

Nolan Associates Ltd		Page 1
54 Hagley Road Birmingham West Midlands B16 8PE	Newton Heath Depot Portacabin	
Date 06/04/2023 08:57 File NETWORK.MDX	Designed by JJG Checked by	
XP Solutions	Network 2020.1	

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)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	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	0.007	4-8	0.004

Total Area Contributing (ha) = 0.011

Total Pipe Volume (m³) = 0.276

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	22.500	0.225	100.0	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	12.700	0.127	100.0	0.000	0.00	0.0	0.600	o	100	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	5.49	79.585	0.011	0.0	0.0	0.0	0.77	6.0	1.5
1.001	50.00	5.76	79.360	0.011	0.0	0.0	0.0	0.77	6.0	1.5

Nolan Associates Ltd		Page 2
54 Hagley Road Birmingham West Midlands B16 8PE	Newton Heath Depot Portacabin	
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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)	Backdrop (mm)
Aco	79.900	0.315	Open Manhole	1200	1.000	79.585	100				
S1	79.900	0.540	Open Manhole	1200	1.001	79.360	100	1.000	79.360	100	
	79.900	0.667	Open Manhole	0		OUTFALL		1.001	79.233	100	

No coordinates have been specified, layout information cannot be produced.

Nolan Associates Ltd		Page 3
54 Hagley Road Birmingham West Midlands B16 8PE	Newton Heath Depot Portacabin	
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.011	0.011	0.011
1.001	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.011	0.011	0.011

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)
1.001		79.900	79.233	0.000	0	0

Nolan Associates Ltd		Page 4
54 Hagley Road Birmingham West Midlands B16 8PE	Newton Heath Depot Portacabin	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440, 2160, 2880, 4320, 5760,
 7200, 8640, 10080
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

								Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act. Level (m)
1.000	Aco 15	Winter	100	+40%	100/15	Summer		79.895
1.001	S1 15	Winter	100	+40%	30/15	Summer		79.873

			Surcharged Flooded		Half Drain		Pipe		
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	Aco	0.210	0.000	0.73			4.3	FLOOD RISK	
1.001	S1	0.413	0.000	0.34			2.0	FLOOD RISK	