504	225	
22	206.287	1.868	Open Manhole	1200	8.002	204.419	225	8.001	204.419	225	
23	204.878	3.703	Open Manhole	1200	8.003	201.175	300	8.002	203.452	225	2202
24	205.732	5.455	Open Manhole	1200	8.004	200.277	300	8.003	201.057	300	780
25	203.646	3.419	Open Manhole	1200	8.005	200.227	300	8.004	200.227	300	
18	203.100	2.953	Open Manhole	1350	5.004	200.197	450	5.003	200.197	300	
								8.005	200.147	300	
19	202.910	2.313	Open Manhole	1200	9.000	200.597	225				
19	202.132	2.025	Open Manhole	1350	5.005	200.110	300	5.004	200.110	450	
								9.000	200.107	225	
20	201.478	1.478	Open Manhole	1200	5.006	200.000	300	5.005	200.000	300	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
21	201.322	1.559	Open Manhole	1200	5.007	199.763	300	5.006	199.763	300	
22	201.070	1.640	Open Manhole	1200	5.008	199.430	300	5.007	199.430	300	
23	202.200	2.843	Open Manhole	1200	5.009	199.357	300	5.008	199.357	300	
34	206.769	1.396	Open Manhole	1200	10.000	205.373	225				
35	207.579	2.740	Open Manhole	1200	10.001	204.839	225	10.000	204.839	225	
36	207.815	3.573	Open Manhole	1200	10.002	204.242	225	10.001	204.242	225	
37	206.412	3.234	Open Manhole	1200	10.003	203.178	300	10.002	203.179	225	
38	204.238	2.133	Open Manhole	1200	10.004	202.105	300	10.003	202.105	300	
39	206.460	3.264	Open Manhole	1200	11.000	203.196	225				
40	205.199	2.485	Open Manhole	1200	11.001	202.714	300	11.000	202.715	225	
41	203.816	1.536	Open Manhole	1200	12.000	202.280	300				
41	204.253	2.083	Open Manhole	1200	11.002	202.172	300	11.001	202.353	300	181
								12.000	202.170	300	
39	203.055	1.539	Open Manhole	1350	10.005	201.516	450	10.004	201.516	300	
								11.002	201.516	300	
40	202.178	0.819	Open Manhole	1350	10.006	201.359	450	10.005	201.360	450	1
44	201.773	0.451	Open Manhole	450	10.007	201.323	450	10.006	201.322	450	
45	201.733	0.450	Open Manhole	1350	10.008	201.283	450	10.007	201.283	450	
24	201.718	2.437	Open Manhole	1350	5.010	199.281	300	5.009	199.281	300	
								10.008	201.268	450	2137
34	199.769	0.500	Open Manhole	225		OUTFALL		5.010	199.269	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	698080.070	714716.451	698080.070	714716.451	Required	
2	698044.557	714678.915	698044.557	714678.915	Required	
3	698043.844	714673.210	698043.844	714673.210	Required	
4	698046.540	714638.202	698046.540	714638.202	Required	
4	698027.608	714656.146	698027.608	714656.146	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
5	698015.487	714643.236	698015.487	714643.236	Required	
6	698001.146	714643.139	698001.146	714643.139	Required	
7	697942.485	714581.385	697942.485	714581.385	Required	
8	697983.889	714583.174	697983.889	714583.174	Required	
7	697962.941	714602.992	697962.941	714602.992	Required	
8	697899.748	714662.926	697899.748	714662.926	Required	
9	697893.563	714660.829	697893.563	714660.829	Required	
10	697879.813	714673.945	697879.813	714673.945	Required	
11	697861.685	714672.658			No Entry	
14	697996.163	714704.814	697996.163	714704.814	Required	
15	697985.895	714658.473	697985.895	714658.473	Required	
15	697968.262	714675.196	697968.262	714675.196	Required	
16	697916.011	714676.025	697916.011	714676.025	Required	
16	697940.319	714701.665	697940.319	714701.665	Required	
17	697922.802	714718.238	697922.802	714718.238	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
20	698091.402	714733.606	698091.402	714733.606	Required	
21	698065.683	714758.951	698065.683	714758.951	Required	
22	698051.102	714767.693	698051.102	714767.693	Required	
23	697999.973	714713.601	697999.973	714713.601	Required	
24	697991.387	714721.798	697991.387	714721.798	Required	
25	697970.948	714741.094	697970.948	714741.094	Required	
18	697956.981	714754.329	697956.981	714754.329	Required	
19	697974.821	714760.863	697974.821	714760.863	Required	
19	697955.303	714762.830	697955.303	714762.830	Required	
20	697936.869	714766.240	697936.869	714766.240	Required	
21	697941.624	714806.291	697941.624	714806.291	Required	
22	697948.267	714861.957	697948.267	714861.957	Required	
23	697977.205	714858.637	697977.205	714858.637	Required	
34	698107.423	714720.812	698107.423	714720.812	Required	
35	698130.063	714744.219	698130.063	714744.219	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
36	698149.292	714775.177	698149.292	714775.177	Required	
37	698093.747	714808.693	698093.747	714808.693	Required	
38	698037.734	714842.560	698037.734	714842.560	Required	
39	698041.668	714773.308	698041.668	714773.308	Required	
40	698016.979	714788.264	698016.979	714788.264	Required	
41	697994.099	714777.287	697994.099	714777.287	Required	
41	697995.471	714790.799	697995.471	714790.799	Required	
39	698002.078	714846.865	698002.078	714846.865	Required	
40	698001.340	714855.881	698001.340	714855.881	Required	
44	697992.995	714863.123	697992.995	714863.123	Required	
45	697975.104	714866.532	697975.104	714866.532	Required	
24	697978.573	714871.344	697978.573	714871.344	Required	
34	697978.895	714873.352			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	205.916	203.029	2.662	Open Manhole	1200
1.001	o	225	2	204.913	202.290	2.398	Open Manhole	1200
1.002	o	225	3	204.830	202.176	2.429	Open Manhole	1200
2.000	o	225	4	204.935	201.857	2.853	Open Manhole	1200
1.003	o	300	4	204.506	201.704	2.502	Open Manhole	1200
1.004	o	300	5	204.763	201.615	2.848	Open Manhole	1200
1.005	o	300	6	204.443	201.543	2.600	Open Manhole	1200
3.000	o	225	7	202.866	201.441	1.200	Open Manhole	1200
4.000	o	225	8	204.702	201.435	3.042	Open Manhole	1200
1.006	o	450	7	203.923	201.266	2.207	Open Manhole	1350
1.007	o	450	8	202.008	200.353	1.205	Open Manhole	1350
1.008	o	450	9	202.500	200.303	1.747	Open Manhole	1350
1.009	o	225	10	202.160	200.160	1.775	Open Manhole	1350
5.000	o	225	14	204.672	203.295	1.152	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	51.674	70.0	2	204.913	202.291	2.397	Open Manhole	1200
1.001	5.749	50.0	3	204.830	202.175	2.430	Open Manhole	1200
1.002	23.554	50.0	4	204.506	201.705	2.576	Open Manhole	1200
2.000	26.085	170.0	4	204.506	201.704	2.577	Open Manhole	1200
1.003	17.708	199.0	5	204.763	201.615	2.848	Open Manhole	1200
1.004	14.341	199.0	6	204.443	201.543	2.600	Open Manhole	1200
1.005	55.421	200.0	7	203.923	201.266	2.357	Open Manhole	1350
3.000	29.753	170.0	7	203.923	201.266	2.432	Open Manhole	1350
4.000	28.837	171.0	7	203.923	201.266	2.432	Open Manhole	1350
1.006	87.095	95.0	8	202.008	200.349	1.209	Open Manhole	1350
1.007	6.530	131.0	9	202.500	200.303	1.747	Open Manhole	1350
1.008	19.003	133.0	10	202.160	200.160	1.550	Open Manhole	1350
1.009	18.173	101.0	11	202.063	199.980	1.858	Open Manhole	225
5.000	40.690	43.0	15	203.765	202.349	1.191	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.000	o	225	15	204.129	202.795	1.109	Open Manhole	1200
5.001	o	225	15	203.765	202.355	1.185	Open Manhole	1200
7.000	o	225	16	202.157	200.775	1.157	Open Manhole	1200
5.002	o	300	16	202.750	200.492	1.958	Open Manhole	1200
5.003	o	300	17	202.421	200.396	1.725	Open Manhole	1200
8.000	o	225	20	206.232	204.775	1.232	Open Manhole	1200
8.001	o	225	21	206.274	204.504	1.545	Open Manhole	1200
8.002	o	225	22	206.287	204.419	1.643	Open Manhole	1200
8.003	o	300	23	204.878	201.175	3.403	Open Manhole	1200
8.004	o	300	24	205.732	200.277	5.155	Open Manhole	1200
8.005	o	300	25	203.646	200.227	3.119	Open Manhole	1200
5.004	o	450	18	203.100	200.197	2.453	Open Manhole	1350
9.000	o	225	19	202.910	200.597	2.088	Open Manhole	1200
5.005	o	300	19	202.132	200.110	1.722	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
6.000	24.302	55.0	15	203.765	202.353	1.187	Open Manhole	1200
5.001	38.489	39.0	16	202.750	201.368	1.157	Open Manhole	1200
7.000	35.332	124.8	16	202.750	200.492	2.033	Open Manhole	1200
5.002	24.115	251.2	17	202.421	200.396	1.725	Open Manhole	1200
5.003	49.707	250.0	18	203.100	200.197	2.603	Open Manhole	1350
8.000	36.108	133.0	21	206.274	204.504	1.545	Open Manhole	1200
8.001	17.001	200.0	22	206.287	204.419	1.643	Open Manhole	1200
8.002	74.433	77.0	23	204.878	203.452	1.201	Open Manhole	1200
8.003	11.871	101.0	24	205.732	201.057	4.375	Open Manhole	1200
8.004	28.108	562.2	25	203.646	200.227	3.119	Open Manhole	1200
8.005	19.242	240.5	18	203.100	200.147	2.653	Open Manhole	1350
5.004	8.665	99.6	19	202.132	200.110	1.572	Open Manhole	1350
9.000	19.616	40.0	19	202.132	200.107	1.800	Open Manhole	1350
5.005	18.746	170.4	20	201.478	200.000	1.178	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	o	300	20	201.478	200.000	1.178	Open Manhole	1200
5.007	o	300	21	201.322	199.763	1.259	Open Manhole	1200
5.008	o	300	22	201.070	199.430	1.340	Open Manhole	1200
5.009	o	300	23	202.200	199.357	2.543	Open Manhole	1200
10.000	o	225	34	206.769	205.373	1.171	Open Manhole	1200
10.001	o	225	35	207.579	204.839	2.515	Open Manhole	1200
10.002	o	225	36	207.815	204.242	3.348	Open Manhole	1200
10.003	o	300	37	206.412	203.178	2.934	Open Manhole	1200
10.004	o	300	38	204.238	202.105	1.833	Open Manhole	1200
11.000	o	225	39	206.460	203.196	3.039	Open Manhole	1200
11.001	o	300	40	205.199	202.714	2.185	Open Manhole	1200
12.000	o	300	41	203.816	202.280	1.236	Open Manhole	1200
11.002	o	300	41	204.253	202.172	1.781	Open Manhole	1200
10.005	o	450	39	203.055	201.516	1.089	Open Manhole	1350
10.006	o	450	40	202.178	201.359	0.369	Open Manhole	1350
10.007	o	450	44	201.773	201.323	0.000	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	40.332	170.2	21	201.322	199.763	1.259	Open Manhole	1200
5.007	56.061	168.4	22	201.070	199.430	1.340	Open Manhole	1200
5.008	29.128	399.0	23	202.200	199.357	2.543	Open Manhole	1200
5.009	12.780	168.2	24	201.718	199.281	2.137	Open Manhole	1350
10.000	32.565	61.0	35	207.579	204.839	2.515	Open Manhole	1200
10.001	36.443	61.0	36	207.815	204.242	3.348	Open Manhole	1200
10.002	64.873	61.0	37	206.412	203.179	3.008	Open Manhole	1200
10.003	65.456	61.0	38	204.238	202.105	1.833	Open Manhole	1200
10.004	35.915	61.0	39	203.055	201.516	1.239	Open Manhole	1350
11.000	28.866	60.0	40	205.199	202.715	2.259	Open Manhole	1200
11.001	21.657	60.0	41	204.253	202.353	1.600	Open Manhole	1200
12.000	13.582	123.0	41	204.253	202.170	1.783	Open Manhole	1200
11.002	56.454	86.0	39	203.055	201.516	1.239	Open Manhole	1350
10.005	9.046	58.0	40	202.178	201.360	0.368	Open Manhole	1350
10.006	11.049	296.0	44	201.773	201.322	0.001	Open Manhole	450
10.007	18.213	455.3	45	201.733	201.283	0.000	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.008	o	450	45	201.733	201.283	0.000	Open Manhole	1350
5.010	o	300	24	201.718	199.281	2.137	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.008	5.932	395.5	24	201.718	201.268	0.000	Open Manhole	1350
5.010	2.034	169.5	34	199.769	199.269	0.200	Open Manhole	225

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	11	202.063	199.980	199.980	225	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
5.010	34	199.769	199.269	199.269	225	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	1200
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	10

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model FSR Return Period (years) 100

Synthetic Rainfall Details

Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840
Ratio R	0.233	Storm Duration (mins)	600
Profile Type	Summer		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 10, DS/PN: 1.009, Volume (m³): 5.7

Unit Reference	MD-SHE-0105-6000-1675-6000
Design Head (m)	1.675
Design Flow (l/s)	6.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	105
Invert Level (m)	200.160
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.675	6.0
Flush-Flo™	0.458	5.8
Kick-Flo®	0.939	4.6
Mean Flow over Head Range	-	5.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.5	1.200	5.1	3.000	7.9	7.000	11.8
0.200	5.2	1.400	5.5	3.500	8.5	7.500	12.2
0.300	5.6	1.600	5.9	4.000	9.0	8.000	12.6
0.400	5.8	1.800	6.2	4.500	9.5	8.500	12.9
0.500	5.8	2.000	6.5	5.000	10.0	9.000	13.3
0.600	5.7	2.200	6.8	5.500	10.5	9.500	13.6
0.800	5.3	2.400	7.1	6.000	10.9		
1.000	4.7	2.600	7.4	6.500	11.4		

Hydro-Brake® Optimum Manhole: 18, DS/PN: 5.004, Volume (m³): 8.8

Unit Reference	MD-SHE-0084-4000-1755-4000
Design Head (m)	1.755
Design Flow (l/s)	4.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	84
Invert Level (m)	200.197
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Hydro-Brake® Optimum Manhole: 18, DS/PN: 5.004, Volume (m³): 8.8

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.755	4.0
Flush-Flo™	0.369	3.4
Kick-Flo®	0.751	2.7
Mean Flow over Head Range	-	3.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.4	3.000	5.1	7.000	7.6
0.200	3.2	1.400	3.6	3.500	5.5	7.500	7.9
0.300	3.3	1.600	3.8	4.000	5.9	8.000	8.1
0.400	3.4	1.800	4.0	4.500	6.2	8.500	8.4
0.500	3.3	2.000	4.2	5.000	6.5	9.000	8.6
0.600	3.2	2.200	4.4	5.500	6.8	9.500	8.8
0.800	2.8	2.400	4.6	6.000	7.1		
1.000	3.1	2.600	4.8	6.500	7.4		

Hydro-Brake® Optimum Manhole: 24, DS/PN: 5.010, Volume (m³): 5.0

Unit Reference	MD-SHE-0118-9000-2449-9000
Design Head (m)	2.449
Design Flow (l/s)	9.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	118
Invert Level (m)	199.281
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.449	9.0
Flush-Flo™	0.517	7.7
Kick-Flo®	1.058	6.1
Mean Flow over Head Range	-	7.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.300	7.3	0.500	7.7	0.800	7.3
0.200	6.6	0.400	7.6	0.600	7.6	1.000	6.5

Hydro-Brake® Optimum Manhole: 24, DS/PN: 5.010, Volume (m³): 5.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	6.4	2.400	8.9	5.000	12.6	8.000	15.8
1.400	6.9	2.600	9.2	5.500	13.2	8.500	16.2
1.600	7.4	3.000	9.9	6.000	13.8	9.000	16.7
1.800	7.8	3.500	10.6	6.500	14.3	9.500	17.1
2.000	8.2	4.000	11.3	7.000	14.8		
2.200	8.5	4.500	12.0	7.500	15.3		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.009

Invert Level (m) 200.160 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01889 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.01889

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	342.4	342.4	1.676	0.0	342.4
1.675	342.4	342.4			

Cellular Storage Manhole: 25, DS/PN: 8.005

Invert Level (m) 200.227 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.06174 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.06174

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	236.3	236.3	1.676	0.0	236.3
1.675	236.3	236.3			

Complex Manhole: 24, DS/PN: 5.010

Cellular Storage

Invert Level (m) 199.281 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	369.5	369.5	1.676	0.0	369.5
1.675	369.5	369.5			

Infiltration Basin

Invert Level (m) 199.281 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	120.9	0.407	187.6	0.441	219.9

Summary of Results for 600 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	203.084	-0.170	0.000	0.14			8.3	OK
1.001	2	202.356	-0.159	0.000	0.19			9.0	OK
1.002	3	202.239	-0.162	0.000	0.17			11.7	OK
2.000	4	201.906	-0.176	0.000	0.11			4.0	OK
1.003	4	201.809	-0.195	0.000	0.27			18.1	OK
1.004	5	201.728	-0.187	0.000	0.31			20.0	OK
1.005	6	201.667	-0.176	0.000	0.36			26.6	OK
3.000	7	201.593	-0.073	0.000	0.13			4.7	OK
4.000	8	201.593	-0.067	0.000	0.19			7.2	OK
1.006	7	201.591	-0.125	0.000	0.17			53.2	OK
1.007	8	201.587	0.784	0.000	0.30			51.1	SURCHARGED
1.008	9	201.586	0.833	0.000	0.25			54.1	SURCHARGED
1.009	10	201.584	1.199	0.000	0.12		630	5.7	SURCHARGED
5.000	14	203.334	-0.186	0.000	0.07			5.3	OK
6.000	15	202.828	-0.192	0.000	0.05			3.5	OK
5.001	15	202.416	-0.164	0.000	0.17			13.2	OK
7.000	16	201.783	0.783	0.000	0.06			2.7	SURCHARGED
5.002	16	201.562	0.770	0.000	0.34			21.0	SURCHARGED
5.003	17	201.373	0.677	0.000	0.38			25.0	SURCHARGED
8.000	20	204.828	-0.172	0.000	0.13			5.4	OK
8.001	21	204.578	-0.151	0.000	0.24			7.7	OK
8.002	22	204.495	-0.149	0.000	0.25			14.5	OK
8.003	23	201.531	0.056	0.000	0.17			15.0	SURCHARGED
8.004	24	201.528	0.951	0.000	0.37			15.7	SURCHARGED
8.005	25	201.524	0.997	0.000	0.12		420	7.5	SURCHARGED
5.004	18	201.668	1.021	0.000	0.02			3.8	SURCHARGED
9.000	19	200.620	-0.202	0.000	0.02			1.7	OK
5.005	19	200.171	-0.239	0.000	0.09			6.5	OK
5.006	20	200.116	-0.184	0.000	0.13			10.3	OK
5.007	21	200.110	0.047	0.000	0.18			14.9	SURCHARGED
5.008	22	200.102	0.372	0.000	0.29			14.5	SURCHARGED
5.009	23	200.097	0.440	0.000	0.21			14.4	SURCHARGED
10.000	34	205.414	-0.184	0.000	0.08			4.7	OK
10.001	35	204.897	-0.167	0.000	0.15			9.4	OK
10.002	36	204.313	-0.154	0.000	0.22			14.2	OK
10.003	37	203.255	-0.223	0.000	0.15			20.2	OK
10.004	38	202.188	-0.217	0.000	0.17			22.4	OK
11.000	39	203.228	-0.193	0.000	0.05			3.1	OK
11.001	40	202.752	-0.262	0.000	0.04			4.8	OK
12.000	41	202.312	-0.268	0.000	0.03			2.2	OK
11.002	41	202.239	-0.233	0.000	0.11			13.0	OK
10.005	39	201.637	-0.329	0.000	0.16			36.1	OK

Summary of Results for 600 minute 100 year Summer (Storm)

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
10.006	40	201.538	-0.271	0.000	0.28			37.1	OK
10.007	44	201.513	-0.260	0.000	0.35			37.1	FLOOD RISK
10.008	45	201.461	-0.272	0.000	0.33			37.1	FLOOD RISK
5.010	24	200.093	0.512	0.000	0.14			7.7	SURCHARGED

Appendix D : Foul Drainage Network Model

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Unit

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Calculation Method	EN 752	Maximum Backdrop Height (m)	1.500
Frequency Factor	0.50	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	41.954	0.699	60.0	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F2.000	32.329	0.539	60.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F1.001	67.845	1.696	40.0	0.000	350.0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	31.716	0.529	60.0	0.000	112.0	0.0	1.500	o	150	Pipe/Conduit	
F1.002	16.694	0.083	201.1	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F1.003	55.516	0.278	199.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F4.000	51.810	0.880	58.9	0.000	280.0	0.0	1.500	o	225	Pipe/Conduit	
F4.001	5.663	0.190	29.8	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F4.002	20.099	0.447	45.0	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	202.900	0.000	0.0	28.0	0.0	33	0.74	1.48	59.0	2.6
F2.000	202.957	0.000	0.0	70.0	0.0	41	0.85	1.48	59.0	4.2
F1.001	202.200	0.000	0.0	448.0	0.0	58	1.30	1.82	72.3	10.6
F3.000	200.795	0.000	0.0	112.0	0.0	53	0.95	1.13	20.0	5.3
F1.002	200.278	0.000	0.0	574.0	0.0	95	0.75	0.81	32.1	12.0
F1.003	200.177	0.000	0.0	574.0	0.0	95	0.75	0.81	32.2	12.0
F4.000	204.525	0.000	0.0	280.0	0.0	57	1.06	1.50	59.5	8.4
F4.001	203.645	0.000	0.0	294.0	0.0	49	1.36	2.11	83.8	8.6
F4.002	203.455	0.000	0.0	350.0	0.0	56	1.20	1.71	68.2	9.4

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F5.000	26.519	0.577	46.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F4.003	18.635	0.093	200.4	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F4.004	12.463	0.062	200.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F4.005	47.465	0.913	52.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F6.000	57.153	0.762	75.0	0.000	154.0	0.0	1.500	o	225	Pipe/Conduit	
F6.001	7.405	0.185	40.0	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F6.002	37.672	0.942	40.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F4.006	38.542	1.148	33.6	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F1.004	23.508	0.117	200.9	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F7.000	25.812	0.478	54.0	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	44.046	0.225	195.8	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	46.118	1.153	40.0	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	12.444	0.091	136.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F5.000	203.575	0.000	0.0	70.0	0.0	38	0.94	1.69	67.4	4.2
F4.003	203.005	0.000	0.0	462.0	0.0	89	0.73	0.81	32.2	10.7
F4.004	202.912	0.000	0.0	476.0	0.0	90	0.73	0.81	32.2	10.9
F4.005	202.849	0.000	0.0	546.0	0.0	66	1.22	1.59	63.4	11.7
F6.000	204.186	0.000	0.0	154.0	0.0	52	0.89	1.33	52.7	6.2
F6.001	203.422	0.000	0.0	182.0	0.0	46	1.14	1.82	72.3	6.7
F6.002	202.871	0.000	0.0	266.0	0.0	51	1.20	1.82	72.3	8.2
F4.006	201.047	0.000	0.0	980.0	0.0	68	1.55	1.98	78.9	15.7
F1.004	199.899	0.000	0.0	1568.0	0.0	128	0.85	0.81	32.1	19.8
F7.000	200.456	0.000	0.0	112.0	0.0	45	0.95	1.56	62.2	5.3
F1.005	199.782	0.000	0.0	1820.0	0.0	133	0.87	0.82	32.6	21.3
F8.000	201.915	0.000	0.0	56.0	0.0	35	0.95	1.82	72.3	3.7
F1.006	199.557	0.000	0.0	1876.0	0.0	120	1.01	0.98	39.0	21.7

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F9.000	29.242	0.487	60.0	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F9.001	60.069	0.400	150.2	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	
F9.002	22.667	0.283	80.1	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	35.296	0.588	60.0	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F10.001	32.687	0.218	150.0	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F10.002	75.362	0.723	104.2	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F10.003	51.962	0.962	54.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F10.004	37.533	0.938	40.0	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F10.005	55.897	0.318	176.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F9.003	19.979	0.149	134.1	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F9.004	13.498	0.180	75.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F9.005	36.134	0.871	41.5	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	11.198	0.280	40.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F11.000	50.172	0.233	215.3	0.000	42.0	0.0	1.500	o	300	Pipe/Conduit	
F11.001	33.195	0.154	215.6	0.000	56.0	0.0	1.500	o	300	Pipe/Conduit	
F11.002	63.487	0.294	215.9	0.000	112.0	0.0	1.500	o	300	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F9.000	204.835	0.000	0.0	112.0	0.0	46	0.92	1.48	59.0	5.3
F9.001	204.000	0.000	0.0	294.0	0.0	73	0.76	0.94	37.2	8.6
F9.002	201.638	0.000	0.0	350.0	0.0	65	0.98	1.28	51.0	9.4
F10.000	205.445	0.000	0.0	126.0	0.0	47	0.93	1.48	59.0	5.6
F10.001	204.856	0.000	0.0	294.0	0.0	73	0.76	0.94	37.2	8.6
F10.002	204.638	0.000	0.0	406.0	0.0	73	0.91	1.12	44.7	10.1
F10.003	203.915	0.000	0.0	546.0	0.0	66	1.20	1.56	62.2	11.7
F10.004	201.945	0.000	0.0	602.0	0.0	63	1.35	1.82	72.3	12.3
F10.005	201.007	0.000	0.0	742.0	0.0	98	0.81	0.86	34.4	13.6
F9.003	200.689	0.000	0.0	1120.0	0.0	102	0.95	0.99	39.4	16.7
F9.004	200.517	0.000	0.0	1120.0	0.0	87	1.18	1.33	52.7	16.7
F9.005	200.337	0.000	0.0	1148.0	0.0	75	1.47	1.79	71.0	16.9
F1.007	198.744	0.000	0.0	3038.0	0.0	96	1.70	1.82	72.3	27.6
F11.000	198.148	0.000	0.0	42.0	0.0	45	0.49	0.94	66.7	3.2
F11.001	197.915	0.000	0.0	98.0	0.0	55	0.55	0.94	66.7	4.9
F11.002	197.761	0.000	0.0	210.0	0.0	67	0.62	0.94	66.6	7.2

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.008	20.054	0.094	213.3	0.000	0.0	0.0	1.500	o	300	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.008	197.467	0.000	0.0	3248.0	0.0	136	0.91	0.95	67.0	28.5

PIPELINE SCHEDULES for Foul - Unit

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	o	225	F2	204.388	202.900	1.263	Open Manhole	1200
F2.000	o	225	F2	204.718	202.957	1.536	Open Manhole	1200
F1.001	o	225	F2	203.844	202.200	1.419	Open Manhole	1200
F3.000	o	150	F4	201.495	200.795	0.550	Open Manhole	1200
F1.002	o	225	F3	202.468	200.278	1.965	Open Manhole	1200
F1.003	o	225	F3	201.991	200.177	1.589	Open Manhole	1200
F4.000	o	225	F5	205.898	204.525	1.148	Open Manhole	1200
F4.001	o	225	F6	204.952	203.645	1.082	Open Manhole	1200
F4.002	o	225	F7	201.839	203.455	-1.841	Open Manhole	1200
F5.000	o	225	F8	204.937	203.575	1.137	Open Manhole	1200
F4.003	o	225	F8	204.497	203.005	1.267	Open Manhole	1200
F4.004	o	225	F9	204.716	202.912	1.579	Open Manhole	1200
F4.005	o	225	F10	204.481	202.849	1.407	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	41.954	60.0	F2	203.844	202.201	1.418	Open Manhole	1200
F2.000	32.329	60.0	F2	203.844	202.418	1.201	Open Manhole	1200
F1.001	67.845	40.0	F3	202.468	200.504	1.739	Open Manhole	1200
F3.000	31.716	60.0	F3	202.468	200.266	2.052	Open Manhole	1200
F1.002	16.694	201.1	F3	201.991	200.195	1.571	Open Manhole	1200
F1.003	55.516	199.7	F4	202.782	199.899	2.658	Open Manhole	1200
F4.000	51.810	58.9	F6	204.952	203.645	1.082	Open Manhole	1200
F4.001	5.663	29.8	F7	201.839	203.455	-1.841	Open Manhole	1200
F4.002	20.099	45.0	F8	204.497	203.008	1.264	Open Manhole	1200
F5.000	26.519	46.0	F8	204.497	202.999	1.274	Open Manhole	1200
F4.003	18.635	200.4	F9	204.716	202.912	1.579	Open Manhole	1200
F4.004	12.463	200.0	F10	204.481	202.850	1.406	Open Manhole	1200
F4.005	47.465	52.0	F11	203.751	201.936	1.590	Open Manhole	1200

PIPELINE SCHEDULES for Foul - Unit

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F6.000	o	225	F11	206.193	204.186	1.782	Open Manhole	1200
F6.001	o	225	F12	204.847	203.422	1.200	Open Manhole	1200
F6.002	o	225	F13	204.681	202.871	1.585	Open Manhole	1200
F4.006	o	225	F11	203.751	201.047	2.479	Open Manhole	1200
F1.004	o	225	F4	202.782	199.899	2.658	Open Manhole	1200
F7.000	o	225	F6	202.172	200.456	1.491	Open Manhole	1200
F1.005	o	225	F5	202.237	199.782	2.230	Open Manhole	1200
F8.000	o	225	F8	204.278	201.915	2.138	Open Manhole	1200
F1.006	o	225	F6	202.183	199.557	2.401	Open Manhole	1200
F9.000	o	225	F20	206.207	204.835	1.147	Open Manhole	1200
F9.001	o	225	F21	206.273	204.000	2.048	Open Manhole	1200
F9.002	o	225	F22	205.184	201.638	3.321	Open Manhole	1200
F10.000	o	225	F23	206.733	205.445	1.063	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F6.000	57.153	75.0	F12	204.847	203.424	1.198	Open Manhole	1200
F6.001	7.405	40.0	F13	204.681	203.237	1.219	Open Manhole	1200
F6.002	37.672	40.0	F11	203.751	201.929	1.597	Open Manhole	1200
F4.006	38.542	33.6	F4	202.782	199.899	2.658	Open Manhole	1200
F1.004	23.508	200.9	F5	202.237	199.782	2.230	Open Manhole	1200
F7.000	25.812	54.0	F5	202.237	199.978	2.034	Open Manhole	1200
F1.005	44.046	195.8	F6	202.183	199.557	2.401	Open Manhole	1200
F8.000	46.118	40.0	F6	202.183	200.762	1.196	Open Manhole	1200
F1.006	12.444	136.7	F7	201.773	199.466	2.082	Open Manhole	1200
F9.000	29.242	60.0	F21	206.273	204.348	1.700	Open Manhole	1200
F9.001	60.069	150.2	F22	205.184	203.600	1.359	Open Manhole	1200
F9.002	22.667	80.1	F23	204.118	201.355	2.538	Open Manhole	1200
F10.000	35.296	60.0	F24	207.608	204.857	2.526	Open Manhole	1200

PIPELINE SCHEDULES for Foul - Unit

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F10.001	o	225	F24	207.608	204.856	2.527	Open Manhole	1200
F10.002	o	225	F25	207.630	204.638	2.767	Open Manhole	1200
F10.003	o	225	F26	205.980	203.915	1.840	Open Manhole	1200
F10.004	o	225	F27	204.229	201.945	2.059	Open Manhole	1200
F10.005	o	225	F28	203.150	201.007	1.918	Open Manhole	1200
F9.003	o	225	F23	204.118	200.689	3.204	Open Manhole	1200
F9.004	o	225	F24	203.483	200.517	2.741	Open Manhole	1200
F9.005	o	225	F25	203.032	200.337	2.470	Open Manhole	1200
F1.007	o	225	F7	201.773	198.744	2.804	Open Manhole	1200
F11.000	o	300	F33	202.641	198.148	4.193	Open Manhole	1200
F11.001	o	300	F34	201.249	197.915	3.034	Open Manhole	1200
F11.002	o	300	F35	201.333	197.761	3.272	Open Manhole	1200
F1.008	o	300	F8	201.458	197.467	3.691	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F10.001	32.687	150.0	F25	207.630	204.638	2.767	Open Manhole	1200
F10.002	75.362	104.2	F26	205.980	203.915	1.840	Open Manhole	1200
F10.003	51.962	54.0	F27	204.229	202.953	1.051	Open Manhole	1200
F10.004	37.533	40.0	F28	203.150	201.007	1.918	Open Manhole	1200
F10.005	55.897	176.0	F23	204.118	200.689	3.204	Open Manhole	1200
F9.003	19.979	134.1	F24	203.483	200.540	2.718	Open Manhole	1200
F9.004	13.498	75.0	F25	203.032	200.337	2.470	Open Manhole	1200
F9.005	36.134	41.5	F7	201.773	199.466	2.082	Open Manhole	1200
F1.007	11.198	40.0	F8	201.458	198.464	2.769	Open Manhole	1200
F11.000	50.172	215.3	F34	201.249	197.915	3.034	Open Manhole	1200
F11.001	33.195	215.6	F35	201.333	197.761	3.272	Open Manhole	1200
F11.002	63.487	215.9	F8	201.458	197.467	3.691	Open Manhole	1200
F1.008	20.054	213.3	F	201.090	197.373	3.417	Open Manhole	300

Free Flowing Outfall Details for Foul - Unit

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.008	F	201.090	197.373	0.000	300	0

Simulation Criteria for Foul - Unit

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	1200
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	10

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.300	Storm Duration (mins)	600
Ratio R	0.233		

Appendix E : Irish Water Correspondence

CONFIRMATION OF FEASIBILITY

Sean Byrne

Ormond House
Upper Ormond Quay
Dublin 7
Dublin
D07 W704

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

24 January 2024

Our Ref: CDS23008951 Pre-Connection Enquiry
Blessington Demesne, Oak Drive, Blessington, Wicklow

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 222 unit(s) at Blessington Demesne, Oak Drive, Blessington, Wicklow, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

• **Water Connection**	- Feasible Subject to upgrades - To connect this development to the UE water network significant upgrades are required. These include the upsizing of approx. 300m of existing 150mm watermain to 250mm. The applicant will be responsible for the full cost of these upgrades.
• **Wastewater Connection**	- Feasible without infrastructure upgrade by Irish Water - Presently there is capacity in the network to cater for your development but it is limited, a full review of the proposed connection is required at application stage.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

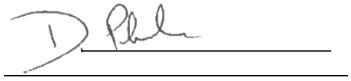
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

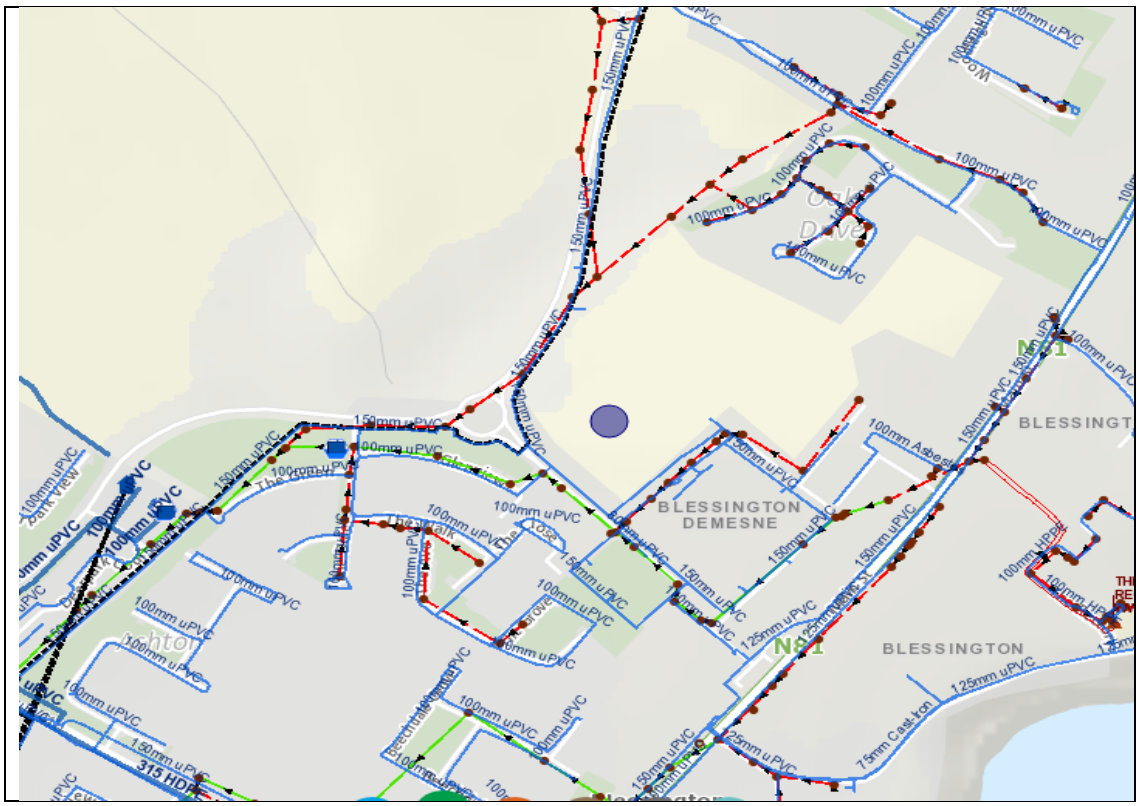
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie



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Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Sean Byrne
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www.water.ie

9 October 2024

Re: Design Submission for Blessington Demesne, Oak Drive, Blessington, Wicklow (the "Development")
(the "Design Submission") / Connection Reference No: CDS23008951

Dear Sean Byrne,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Antonio Garzón Mielgo
Email: antonio.garzonmielgo@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- X-05-Z00-DTM-DR-DBFL-CE-1301 Site Services Layout
- X-05-Z00-DTM-DR-DBFL-CE-1331 Watermain Layout
- X-92-Z00-DTM-DR-DBFL-CE-3321 Foul Longitudinal Sections Sheet 1
- X-92-Z00-DTM-DR-DBFL-CE-3322 Foul Longitudinal Sections Sheet 2

Additional Comments

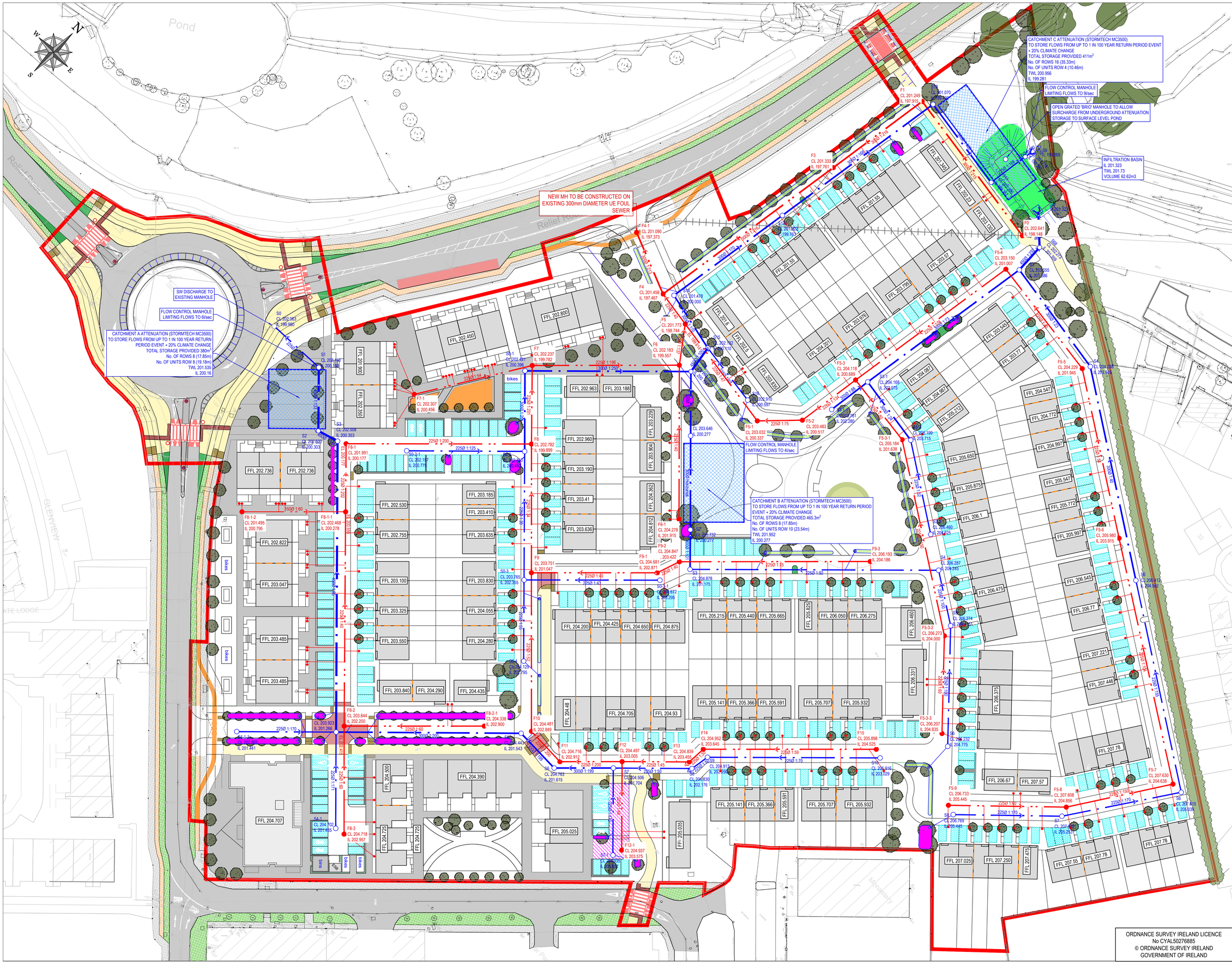
The design submission will be subject to further technical review at connection application stage.

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

Please note there is an existing Uisce Éireann infrastructure within the proposed development site. Should any development activities be proposed in the vicinity of this existing infrastructure, you will be required to enter into a diversion agreement with Uisce Éireann, prior to the commencement of any development activity. This Statement of Design Acceptance does not extend to proposed diversion of existing on-site water assets. Please engage with our diversions team on this matter via diversions@water.ie.

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.



ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES:

GENERAL NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
2. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS AND LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE.
3. ALL DIMENSIONS AND LEVELS ARE IN METERS AND ARE RELATED TO ORDINANCE DATUM. CO-ORDINATES RELATE TO ITM.
4. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
5. ALL FOUL SEWER HOUSE CONNECTIONS TO BE MIN 100mmØ UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2 IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
6. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225mm DIAMETER CLASS H CONCRETE TO IS EN 1916 & IS 6 2004 OR UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2, MIN. JETTING RESISTANCE OF 180 BAR IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
7. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
8. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150mmØ UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
9. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
10. ALL COVER LEVELS TO MATCH FINISHED ROAD/VERGE/FOOTPATH/CYCLETRACK LEVELS UNLESS OTHERWISE STATED.
11. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME
12. ALL FOUL SEWERS TO BE AIR TESTED IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
13. WHERE COVERS ARE LOCATED IN GRASS AREAS THEY SHALL BE SURROUNDED BY A CONCRETE PLINTH, 200MM ALL ROUND AND 100MM DEEP FORMED WITH C20/25 CONCRETE, 20MM AGGREGATE SIZE. BEDDED IN CLAUSE 808 MATERIAL.
14. CONTRACTOR TO ENSURE GULLIES ARE PROVIDED AT LOW POINTS.
15. FILTER TRENCH TO BE AS PER DBFL DRAWING XXX
16. CONTRACTOR TO REVIEW DRAINAGE LONG SECTIONS FOR IL'S, ELS ETC.

LEGEND:

- SITE BOUNDARY
- PROPOSED ROAD
- PROPOSED FOOTHPATH / CENTRAL RESERVE
- PROPOSED VERGE/LANDSCAPE AREAS
- PROPOSED HOMEZONE ROAD
- PROPOSED PARKING AREAS
- PROPOSED BIO-RETENTION AREAS
- PROPOSED RAIN GARDEN
- PROPOSED TREE PIT AREAS
- PROPOSED SERVICES FOR DECOMISSION
- PERMEABLE PAVING (PRIVATE)
- 99.99 ROAD LEVEL
- FFL 99.999 FINISHED FLOOR LEVEL
- SURFACE WATER SEWER
- SURFACE WATER BRIO MANHOLE
- FOUL WATER SEWER
- EXISTING WATERMAIN
- EXISTING SW SEWER
- EXISTING FOUL SEWER
- FOUL INSPECTION CHAMBER SURFACE WATER AJ

rev	date	description	by	chkd.
0	15-04-24	Planning	HvH	PJC

STATUS CODES

purpose	acceptance
P1 - INFORMATION	S - ISSUED

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project ref.
BLESSINGTON LRD

drawing title
SITE SERVICES LAYOUT

client
MARSHALL YARDS DEVELOPMENT COMPANY LTD'

designed by	author	scale	sheet size
XXX	HvH	VALUE	A1

drawing no. 230199-X-05-Z00-DTM-DR-DBFL-CE-1301 | revision 0

ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES:

GENERAL NOTES:

1. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE WORKS REQUIREMENTS.
2. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. ALL LEVELS ARE TO ORDNANCE DATUM (MALIN HEAD).
5. ALL TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT SHALL COMPLY FULLY WITH THE WORKS REQUIREMENTS.
6. THE CONTRACTOR MUST LIAISE DIRECTLY WITH LOCAL AUTHORITY DEPARTMENTS AS DIRECTED IN THE WORKS REQUIREMENTS.
7. ALL VEHICULAR & PEDESTRIAN, CYCLE & PRIVATE ACCESS ROUTES WITHIN AND SURROUNDING THE WORKS EXTENTS MUST BE MAINTAINED THROUGHOUT THE WORKS IN ACCORDANCE WITH THE CONTRACTORS APPROVED TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT PLAN.

DRAWING SPECIFIC NOTES

1. WATERMAIN INSTALLATION AND ALL WATER SUPPLY WORKS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER'S CODE OF PRACTICE FOR WATER SUPPLY AND WATER INFRASTRUCTURE STANDARD DETAILS
2. WATERMAINS (AND SERVICE CONNECTIONS) TO BE PE-100 SDR-17 AND SHALL CONFORM TO IS EN 12201 (PART 1, PART 2 & PART 3).
3. AT 90 DEG. TURNS USE 2 No. 45 DEG. BENDS.
4. COVER TO WATERMAIN TO BE 900mm.
5. CONNECTION BETWEEN EXISTING AND PROPOSED WATERMAINS TO BE CARRIED OUT IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS STD-W-03 TO STD-W-10.
6. ANCHOR BLOCKS TO BE POSITIONED AT DEAD ENDS, TEES, BENDS AND AT EACH SIDE OF HYDRANTS AND VALVES IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER STANDARD DETAIL STD-W-28 (WATER MAIN THRUST AND SUPPORT BLOCKS.
7. HYDRANT OUTLET TO BE 200mm BELOW GROUND LEVEL UNLESS REQUESTED OTHERWISE.
8. WHERE COVER TO PIPE IS LESS THAN 900mm IN GREEN AREAS AND 1200mm IN TRAFFICKED AREAS, ENCASE PIPE IN NEW 150mm CONCRETE WITH MOVEMENT JOINTS.
9. NOTE THAT THE CONTRACTOR IS RESPONSIBLE FOR CONNECTIONS INTO THE BUILDING.
10. CONNECTION TO INDIVIDUAL HOUSES IN ACCORDANCE WITH IRISH WATER STD-W-03.
11. CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE ACCORACY OF EXISTING SERVICES INFORMATION AND THE LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCING INSTALLATION OF WATERMAINS.
12. INSTALLATION OF SLUICE VALVES AND HYDRANTS SHALL BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS STD-W-14 TO STD-W-19.
13. MARKER POSTS AND PLATES ARE TO BE PROVIDED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-W-27.
14. CONNECTION TO EXISTING WATERMAINS TO BE COORDINATED BY THE CONTRACTOR WITH IRISH WATER AND/OR THE LOCAL AUTHORITY.
15. CONTRACTOR TO LIASE WITH IRISH WATER AND / OR THE LOCAL AUTHORITY AS REQUIRED REGARDING CLEANSING AND STERILISATION OF WATERMAINS

LEGEND:

- SITE BOUNDARY
- PROPOSED HOMEZONE ROAD
- PROPOSED PARKING AREAS
- PROPOSED BIO-RETENTION AREAS
- PROPOSED SERVICES FOR DECOMMISSION
- PROPOSED BUILDING STEP
- PROPOSED 125mm PE WATER MAIN
- PROPOSED 180mm PE WATER MAIN
- PROPOSED SLUICE VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SCOUR CHAMBER
- PROPOSED METER KIOSK
- PROPOSED WATER MAIN METER
- PROPOSED BOUNDARY BOX AND TIE-IN
- FFL 207.773 PROPOSED FINISHED FLOOR LEVEL

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project ref.
BLESSINGTON LRD

drawing title
WATERMAIN LAYOUT

client
MARSHALL YARDS DEVELOPMENT COMPANY LTD'

designed by	author	scale	sheet size
XXX	HvH	VALUE	A1

drawing no. 230199-X-05-Z00-DTM-DR-DBFL-CE-1331 | revision 0

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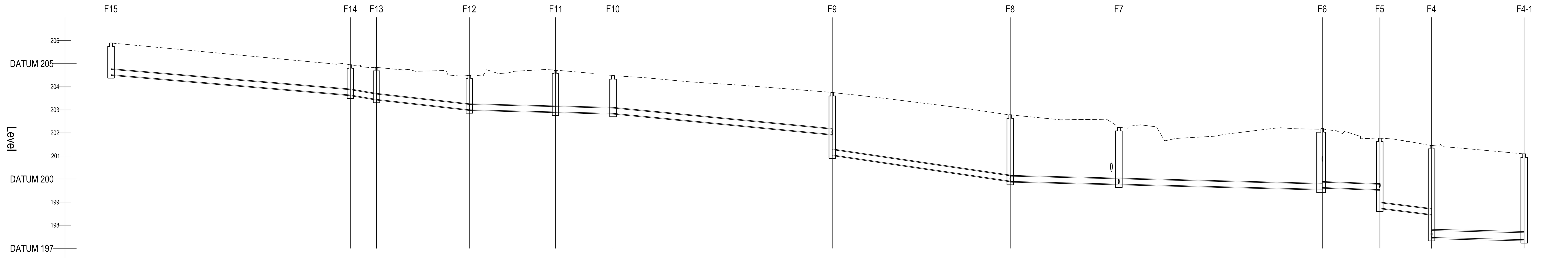
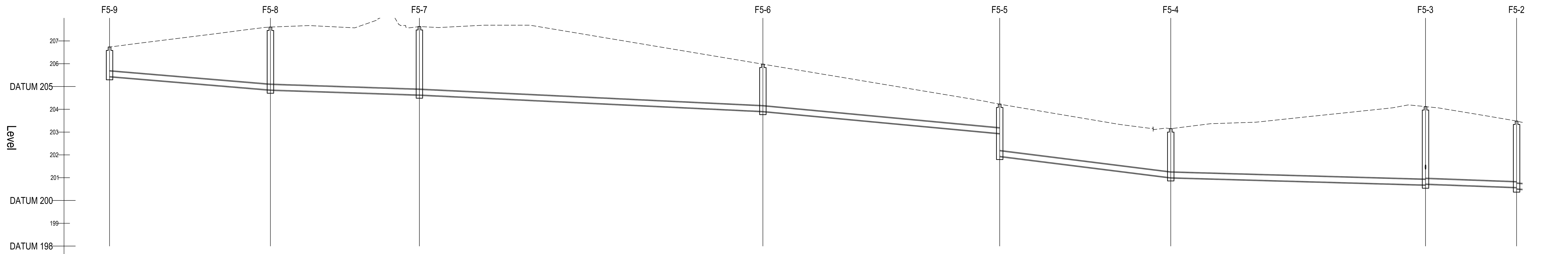


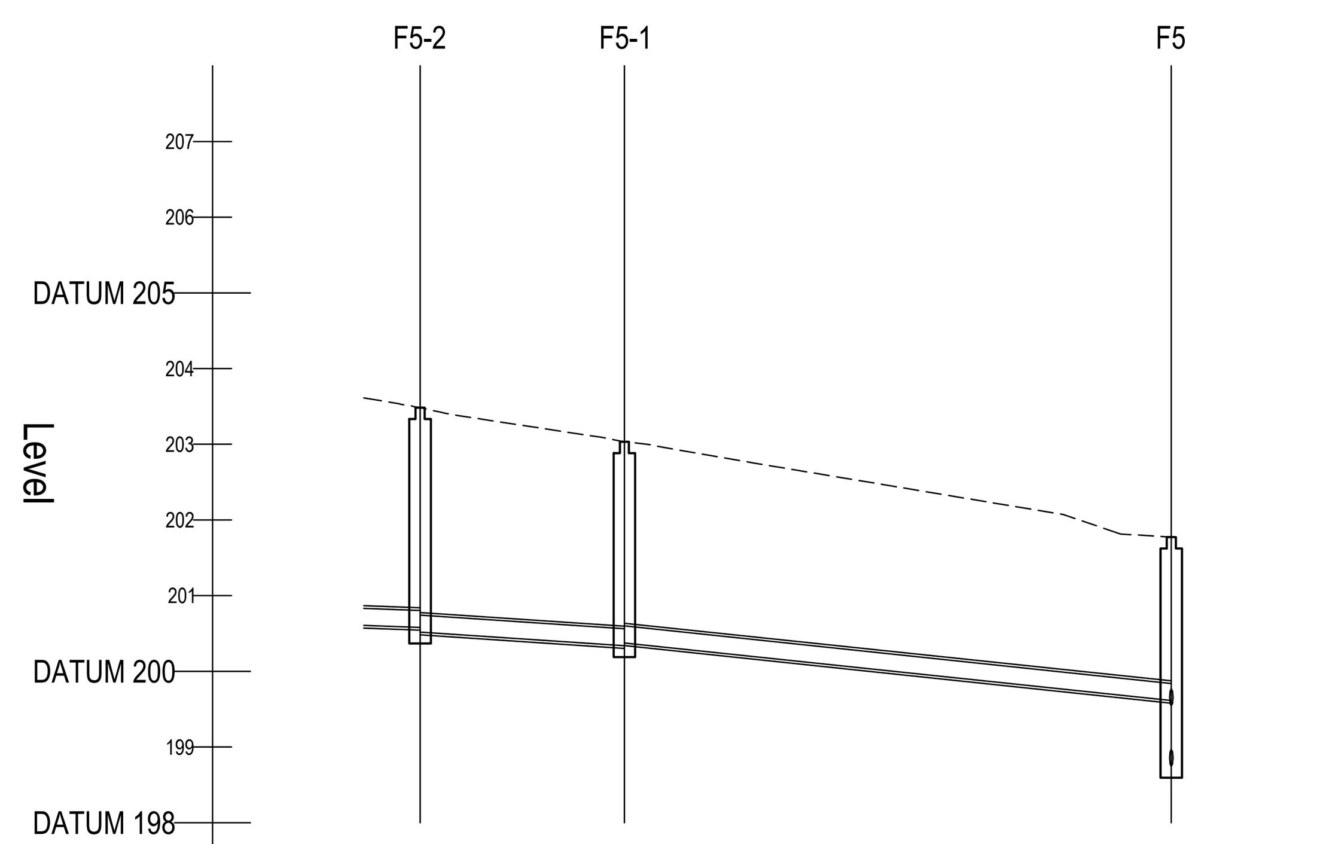
	F15	F14	F13	F12	F11	F10	F9	F8	F7	F6	F5	F4	F4-1
COVER LEVEL	205.898	204.952	204.839	204.497	204.716	204.481	203.751	202.782	202.237	202.183	201.773	201.458	201.090
INVERT LEVEL	204.525	203.645 203.645	203.455 203.455	203.005 203.005	202.912 202.912	202.850 202.849	201.936 201.047	199.913 199.899	199.782 199.782	199.557 199.635	199.544 198.744	198.467 197.467	197.373
DEPTH (m)	1.373	1.307	1.384	1.492	1.804	1.632	2.704	2.883	2.455	2.626	3.029	3.991	3.717
DISTANCE (m)	51.81	5.66	20.10	18.64	12.46	47.46	38.54	23.51	44.05	12.44	11.20	20.05	
PIPE SLOPE	1:59	1:30	1:45	1:200	1:200	1:52	1:34	1:201	1:196	1:137	1:40	1:213	
PIPE SIZE	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	300mm	

SCALE: H 1:500,V 1:100. DATUM: 198.000



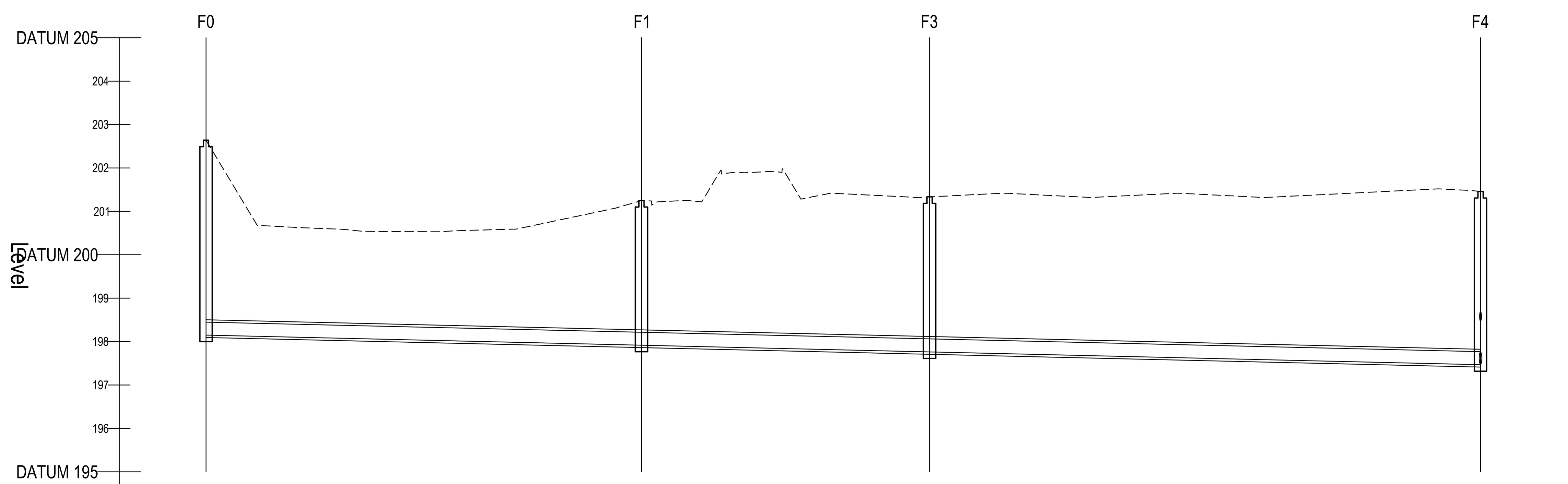
	F5-9	F5-8	F5-7	F5-6	F5-5	F5-4	F5-3	F5-2
COVER LEVEL	206.733	207.608	207.630	205.980	204.229	203.150	204.118	203.483
INVERT LEVEL	205.445	204.856 204.856	204.638 204.638	203.915 203.915	202.945 201.945	201.007 201.007	200.689 200.728	200.579 200.337 200.517
DEPTH (m)	1.288	2.752	2.992	2.065	2.284	2.144	3.429	2.966
DISTANCE (m)	35.30	32.69	75.36	51.96	37.53	55.90	19.98	13.50
PIPE SLOPE	1:60	1:150	1:104	1:54	1:40	1:176	1:134	1:75
PIPE SIZE	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm

SCALE: H 1:500,V 1:100. DATUM: 198.000



		F5-2	F5-1	F5
COVER LEVEL		203.483	203.032	201.773
INVERT LEVEL		200.728 200.579 200.517	200.337 200.375	199.614
DEPTH (m)		2.966	2.695	3.029
DISTANCE (m)	19.98	13.50	36.13	
PIPE SLOPE	1:134	1:75	1:47	
PIPE SIZE	225mm	225mm	225mm	

SCALE: H 1:500,V 1:100. DATUM: 195.000



	F0	F1	F3	F4
COVER LEVEL	202.641	201.249	201.333	201.458
INVERT LEVEL	198.148	197.915 197.915	197.761 197.761	197.467
DEPTH (m)	4.493	3.334	3.572	3.991
DISTANCE (m)	50.17	33.19	63.49	
PIPE SLOPE	1:215	1:216	1:216	
PIPE SIZE	300mm	300mm	300mm	

ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES
2. ALL LEVELS ARE IN METRES AND ARE RELATED TO ORDNANCE DATUM
3. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF PAVEMENT LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE
4. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

KEY

- - - - - - EXISTING GROUND PROFILE
——— PROPOSED GROUND PROFILE

0	dd-mm-yy	revision description	xxx	yyy
rev	date	description	by	chkd.

STATUS CODES

purpose: P1 - INFORMATION
acceptance: S - ISSUED

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project ref.
BLESSINGTON LRD

drawing title
FOUL LONGITUDINAL SECTIONS
SHEET 1

client
MARSHALL YARDS DEVELOPMENT COMPANY LTD'

designed by	author	scale	sheet size
XXX	HvH	VALUE	A1

drawing no.: 230199-X-92-Z00-DTM-DR-DBFL-CE-3321
revision: 0

ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES:

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2. ALL LEVELS ARE IN METRES AND ARE RELATED TO ORDNANCE DATUM
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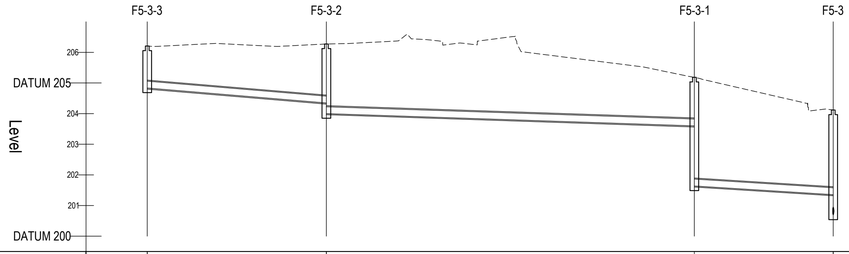
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

KEY

EXISTING GROUND PROFILE

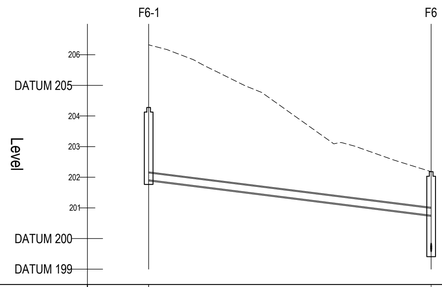
PROPOSED GROUND PROFILE

SCALE: H 1:500,V 1:100. DATUM: 200.000



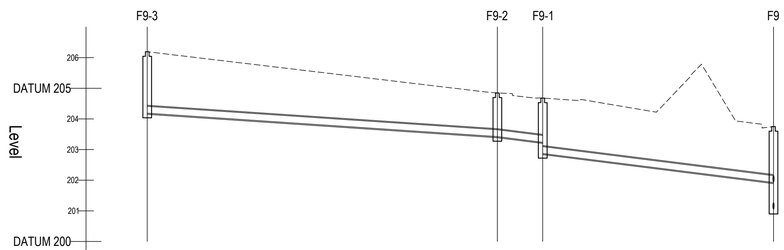
COVER LEVEL	206.207	206.273	205.184	204.118	
INVERT LEVEL	204.635	204.346 / 204.000	203.999 / 201.638	201.355	
DEPTH (m)	1.372	2.273	3.546	3.429	
DISTANCE (m)	29.24	60.07	22.67		
PIPE SLOPE	1:60	1:150	1:80		
PIPE SIZE	225mm	225mm	225mm		

SCALE: H 1:500,V 1:100. DATUM: 199.000



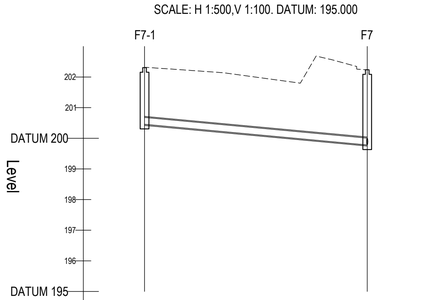
COVER LEVEL	204.278	202.163	
INVERT LEVEL	201.915	200.760	
DEPTH (m)	2.363	2.626	
DISTANCE (m)	46.12		
PIPE SLOPE	1:40		
PIPE SIZE	225mm		

SCALE: H 1:500,V 1:100. DATUM: 200.000



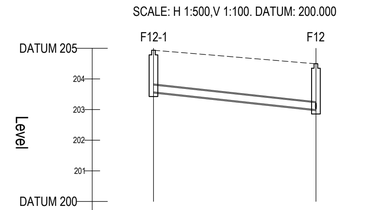
COVER LEVEL	205.193	204.847 / 204.681	203.751	
INVERT LEVEL	204.186	203.422 / 203.422 / 203.255 / 202.871	201.924	
DEPTH (m)	2.007	1.425 / 1.810	2.704	
DISTANCE (m)	57.15	7.40 / 37.67		
PIPE SLOPE	1:75	1:40 / 1:40		
PIPE SIZE	225mm	225mm / 225mm		

SCALE: H 1:500,V 1:100. DATUM: 195.000



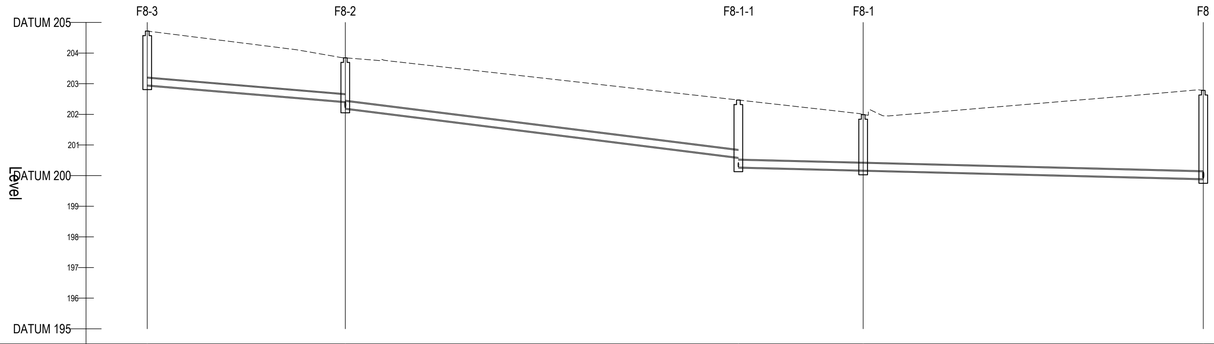
COVER LEVEL	202.307	202.237	
INVERT LEVEL	200.456	199.782	
DEPTH (m)	1.851	2.455	
DISTANCE (m)	36.35		
PIPE SLOPE	1:54		
PIPE SIZE	225mm		

SCALE: H 1:500,V 1:100. DATUM: 200.000



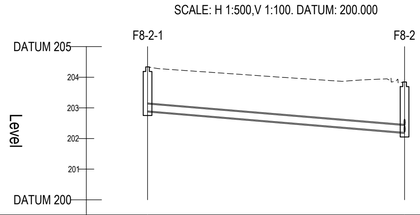
COVER LEVEL	204.937	204.497	
INVERT LEVEL	203.575	202.999	
DEPTH (m)	1.362	1.492	
DISTANCE (m)	26.52		
PIPE SLOPE	1:46		
PIPE SIZE	225mm		

SCALE: H 1:500,V 1:100. DATUM: 195.000



COVER LEVEL	204.718	203.844	202.468	201.991	202.762
INVERT LEVEL	202.957	202.415 / 202.200	200.595 / 200.278	200.177 / 200.177	199.899
DEPTH (m)	1.761	1.644	2.190	1.814	2.883
DISTANCE (m)	32.33	64.17	20.37	55.52	
PIPE SLOPE	1:60	1:40	1:202	1:200	
PIPE SIZE	225mm	225mm	225mm	225mm	

SCALE: H 1:500,V 1:100. DATUM: 200.000



COVER LEVEL	204.338	203.844
INVERT LEVEL	202.900	202.200
DEPTH (m)	1.438	1.644
DISTANCE (m)	41.95	
PIPE SLOPE	1:60	
PIPE SIZE	225mm	

rev	date	description	by	chkd.
0	dd-mm-yy	revision description	xxx	yyy

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FOUL LONGITUDINAL SECTIONS
SHEET 2

client

MARSHALL YARDS DEVELOPMENT COMPANY LTD'

designed by	author	scale	sheet size
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drawing no. 230199-X-92-Z00-DTM-DR-DBFL-CE-3322 | revision 0

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