STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.358	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

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	21.852	0.060	364.2	0.052	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	28.024	0.080	350.3	0.026	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	28.998	0.290	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

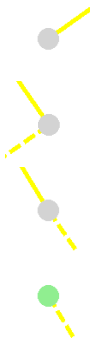
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.34	43.980	0.052	0.0	0.0	0.0	1.06	168.5	7.0
1.001	50.00	5.78	43.920	0.078	0.0	0.0	0.0	1.08	171.8	10.6
1.002	50.00	6.26	43.840	0.078	0.0	0.0	0.0	1.00	17.8	10.6

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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)
BS1	46.000	2.020	Open Manhole	1500	1.000	43.980	450				
BS2	47.825	3.905	Open Manhole	1500	1.001	43.920	450	1.000	43.920	450	
BS3	46.030	2.190	Open Manhole	1500	1.002	43.840	150	1.001	43.840	450	
MH8	46.040	2.490	Open Manhole	1200		OUTFALL		1.002	43.550	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
BS1	384744.271	399237.851	384744.271	399237.851	Required	
BS2	384762.136	399250.435	384762.136	399250.435	Required	
BS3	384746.180	399273.473	384746.180	399273.473	Required	
MH8	384731.074	399298.226			No Entry	



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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	450	BS1	46.000	43.980	1.570	Open Manhole	1500
1.001	o	450	BS2	47.825	43.920	3.455	Open Manhole	1500
1.002	o	150	BS3	46.030	43.840	2.040	Open Manhole	1500

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	21.852	364.2	BS2	47.825	43.920	3.455	Open Manhole	1500
1.001	28.024	350.3	BS3	46.030	43.840	1.740	Open Manhole	1500
1.002	28.998	100.0	MH8	46.040	43.550	2.340	Open Manhole	1200

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)
1.002	MH8	46.040	43.550	0.000	1200	0

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Online Controls for Storm

Orifice Manhole: BS3, DS/PN: 1.002, Volume (m³): 8.1

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 43.840

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