

DBFL Consulting Engineers		Page 1
Ormond House Upper Ormond Quay Dublin 7	MCC Offices Network Analysis Catchment 1B+2	
Date 14/04/2023 File 220084_Surface water Ne...	Designed by KMM Checked by JPC	
Innovyze	Network 2020.1	

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)	16.100	Add Flow / Climate Change (%)	0
Ratio R	0.271	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

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.233	4-8	0.156

Total Area Contributing (ha) = 0.389

Total Pipe Volume (m³) = 30.708

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
S1.000	12.000	0.200	60.0	0.000	4.00	13.8	0.600	o	225	Pipe/Conduit	
S1.001	12.000	0.164	73.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	55.552	2.200	25.3	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	18.381	0.613	30.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	20.644	0.800	25.8	0.035	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)
S1.000	50.00	4.12	79.500	0.000	13.8	0.0	0.0	1.69	67.3	13.8
S1.001	50.00	4.25	79.300	0.000	13.8	0.0	0.0	1.53	60.9	13.8
S1.002	50.00	4.60	79.136	0.037	13.8	0.0	0.0	2.61	104.0	18.8
S1.003	50.00	4.73	75.284	0.072	13.8	0.0	0.0	2.40	95.4	23.5
S1.004	50.00	4.86	74.672	0.107	13.8	0.0	0.0	2.59	102.8	28.3

DBFL Consulting Engineers		Page 2
Ormond House Upper Ormond Quay Dublin 7	MCC Offices Network Analysis Catchment 1B+2	
Date 14/04/2023 File 220084_Surface water Ne...	Designed by KMM Checked by JPC	
Innovyze	Network 2020.1	

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
S1.005	57.196	1.907	30.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	57.196	1.430	40.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	12.612	0.420	30.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	12.531	0.418	30.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	30.897	1.349	22.9	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	15.000	0.546	27.5	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	15.000	0.600	25.0	0.000	0.00	11.3	0.600	o	225	Pipe/Conduit	
S1.010	82.563	3.753	22.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.011	23.620	1.027	23.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.012	15.458	0.300	51.5	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.013	18.750	0.123	152.4	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.014	2.877	0.131	22.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.015	5.118	0.233	22.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.016	11.643	0.250	46.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.005	50.00	5.26	73.222	0.142	13.8	0.0	0.0	2.40	95.3	33.0
S1.006	50.00	5.72	70.000	0.177	13.8	0.0	0.0	2.07	82.5	37.8
S1.007	50.00	5.81	67.920	0.212	13.8	0.0	0.0	2.40	95.3	42.5
S1.008	50.00	5.90	67.500	0.247	13.8	0.0	0.0	2.40	95.4	47.2
S1.009	50.00	6.08	64.782	0.282	13.8	0.0	0.0	2.75	109.2	52.0
S2.000	50.00	4.10	64.000	0.000	0.0	0.0	0.0	2.51	99.6	0.0
S2.001	50.00	4.19	63.454	0.000	11.3	0.0	0.0	2.63	104.5	11.3
S1.010	50.00	6.57	61.289	0.317	25.1	0.0	0.0	2.80	111.4	68.0
S1.011	50.00	6.72	57.536	0.352	25.1	0.0	0.0	2.74	108.9	72.8
S1.012	50.00	6.84	56.123	0.389	25.1	0.0	0.0	2.20	155.2	77.8
S1.013	50.00	6.96	55.823	0.389	25.1	0.0	0.0	2.54	1613.1	77.8
S1.014	50.00	6.98	55.700	0.389	25.1	0.0	0.0	2.80	111.5	77.8
S1.015	50.00	7.01	55.569	0.389	25.1	0.0	0.0	2.80	111.5	77.8
S1.016	50.00	7.11	53.036	0.389	25.1	0.0	0.0	1.92	76.4	77.8

DBFL Consulting Engineers		Page 3
Ormond House Upper Ormond Quay Dublin 7	MCC Offices Network Analysis Catchment 1B+2	
Date 14/04/2023 File 220084_Surface water Ne...	Designed by KMM Checked by JPC	
Innovyze	Network 2020.1	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Bar
SDUMMY 15-1-1	83.527	4.027	Open Manhole	1200	S1.000	79.500	225				
S15-1	83.268	3.968	Open Manhole	1200	S1.001	79.300	225	S1.000	79.300	225	
S15	82.636	3.500	Open Manhole	1200	S1.002	79.136	225	S1.001	79.136	225	
S14	78.740	3.456	Open Manhole	1200	S1.003	75.284	225	S1.002	76.936	225	
S13	77.269	2.598	Open Manhole	1200	S1.004	74.672	225	S1.003	74.671	225	
S12	75.655	2.433	Open Manhole	1200	S1.005	73.222	225	S1.004	73.872	225	
S11	73.762	3.762	Open Manhole	1200	S1.006	70.000	225	S1.005	71.315	225	
S10	70.806	2.886	Open Manhole	1200	S1.007	67.920	225	S1.006	68.570	225	
S9	69.762	2.262	Open Manhole	1200	S1.008	67.500	225	S1.007	67.500	225	
S8	68.734	3.952	Open Manhole	1200	S1.009	64.782	225	S1.008	67.082	225	
SDUMMY 7-1-1	68.283	4.283	Open Manhole	1200	S2.000	64.000	225				
S7-1	67.454	4.000	Open Manhole	1200	S2.001	63.454	225	S2.000	63.454	225	
S7	66.240	4.951	Open Manhole	1200	S1.010	61.289	225	S1.009	63.433	225	
								S2.001	62.854	225	
S6	59.621	2.085	Open Manhole	1200	S1.011	57.536	225	S1.010	57.536	225	
S5	57.971	1.848	Open Manhole	1200	S1.012	56.123	300	S1.011	56.509	225	
S4	57.500	1.677	Open Manhole	1800	S1.013	55.823	900	S1.012	55.823	300	
S3	57.024	1.324	Open Manhole	1800	S1.014	55.700	225	S1.013	55.700	900	
S2	57.482	1.913	Open Manhole	1200	S1.015	55.569	225	S1.014	55.569	225	
S1	56.500	3.464	Open Manhole	1200	S1.016	53.036	225	S1.015	55.336	225	
S	55.220	2.434	Open Manhole	0		OUTFALL		S1.016	52.786	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SDUMMY 15-1-1	667451.559	833988.060	667451.559	833988.060	Required	
S15-1	667458.206	833998.070	667458.206	833998.070	Required	
S15	667464.710	834008.152	667464.710	834008.152	Required	
S14	667505.106	833970.018	667505.106	833970.018	Required	
S13	667516.434	833955.542	667516.434	833955.542	Required	

