

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		
Network 2020.1.3		

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) 1
 M5-60 (mm) 18.000
 Ratio R 0.354
 Maximum Rainfall (mm/hr) 0
 Maximum Time of Concentration (mins) 30
 Foul Sewage (l/s/ha) 0.000
 Volumetric Runoff Coeff. 0.750
 PIMP (%) 100
 Add Flow / Climate Change (%) 0
 Minimum Backdrop Height (m) 0.200
 Maximum Backdrop Height (m) 1.500
 Min Design Depth for Optimisation (m) 1.200
 Min Vel for Auto Design only (m/s) 1.00
 Min Slope for Optimisation (1:X) 500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.803	4-8	0.438	8-12	0.001

Total Area Contributing (ha) = 1.242

Total Pipe Volume (m³) = 45.738

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
S1.000	37.227	0.372	100.1	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit
S1.001	26.309	0.363	72.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
S1.002	17.218	0.700	24.6	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)	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)
S1.000	0.00	5.62	262.885	0.047	0.0	0.0	0.0	1.00	17.8	0.0
S1.001	0.00	5.99	262.513	0.047	0.0	0.0	0.0	1.18	20.9	0.0
S1.002	0.00	6.13	262.150	0.047	0.0	0.0	0.0	2.04	36.0	0.0

Cadsquare Midlands Ltd										Page 2	
The Stables Woodbury Lane, Norton Worcester WR5 2PT					WERRINGTON STORM NETWORK 21-081 / 601b						
Date 23/02/2022 15:51					Designed by SCH						
File Storm network - Rev C.MDX					Checked by						
Micro Drainage					Network 2020.1.3						
<u>Network Design Table for Storm</u>											
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	
S1.003	13.832	1.500	9.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	13.214	1.300	10.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	24.559	0.850	28.9	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	10.694	0.300	35.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	10.703	0.500	21.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	53.844	6.143	8.8	0.168	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	28.022	0.168	166.8	0.129	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.009	11.740	0.070	167.7	0.085	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	44.795	2.611	17.2	0.085	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	13.797	0.083	166.2	0.087	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	40.549	0.243	166.9	0.106	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.002	15.041	0.090	167.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.003	22.197	0.133	166.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	15.481	0.155	99.9	0.150	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.012	11.588	0.116	99.9	0.055	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.013	35.269	0.806	43.8	0.081	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.014	47.852	0.345	138.6	0.066	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.015	10.928	0.079	138.6	0.152	0.00	0.0	0.600	o	525	Pipe/Conduit	
<u>Network Results Table</u>											
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)	
S1.003	0.00	6.20	261.450	0.047	0.0	0.0	0.0	3.34	59.0	0.0	
S1.004	0.00	6.27	259.950	0.047	0.0	0.0	0.0	3.18	56.2	0.0	
S1.005	0.00	6.44	258.575	0.078	0.0	0.0	0.0	2.44	97.1	0.0	
S1.006	0.00	6.52	257.725	0.078	0.0	0.0	0.0	2.20	87.4	0.0	
S1.007	0.00	6.58	257.425	0.078	0.0	0.0	0.0	2.84	112.9	0.0	
S1.008	0.00	6.78	256.925	0.246	0.0	0.0	0.0	4.45	176.8	0.0	
S2.000	0.00	5.38	250.875	0.129	0.0	0.0	0.0	1.21	85.9	0.0	
S1.009	0.00	6.94	250.707	0.460	0.0	0.0	0.0	1.21	85.6	0.0	
S1.010	0.00	7.11	250.562	0.545	0.0	0.0	0.0	4.39	485.2	0.0	
S3.000	0.00	5.23	248.650	0.087	0.0	0.0	0.0	1.01	40.2	0.0	
S3.001	0.00	5.71	248.417	0.193	0.0	0.0	0.0	1.40	154.6	0.0	
S3.002	0.00	5.89	248.174	0.193	0.0	0.0	0.0	1.40	154.5	0.0	
S3.003	0.00	6.15	248.084	0.193	0.0	0.0	0.0	1.40	154.6	0.0	
S1.011	0.00	7.24	247.876	0.888	0.0	0.0	0.0	2.03	323.6	0.0	
S1.012	0.00	7.33	247.721	0.943	0.0	0.0	0.0	2.03	323.5	0.0	
S1.013	0.00	7.52	247.605	1.024	0.0	0.0	0.0	3.08	489.9	0.0	
S1.014	0.00	7.94	246.724	1.090	0.0	0.0	0.0	1.90	411.5	0.0	
S1.015	0.00	8.04	246.379	1.242	0.0	0.0	0.0	1.90	411.5	0.0	
©1982-2020 Innovzye											

Cadsquare Midlands Ltd		Page 3
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

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
S1.016	18.581	1.410	13.2	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)
S1.016	0.00	8.15	246.300	1.242	0.0	0.0	0.0	2.79	49.3	0.0

Cadsquare Midlands Ltd		Page 4
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.047	0.047	0.047
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.031	0.031	0.031
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.168	0.168	0.168
2.000	-	-	100	0.129	0.129	0.129
1.009	-	-	100	0.085	0.085	0.085
1.010	-	-	100	0.085	0.085	0.085
3.000	-	-	100	0.087	0.087	0.087
3.001	-	-	100	0.106	0.106	0.106
3.002	-	-	100	0.000	0.000	0.000
3.003	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.150	0.150	0.150
1.012	-	-	100	0.055	0.055	0.055
1.013	-	-	100	0.081	0.081	0.081
1.014	-	-	100	0.066	0.066	0.066
1.015	-	-	100	0.152	0.152	0.152
1.016	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.242	1.242	1.242

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)
---------------------	--------------	--------------	--------------	------------------	----------	--------

S1.016	SEx MH	247.700	244.890	244.890	1200	0
--------	--------	---------	---------	---------	------	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Region	England and Wales
Return Period (years)	2	M5-60 (mm)	18.000

Cadsquare Midlands Ltd		Page 5
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3
Synthetic Rainfall Details Ratio R 0.354Cv (Winter) 0.840 Profile Type Summer Storm Duration (mins) 15 Cv (Summer) 0.750		
©1982-2020 Innovyze		

Cadsquare Midlands Ltd		Page 6
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S16, DS/PN: S1.016, Volume (m³): 5.0

Unit Reference	MD-SHE-0059-2000-1700-2000
Design Head (m)	1.700
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	59
Invert Level (m)	246.300
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	2.0
Flush-Flo™	0.257	1.5
Kick-Flo®	0.527	1.2
Mean Flow over Head Range	-	1.5

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	1.3	1.200	1.7	3.000	2.6	7.000	3.8
0.200	1.4	1.400	1.8	3.500	2.8	7.500	4.0
0.300	1.4	1.600	1.9	4.000	3.0	8.000	4.1
0.400	1.4	1.800	2.1	4.500	3.1	8.500	4.2
0.500	1.3	2.000	2.2	5.000	3.3	9.000	4.3
0.600	1.3	2.200	2.2	5.500	3.4	9.500	4.4
0.800	1.4	2.400	2.3	6.000	3.6		
1.000	1.6	2.600	2.4	6.500	3.7		

Cadsquare Midlands Ltd		Page 7
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Storage Structures for Storm

Tank or Pond Manhole: S16, DS/PN: S1.016

Invert Level (m) 246.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	624.0	1.200	1178.0

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:53 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3

Summary of Results for 180 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	262.923	-0.112	0.000	0.15		2.5	OK
S1.001	S2	262.548	-0.115	0.000	0.12		2.5	OK
S1.002	S3	262.177	-0.123	0.000	0.07		2.5	OK
S1.003	S4	261.471	-0.129	0.000	0.05		2.5	OK
S1.004	S5	259.971	-0.129	0.000	0.05		2.5	OK
S1.005	S1	258.606	-0.194	0.000	0.05		4.1	OK
S1.006	S2	257.759	-0.191	0.000	0.06		4.1	OK
S1.007	S3	257.455	-0.195	0.000	0.04		4.1	OK
S1.008	S3	256.966	-0.184	0.000	0.07		12.7	OK
S2.000	S4	250.935	-0.240	0.000	0.09		6.9	OK
S1.009	S5	250.832	-0.175	0.000	0.36		23.8	OK
S1.010	S6	250.624	-0.313	0.000	0.06		28.1	OK
S3.000	S7	248.704	-0.171	0.000	0.13		4.7	OK
S3.001	S8	248.483	-0.309	0.000	0.07		10.1	OK
S3.002	S9	248.248	-0.301	0.000	0.09		10.0	OK
S3.003	S10	248.153	-0.306	0.000	0.08		10.0	OK
S1.011	S11	248.016	-0.310	0.000	0.21		45.8	OK
S1.012	S12	247.876	-0.295	0.000	0.25		48.8	OK
S1.013	S13	247.710	-0.345	0.000	0.12		53.1	OK
S1.014	S14	247.042	-0.207	0.000	0.15		56.3	OK
S1.015	S15	247.040	0.137	0.000	0.25		62.2	SURCHARGED
S1.016	S16	247.040	0.590	0.000	0.03		1.5	SURCHARGED

Cadsquare Midlands Ltd

The Stables
Woodbury Lane, Norton
Worcester WR5 2PT

Date 23/02/2022 15:54
File Storm network - Rev C.MDX

WERRINGTON
STORM NETWORK
21-081 / 601b

Designed by SCH
Checked by

Micro Drainage

Network 2020.1.3

Page 1



Summary of Results for 360 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm)300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS StatusON

DVD StatusOFF

Inertia StatusOFF

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
S1.000	S1	262.915	-0.120	0.000	0.09			1.6	OK
S1.001	S2	262.541	-0.122	0.000	0.08			1.6	OK
S1.002	S3	262.171	-0.129	0.000	0.05			1.6	OK
S1.003	S4	261.467	-0.133	0.000	0.03			1.6	OK
S1.004	S5	259.967	-0.133	0.000	0.03			1.6	OK
S1.005	S1	258.600	-0.200	0.000	0.03			2.6	OK
S1.006	S2	257.752	-0.198	0.000	0.04			2.6	OK
S1.007	S3	257.450	-0.200	0.000	0.03			2.6	OK
S1.008	S3	256.956	-0.194	0.000	0.05			8.2	OK
S2.000	S4	250.920	-0.255	0.000	0.06			4.3	OK
S1.009	S5	250.804	-0.203	0.000	0.23			15.3	OK
S1.010	S6	250.610	-0.327	0.000	0.04			18.1	OK
S3.000	S7	248.693	-0.182	0.000	0.08			2.9	OK
S3.001	S8	248.468	-0.324	0.000	0.05			6.4	OK
S3.002	S9	248.230	-0.319	0.000	0.05			6.4	OK
S3.003	S10	248.137	-0.322	0.000	0.05			6.4	OK
S1.011	S11	247.984	-0.342	0.000	0.13			29.4	OK
S1.012	S12	247.842	-0.329	0.000	0.16			31.2	OK
S1.013	S13	247.689	-0.366	0.000	0.08			33.8	OK
S1.014	S14	247.082	-0.167	0.000	0.10			35.7	OK
S1.015	S15	247.081	0.177	0.000	0.16			39.5	SURCHARGED
S1.016	S16	247.081	0.631	0.000	0.03			1.5	SURCHARGED

©1982-2020 Innovyze

Cadsquare Midlands Ltd		Page 1																																																																																																																																																																																																																																						
The Stables Woodbury Lane, Norton Worcester WR5 2PT																																																																																																																																																																																																																																								
WERRINGTON STORM NETWORK 21-081 / 601b																																																																																																																																																																																																																																								
Date 23/02/2022 15:54 File Storm network - Rev C.MDX																																																																																																																																																																																																																																								
Designed by SCH																																																																																																																																																																																																																																								
Checked by																																																																																																																																																																																																																																								
Micro Drainage		Network 2020.1.3																																																																																																																																																																																																																																						
<u>Summary of Results for 600 minute 2 year Summer (Storm)</u> Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON DVD Status OFF Inertia Status OFF <table><thead><tr><th>PN</th><th>US/MH Name</th><th>Water Level (m)</th><th>Surcharged Depth (m)</th><th>Flooded Volume (m³)</th><th>Flow / Cap.</th><th>Overflow (l/s)</th><th>Half Drain Time (mins)</th><th>Pipe Flow (l/s)</th><th>Status</th></tr></thead><tbody><tr><td>S1.000</td><td>S1</td><td>262.909</td><td>-0.126</td><td>0.000</td><td>0.06</td><td></td><td></td><td>1.1</td><td>OK</td></tr><tr><td>S1.001</td><td>S2</td><td>262.535</td><td>-0.128</td><td>0.000</td><td>0.05</td><td></td><td></td><td>1.1</td><td>OK</td></tr><tr><td>S1.002</td><td>S3</td><td>262.167</td><td>-0.133</td><td>0.000</td><td>0.03</td><td></td><td></td><td>1.1</td><td>OK</td></tr><tr><td>S1.003</td><td>S4</td><td>261.464</td><td>-0.136</td><td>0.000</td><td>0.02</td><td></td><td></td><td>1.1</td><td>OK</td></tr><tr><td>S1.004</td><td>S5</td><td>259.965</td><td>-0.135</td><td>0.000</td><td>0.02</td><td></td><td></td><td>1.1</td><td>OK</td></tr><tr><td>S1.005</td><td>S1</td><td>258.596</td><td>-0.204</td><td>0.000</td><td>0.02</td><td></td><td></td><td>1.8</td><td>OK</td></tr><tr><td>S1.006</td><td>S2</td><td>257.749</td><td>-0.201</td><td>0.000</td><td>0.02</td><td></td><td></td><td>1.8</td><td>OK</td></tr><tr><td>S1.007</td><td>S3</td><td>257.445</td><td>-0.205</td><td>0.000</td><td>0.02</td><td></td><td></td><td>1.8</td><td>OK</td></tr><tr><td>S1.008</td><td>S3</td><td>256.952</td><td>-0.198</td><td>0.000</td><td>0.03</td><td></td><td></td><td>5.7</td><td>OK</td></tr><tr><td>S2.000</td><td>S4</td><td>250.913</td><td>-0.262</td><td>0.000</td><td>0.04</td><td></td><td></td><td>3.0</td><td>OK</td></tr><tr><td>S1.009</td><td>S5</td><td>250.787</td><td>-0.220</td><td>0.000</td><td>0.16</td><td></td><td></td><td>10.6</td><td>OK</td></tr><tr><td>S1.010</td><td>S6</td><td>250.603</td><td>-0.334</td><td>0.000</td><td>0.03</td><td></td><td></td><td>12.6</td><td>OK</td></tr><tr><td>S3.000</td><td>S7</td><td>248.685</td><td>-0.190</td><td>0.000</td><td>0.06</td><td></td><td></td><td>2.0</td><td>OK</td></tr><tr><td>S3.001</td><td>S8</td><td>248.460</td><td>-0.332</td><td>0.000</td><td>0.03</td><td></td><td></td><td>4.5</td><td>OK</td></tr><tr><td>S3.002</td><td>S9</td><td>248.221</td><td>-0.328</td><td>0.000</td><td>0.04</td><td></td><td></td><td>4.5</td><td>OK</td></tr><tr><td>S3.003</td><td>S10</td><td>248.129</td><td>-0.330</td><td>0.000</td><td>0.03</td><td></td><td></td><td>4.5</td><td>OK</td></tr><tr><td>S1.011</td><td>S11</td><td>247.968</td><td>-0.358</td><td>0.000</td><td>0.09</td><td></td><td></td><td>20.5</td><td>OK</td></tr><tr><td>S1.012</td><td>S12</td><td>247.821</td><td>-0.350</td><td>0.000</td><td>0.11</td><td></td><td></td><td>21.8</td><td>OK</td></tr><tr><td>S1.013</td><td>S13</td><td>247.673</td><td>-0.382</td><td>0.000</td><td>0.06</td><td></td><td></td><td>23.6</td><td>OK</td></tr><tr><td>S1.014</td><td>S14</td><td>247.105</td><td>-0.144</td><td>0.000</td><td>0.07</td><td></td><td></td><td>25.0</td><td>OK</td></tr><tr><td>S1.015</td><td>S15</td><td>247.105</td><td>0.202</td><td>0.000</td><td>0.11</td><td></td><td></td><td>27.7</td><td>SURCHARGED</td></tr><tr><td>S1.016</td><td>S16</td><td>247.105</td><td>0.655</td><td>0.000</td><td>0.03</td><td></td><td></td><td>1.5</td><td>SURCHARGED</td></tr></tbody></table>			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	S1.000	S1	262.909	-0.126	0.000	0.06			1.1	OK	S1.001	S2	262.535	-0.128	0.000	0.05			1.1	OK	S1.002	S3	262.167	-0.133	0.000	0.03			1.1	OK	S1.003	S4	261.464	-0.136	0.000	0.02			1.1	OK	S1.004	S5	259.965	-0.135	0.000	0.02			1.1	OK	S1.005	S1	258.596	-0.204	0.000	0.02			1.8	OK	S1.006	S2	257.749	-0.201	0.000	0.02			1.8	OK	S1.007	S3	257.445	-0.205	0.000	0.02			1.8	OK	S1.008	S3	256.952	-0.198	0.000	0.03			5.7	OK	S2.000	S4	250.913	-0.262	0.000	0.04			3.0	OK	S1.009	S5	250.787	-0.220	0.000	0.16			10.6	OK	S1.010	S6	250.603	-0.334	0.000	0.03			12.6	OK	S3.000	S7	248.685	-0.190	0.000	0.06			2.0	OK	S3.001	S8	248.460	-0.332	0.000	0.03			4.5	OK	S3.002	S9	248.221	-0.328	0.000	0.04			4.5	OK	S3.003	S10	248.129	-0.330	0.000	0.03			4.5	OK	S1.011	S11	247.968	-0.358	0.000	0.09			20.5	OK	S1.012	S12	247.821	-0.350	0.000	0.11			21.8	OK	S1.013	S13	247.673	-0.382	0.000	0.06			23.6	OK	S1.014	S14	247.105	-0.144	0.000	0.07			25.0	OK	S1.015	S15	247.105	0.202	0.000	0.11			27.7	SURCHARGED	S1.016	S16	247.105	0.655	0.000	0.03			1.5	SURCHARGED
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																																																																																																																																																																																																																															
S1.000	S1	262.909	-0.126	0.000	0.06			1.1	OK																																																																																																																																																																																																																															
S1.001	S2	262.535	-0.128	0.000	0.05			1.1	OK																																																																																																																																																																																																																															
S1.002	S3	262.167	-0.133	0.000	0.03			1.1	OK																																																																																																																																																																																																																															
S1.003	S4	261.464	-0.136	0.000	0.02			1.1	OK																																																																																																																																																																																																																															
S1.004	S5	259.965	-0.135	0.000	0.02			1.1	OK																																																																																																																																																																																																																															
S1.005	S1	258.596	-0.204	0.000	0.02			1.8	OK																																																																																																																																																																																																																															
S1.006	S2	257.749	-0.201	0.000	0.02			1.8	OK																																																																																																																																																																																																																															
S1.007	S3	257.445	-0.205	0.000	0.02			1.8	OK																																																																																																																																																																																																																															
S1.008	S3	256.952	-0.198	0.000	0.03			5.7	OK																																																																																																																																																																																																																															
S2.000	S4	250.913	-0.262	0.000	0.04			3.0	OK																																																																																																																																																																																																																															
S1.009	S5	250.787	-0.220	0.000	0.16			10.6	OK																																																																																																																																																																																																																															
S1.010	S6	250.603	-0.334	0.000	0.03			12.6	OK																																																																																																																																																																																																																															
S3.000	S7	248.685	-0.190	0.000	0.06			2.0	OK																																																																																																																																																																																																																															
S3.001	S8	248.460	-0.332	0.000	0.03			4.5	OK																																																																																																																																																																																																																															
S3.002	S9	248.221	-0.328	0.000	0.04			4.5	OK																																																																																																																																																																																																																															
S3.003	S10	248.129	-0.330	0.000	0.03			4.5	OK																																																																																																																																																																																																																															
S1.011	S11	247.968	-0.358	0.000	0.09			20.5	OK																																																																																																																																																																																																																															
S1.012	S12	247.821	-0.350	0.000	0.11			21.8	OK																																																																																																																																																																																																																															
S1.013	S13	247.673	-0.382	0.000	0.06			23.6	OK																																																																																																																																																																																																																															
S1.014	S14	247.105	-0.144	0.000	0.07			25.0	OK																																																																																																																																																																																																																															
S1.015	S15	247.105	0.202	0.000	0.11			27.7	SURCHARGED																																																																																																																																																																																																																															
S1.016	S16	247.105	0.655	0.000	0.03			1.5	SURCHARGED																																																																																																																																																																																																																															
©1982-2020 Innovyze																																																																																																																																																																																																																																								

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:55 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3

Summary of Results for 1440 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	262.903	-0.132	0.000	0.03		0.6	OK
S1.001	S2	262.530	-0.133	0.000	0.03		0.6	OK
S1.002	S3	262.162	-0.138	0.000	0.02		0.6	OK
S1.003	S4	261.458	-0.142	0.000	0.01		0.6	OK
S1.004	S5	259.958	-0.142	0.000	0.01		0.6	OK
S1.005	S1	258.586	-0.214	0.000	0.01		1.0	OK
S1.006	S2	257.739	-0.211	0.000	0.01		1.0	OK
S1.007	S3	257.436	-0.214	0.000	0.01		1.0	OK
S1.008	S3	256.944	-0.206	0.000	0.02		3.0	OK
S2.000	S4	250.904	-0.271	0.000	0.02		1.6	OK
S1.009	S5	250.766	-0.241	0.000	0.09		5.7	OK
S1.010	S6	250.589	-0.348	0.000	0.02		6.7	OK
S3.000	S7	248.676	-0.199	0.000	0.03		1.1	OK
S3.001	S8	248.447	-0.345	0.000	0.02		2.4	OK
S3.002	S9	248.210	-0.339	0.000	0.02		2.4	OK
S3.003	S10	248.116	-0.343	0.000	0.02		2.4	OK
S1.011	S11	247.940	-0.386	0.000	0.05		11.0	OK
S1.012	S12	247.792	-0.379	0.000	0.06		11.7	OK
S1.013	S13	247.656	-0.399	0.000	0.03		12.7	OK
S1.014	S14	247.116	-0.133	0.000	0.04		13.4	OK
S1.015	S15	247.116	0.213	0.000	0.06		14.9	SURCHARGED
S1.016	S16	247.116	0.666	0.000	0.03		1.5	SURCHARGED

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		
Network 2020.1.3		

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) 1
 M5-60 (mm) 18.000
 Ratio R 0.354
 Maximum Rainfall (mm/hr) 0
 Maximum Time of Concentration (mins) 30
 Foul Sewage (l/s/ha) 0.000
 Volumetric Runoff Coeff. 0.750
 PIMP (%) 100
 Add Flow / Climate Change (%) 0
 Minimum Backdrop Height (m) 0.200
 Maximum Backdrop Height (m) 1.500
 Min Design Depth for Optimisation (m) 1.200
 Min Vel for Auto Design only (m/s) 1.00
 Min Slope for Optimisation (1:X) 500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.803	4-8	0.438	8-12	0.001

Total Area Contributing (ha) = 1.242

Total Pipe Volume (m³) = 45.738

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
S1.000	37.227	0.372	100.1	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit
S1.001	26.309	0.363	72.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
S1.002	17.218	0.700	24.6	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)	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)
S1.000	0.00	5.62	262.885	0.047	0.0	0.0	0.0	1.00	17.8	0.0
S1.001	0.00	5.99	262.513	0.047	0.0	0.0	0.0	1.18	20.9	0.0
S1.002	0.00	6.13	262.150	0.047	0.0	0.0	0.0	2.04	36.0	0.0

Cadsquare Midlands Ltd										Page 2	
The Stables Woodbury Lane, Norton Worcester WR5 2PT					WERRINGTON STORM NETWORK 21-081 / 601b						
Date 23/02/2022 15:51					Designed by SCH						
File Storm network - Rev C.MDX					Checked by						
Micro Drainage					Network 2020.1.3						
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	
S1.003	13.832	1.500	9.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	13.214	1.300	10.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	24.559	0.850	28.9	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	10.694	0.300	35.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	10.703	0.500	21.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	53.844	6.143	8.8	0.168	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	28.022	0.168	166.8	0.129	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.009	11.740	0.070	167.7	0.085	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	44.795	2.611	17.2	0.085	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	13.797	0.083	166.2	0.087	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	40.549	0.243	166.9	0.106	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.002	15.041	0.090	167.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.003	22.197	0.133	166.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	15.481	0.155	99.9	0.150	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.012	11.588	0.116	99.9	0.055	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.013	35.269	0.806	43.8	0.081	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.014	47.852	0.345	138.6	0.066	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.015	10.928	0.079	138.6	0.152	0.00	0.0	0.600	o	525	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)	
S1.003	0.00	6.20	261.450	0.047	0.0	0.0	0.0	3.34	59.0	0.0	
S1.004	0.00	6.27	259.950	0.047	0.0	0.0	0.0	3.18	56.2	0.0	
S1.005	0.00	6.44	258.575	0.078	0.0	0.0	0.0	2.44	97.1	0.0	
S1.006	0.00	6.52	257.725	0.078	0.0	0.0	0.0	2.20	87.4	0.0	
S1.007	0.00	6.58	257.425	0.078	0.0	0.0	0.0	2.84	112.9	0.0	
S1.008	0.00	6.78	256.925	0.246	0.0	0.0	0.0	4.45	176.8	0.0	
S2.000	0.00	5.38	250.875	0.129	0.0	0.0	0.0	1.21	85.9	0.0	
S1.009	0.00	6.94	250.707	0.460	0.0	0.0	0.0	1.21	85.6	0.0	
S1.010	0.00	7.11	250.562	0.545	0.0	0.0	0.0	4.39	485.2	0.0	
S3.000	0.00	5.23	248.650	0.087	0.0	0.0	0.0	1.01	40.2	0.0	
S3.001	0.00	5.71	248.417	0.193	0.0	0.0	0.0	1.40	154.6	0.0	
S3.002	0.00	5.89	248.174	0.193	0.0	0.0	0.0	1.40	154.5	0.0	
S3.003	0.00	6.15	248.084	0.193	0.0	0.0	0.0	1.40	154.6	0.0	
S1.011	0.00	7.24	247.876	0.888	0.0	0.0	0.0	2.03	323.6	0.0	
S1.012	0.00	7.33	247.721	0.943	0.0	0.0	0.0	2.03	323.5	0.0	
S1.013	0.00	7.52	247.605	1.024	0.0	0.0	0.0	3.08	489.9	0.0	
S1.014	0.00	7.94	246.724	1.090	0.0	0.0	0.0	1.90	411.5	0.0	
S1.015	0.00	8.04	246.379	1.242	0.0	0.0	0.0	1.90	411.5	0.0	
©1982-2020 Innovzye											

Cadsquare Midlands Ltd		Page 3
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3

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
S1.016	18.581	1.410	13.2	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)
S1.016	0.00	8.15	246.300	1.242	0.0	0.0	0.0	2.79	49.3	0.0

Cadsquare Midlands Ltd		Page 4
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.047	0.047	0.047
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.031	0.031	0.031
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.168	0.168	0.168
2.000	-	-	100	0.129	0.129	0.129
1.009	-	-	100	0.085	0.085	0.085
1.010	-	-	100	0.085	0.085	0.085
3.000	-	-	100	0.087	0.087	0.087
3.001	-	-	100	0.106	0.106	0.106
3.002	-	-	100	0.000	0.000	0.000
3.003	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.150	0.150	0.150
1.012	-	-	100	0.055	0.055	0.055
1.013	-	-	100	0.081	0.081	0.081
1.014	-	-	100	0.066	0.066	0.066
1.015	-	-	100	0.152	0.152	0.152
1.016	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.242	1.242	1.242

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)
---------------------	--------------	--------------	--------------	------------------	----------	--------

S1.016	SEx MH	247.700	244.890	244.890	1200	0
--------	--------	---------	---------	---------	------	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Region	England and Wales
Return Period (years)	2	M5-60 (mm)	18.000

Cadsquare Midlands Ltd		Page 5
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage Network 2020.1.3		
Synthetic Rainfall Details Ratio R 0.354Cv (Winter) 0.840 Profile Type Winter Storm Duration (mins) 15 Cv (Summer) 0.750		
©1982-2020 Innovyze		

Cadsquare Midlands Ltd		Page 6
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S16, DS/PN: S1.016, Volume (m³): 5.0

Unit Reference	MD-SHE-0059-2000-1700-2000
Design Head (m)	1.700
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	59
Invert Level (m)	246.300
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	2.0
Flush-Flo™	0.257	1.5
Kick-Flo®	0.527	1.2
Mean Flow over Head Range	-	1.5

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	1.3	1.200	1.7	3.000	2.6	7.000	3.8
0.200	1.4	1.400	1.8	3.500	2.8	7.500	4.0
0.300	1.4	1.600	1.9	4.000	3.0	8.000	4.1
0.400	1.4	1.800	2.1	4.500	3.1	8.500	4.2
0.500	1.3	2.000	2.2	5.000	3.3	9.000	4.3
0.600	1.3	2.200	2.2	5.500	3.4	9.500	4.4
0.800	1.4	2.400	2.3	6.000	3.6		
1.000	1.6	2.600	2.4	6.500	3.7		

Cadsquare Midlands Ltd		Page 7
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:51 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage	Network 2020.1.3	

Storage Structures for Storm

Tank or Pond Manhole: S16, DS/PN: S1.016

Invert Level (m) 246.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	624.0	1.200	1178.0

Cadsquare Midlands Ltd

The Stables

Woodbury Lane, Norton

Worcester WR5 2PT

WERRINGTON

STORM NETWORK

21-081 / 601b

Date 23/02/2022 15:51

File Storm network - Rev C.MDX

Designed by SCH

Checked by

Micro Drainage

Network 2020.1.3

Page 8



Summary of Results for 15 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

OFF

Inertia Status

OFF

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
S1.000	S1	262.954	-0.081	0.000	0.42			7.1	OK
S1.001	S2	262.575	-0.088	0.000	0.36			7.1	OK
S1.002	S3	262.197	-0.103	0.000	0.21			7.0	OK
S1.003	S4	261.486	-0.114	0.000	0.13			7.1	OK
S1.004	S5	259.987	-0.113	0.000	0.14			7.1	OK
S1.005	S1	258.627	-0.173	0.000	0.12			10.8	OK
S1.006	S2	257.783	-0.167	0.000	0.15			10.9	OK
S1.007	S3	257.476	-0.174	0.000	0.11			10.9	OK
S1.008	S3	256.991	-0.159	0.000	0.19			31.9	OK
S2.000	S4	250.986	-0.189	0.000	0.25			19.5	OK
S1.009	S5	250.936	-0.071	0.000	0.94			62.3	OK
S1.010	S6	250.663	-0.274	0.000	0.16			73.1	OK
S3.000	S7	248.747	-0.128	0.000	0.38			13.5	OK
S3.001	S8	248.530	-0.262	0.000	0.19			27.1	OK
S3.002	S9	248.295	-0.254	0.000	0.23			27.1	OK
S3.003	S10	248.199	-0.260	0.000	0.20			27.0	OK
S1.011	S11	248.112	-0.214	0.000	0.53			117.8	OK
S1.012	S12	247.988	-0.183	0.000	0.65			125.3	OK
S1.013	S13	247.778	-0.277	0.000	0.31			135.2	OK
S1.014	S14	246.969	-0.280	0.000	0.39			141.3	OK
S1.015	S15	246.919	0.015	0.000	0.62			152.9	SURCHARGED
S1.016	S16	246.918	0.468	0.000	0.03			1.4	SURCHARGED

©1982-2020 Innovyze

Cadsquare Midlands Ltd		Page 1																																																																																																																																																																																																																																						
The Stables Woodbury Lane, Norton Worcester WR5 2PT																																																																																																																																																																																																																																								
WERRINGTON STORM NETWORK 21-081 / 601b																																																																																																																																																																																																																																								
Date 23/02/2022 15:53 File Storm network - Rev C.MDX																																																																																																																																																																																																																																								
Designed by SCH																																																																																																																																																																																																																																								
Checked by																																																																																																																																																																																																																																								
Micro Drainage		Network 2020.1.3																																																																																																																																																																																																																																						
<u>Summary of Results for 60 minute 2 year Winter (Storm)</u> Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON DVD Status OFF Inertia Status OFF <table><thead><tr><th>PN</th><th>US/MH Name</th><th>Water Level (m)</th><th>Surcharged Depth (m)</th><th>Flooded Volume (m³)</th><th>Flow / Cap.</th><th>Overflow (l/s)</th><th>Half Drain Time (mins)</th><th>Pipe Flow (l/s)</th><th>Status</th></tr></thead><tbody><tr><td>S1.000</td><td>S1</td><td>262.933</td><td>-0.102</td><td>0.000</td><td>0.22</td><td></td><td></td><td>3.8</td><td>OK</td></tr><tr><td>S1.001</td><td>S2</td><td>262.558</td><td>-0.105</td><td>0.000</td><td>0.19</td><td></td><td></td><td>3.9</td><td>OK</td></tr><tr><td>S1.002</td><td>S3</td><td>262.184</td><td>-0.116</td><td>0.000</td><td>0.11</td><td></td><td></td><td>3.9</td><td>OK</td></tr><tr><td>S1.003</td><td>S4</td><td>261.476</td><td>-0.124</td><td>0.000</td><td>0.07</td><td></td><td></td><td>3.8</td><td>OK</td></tr><tr><td>S1.004</td><td>S5</td><td>259.977</td><td>-0.123</td><td>0.000</td><td>0.07</td><td></td><td></td><td>3.8</td><td>OK</td></tr><tr><td>S1.005</td><td>S1</td><td>258.614</td><td>-0.186</td><td>0.000</td><td>0.07</td><td></td><td></td><td>6.3</td><td>OK</td></tr><tr><td>S1.006</td><td>S2</td><td>257.769</td><td>-0.181</td><td>0.000</td><td>0.09</td><td></td><td></td><td>6.3</td><td>OK</td></tr><tr><td>S1.007</td><td>S3</td><td>257.463</td><td>-0.187</td><td>0.000</td><td>0.07</td><td></td><td></td><td>6.3</td><td>OK</td></tr><tr><td>S1.008</td><td>S3</td><td>256.976</td><td>-0.174</td><td>0.000</td><td>0.12</td><td></td><td></td><td>19.7</td><td>OK</td></tr><tr><td>S2.000</td><td>S4</td><td>250.949</td><td>-0.226</td><td>0.000</td><td>0.14</td><td></td><td></td><td>10.5</td><td>OK</td></tr><tr><td>S1.009</td><td>S5</td><td>250.868</td><td>-0.139</td><td>0.000</td><td>0.56</td><td></td><td></td><td>37.0</td><td>OK</td></tr><tr><td>S1.010</td><td>S6</td><td>250.641</td><td>-0.296</td><td>0.000</td><td>0.10</td><td></td><td></td><td>43.8</td><td>OK</td></tr><tr><td>S3.000</td><td>S7</td><td>248.719</td><td>-0.156</td><td>0.000</td><td>0.20</td><td></td><td></td><td>7.1</td><td>OK</td></tr><tr><td>S3.001</td><td>S8</td><td>248.500</td><td>-0.292</td><td>0.000</td><td>0.11</td><td></td><td></td><td>15.6</td><td>OK</td></tr><tr><td>S3.002</td><td>S9</td><td>248.264</td><td>-0.285</td><td>0.000</td><td>0.13</td><td></td><td></td><td>15.6</td><td>OK</td></tr><tr><td>S3.003</td><td>S10</td><td>248.169</td><td>-0.290</td><td>0.000</td><td>0.12</td><td></td><td></td><td>15.6</td><td>OK</td></tr><tr><td>S1.011</td><td>S11</td><td>248.051</td><td>-0.275</td><td>0.000</td><td>0.32</td><td></td><td></td><td>71.4</td><td>OK</td></tr><tr><td>S1.012</td><td>S12</td><td>247.917</td><td>-0.254</td><td>0.000</td><td>0.39</td><td></td><td></td><td>75.6</td><td>OK</td></tr><tr><td>S1.013</td><td>S13</td><td>247.738</td><td>-0.317</td><td>0.000</td><td>0.19</td><td></td><td></td><td>81.8</td><td>OK</td></tr><tr><td>S1.014</td><td>S14</td><td>247.003</td><td>-0.246</td><td>0.000</td><td>0.24</td><td></td><td></td><td>86.7</td><td>OK</td></tr><tr><td>S1.015</td><td>S15</td><td>247.000</td><td>0.097</td><td>0.000</td><td>0.38</td><td></td><td></td><td>95.6</td><td>SURCHARGED</td></tr><tr><td>S1.016</td><td>S16</td><td>247.000</td><td>0.550</td><td>0.000</td><td>0.03</td><td></td><td></td><td>1.4</td><td>SURCHARGED</td></tr></tbody></table>			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	S1.000	S1	262.933	-0.102	0.000	0.22			3.8	OK	S1.001	S2	262.558	-0.105	0.000	0.19			3.9	OK	S1.002	S3	262.184	-0.116	0.000	0.11			3.9	OK	S1.003	S4	261.476	-0.124	0.000	0.07			3.8	OK	S1.004	S5	259.977	-0.123	0.000	0.07			3.8	OK	S1.005	S1	258.614	-0.186	0.000	0.07			6.3	OK	S1.006	S2	257.769	-0.181	0.000	0.09			6.3	OK	S1.007	S3	257.463	-0.187	0.000	0.07			6.3	OK	S1.008	S3	256.976	-0.174	0.000	0.12			19.7	OK	S2.000	S4	250.949	-0.226	0.000	0.14			10.5	OK	S1.009	S5	250.868	-0.139	0.000	0.56			37.0	OK	S1.010	S6	250.641	-0.296	0.000	0.10			43.8	OK	S3.000	S7	248.719	-0.156	0.000	0.20			7.1	OK	S3.001	S8	248.500	-0.292	0.000	0.11			15.6	OK	S3.002	S9	248.264	-0.285	0.000	0.13			15.6	OK	S3.003	S10	248.169	-0.290	0.000	0.12			15.6	OK	S1.011	S11	248.051	-0.275	0.000	0.32			71.4	OK	S1.012	S12	247.917	-0.254	0.000	0.39			75.6	OK	S1.013	S13	247.738	-0.317	0.000	0.19			81.8	OK	S1.014	S14	247.003	-0.246	0.000	0.24			86.7	OK	S1.015	S15	247.000	0.097	0.000	0.38			95.6	SURCHARGED	S1.016	S16	247.000	0.550	0.000	0.03			1.4	SURCHARGED
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																																																																																																																																																																																																																															
S1.000	S1	262.933	-0.102	0.000	0.22			3.8	OK																																																																																																																																																																																																																															
S1.001	S2	262.558	-0.105	0.000	0.19			3.9	OK																																																																																																																																																																																																																															
S1.002	S3	262.184	-0.116	0.000	0.11			3.9	OK																																																																																																																																																																																																																															
S1.003	S4	261.476	-0.124	0.000	0.07			3.8	OK																																																																																																																																																																																																																															
S1.004	S5	259.977	-0.123	0.000	0.07			3.8	OK																																																																																																																																																																																																																															
S1.005	S1	258.614	-0.186	0.000	0.07			6.3	OK																																																																																																																																																																																																																															
S1.006	S2	257.769	-0.181	0.000	0.09			6.3	OK																																																																																																																																																																																																																															
S1.007	S3	257.463	-0.187	0.000	0.07			6.3	OK																																																																																																																																																																																																																															
S1.008	S3	256.976	-0.174	0.000	0.12			19.7	OK																																																																																																																																																																																																																															
S2.000	S4	250.949	-0.226	0.000	0.14			10.5	OK																																																																																																																																																																																																																															
S1.009	S5	250.868	-0.139	0.000	0.56			37.0	OK																																																																																																																																																																																																																															
S1.010	S6	250.641	-0.296	0.000	0.10			43.8	OK																																																																																																																																																																																																																															
S3.000	S7	248.719	-0.156	0.000	0.20			7.1	OK																																																																																																																																																																																																																															
S3.001	S8	248.500	-0.292	0.000	0.11			15.6	OK																																																																																																																																																																																																																															
S3.002	S9	248.264	-0.285	0.000	0.13			15.6	OK																																																																																																																																																																																																																															
S3.003	S10	248.169	-0.290	0.000	0.12			15.6	OK																																																																																																																																																																																																																															
S1.011	S11	248.051	-0.275	0.000	0.32			71.4	OK																																																																																																																																																																																																																															
S1.012	S12	247.917	-0.254	0.000	0.39			75.6	OK																																																																																																																																																																																																																															
S1.013	S13	247.738	-0.317	0.000	0.19			81.8	OK																																																																																																																																																																																																																															
S1.014	S14	247.003	-0.246	0.000	0.24			86.7	OK																																																																																																																																																																																																																															
S1.015	S15	247.000	0.097	0.000	0.38			95.6	SURCHARGED																																																																																																																																																																																																																															
S1.016	S16	247.000	0.550	0.000	0.03			1.4	SURCHARGED																																																																																																																																																																																																																															
©1982-2020 Innovyze																																																																																																																																																																																																																																								

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:53 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3

Summary of Results for 180 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	262.918	-0.117	0.000	0.11		1.9	OK
S1.001	S2	262.544	-0.119	0.000	0.09		1.9	OK
S1.002	S3	262.173	-0.127	0.000	0.06		1.9	OK
S1.003	S4	261.468	-0.132	0.000	0.03		1.9	OK
S1.004	S5	259.968	-0.132	0.000	0.04		1.9	OK
S1.005	S1	258.602	-0.198	0.000	0.03		3.1	OK
S1.006	S2	257.755	-0.195	0.000	0.04		3.1	OK
S1.007	S3	257.451	-0.199	0.000	0.03		3.1	OK
S1.008	S3	256.960	-0.190	0.000	0.06		9.8	OK
S2.000	S4	250.925	-0.250	0.000	0.07		5.2	OK
S1.009	S5	250.814	-0.193	0.000	0.28		18.3	OK
S1.010	S6	250.615	-0.322	0.000	0.05		21.7	OK
S3.000	S7	248.697	-0.178	0.000	0.10		3.5	OK
S3.001	S8	248.473	-0.319	0.000	0.05		7.7	OK
S3.002	S9	248.236	-0.313	0.000	0.07		7.7	OK
S3.003	S10	248.142	-0.317	0.000	0.06		7.7	OK
S1.011	S11	247.996	-0.330	0.000	0.16		35.3	OK
S1.012	S12	247.856	-0.315	0.000	0.20		37.5	OK
S1.013	S13	247.698	-0.357	0.000	0.09		40.8	OK
S1.014	S14	247.074	-0.175	0.000	0.12		43.1	OK
S1.015	S15	247.072	0.169	0.000	0.19		47.7	SURCHARGED
S1.016	S16	247.072	0.622	0.000	0.03		1.4	SURCHARGED

Cadsquare Midlands Ltd

The Stables
Woodbury Lane, Norton
Worcester WR5 2PT

Date 23/02/2022 15:54
File Storm network - Rev C.MDX

WERRINGTON
STORM NETWORK
21-081 / 601b

Designed by SCH
Checked by

Micro Drainage

Network 2020.1.3

Page 1



Summary of Results for 360 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm)300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS StatusON

DVD StatusOFF

Inertia StatusOFF

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
S1.000	S1	262.910	-0.125	0.000	0.07			1.2	OK
S1.001	S2	262.536	-0.127	0.000	0.06			1.2	OK
S1.002	S3	262.168	-0.132	0.000	0.03			1.2	OK
S1.003	S4	261.465	-0.135	0.000	0.02			1.2	OK
S1.004	S5	259.965	-0.135	0.000	0.02			1.2	OK
S1.005	S1	258.598	-0.202	0.000	0.02			1.9	OK
S1.006	S2	257.749	-0.201	0.000	0.03			1.9	OK
S1.007	S3	257.447	-0.203	0.000	0.02			1.9	OK
S1.008	S3	256.952	-0.198	0.000	0.04			6.1	OK
S2.000	S4	250.914	-0.261	0.000	0.04			3.2	OK
S1.009	S5	250.790	-0.217	0.000	0.17			11.4	OK
S1.010	S6	250.605	-0.332	0.000	0.03			13.5	OK
S3.000	S7	248.686	-0.189	0.000	0.06			2.2	OK
S3.001	S8	248.462	-0.330	0.000	0.03			4.8	OK
S3.002	S9	248.222	-0.327	0.000	0.04			4.8	OK
S3.003	S10	248.130	-0.329	0.000	0.04			4.8	OK
S1.011	S11	247.970	-0.356	0.000	0.10			21.9	OK
S1.012	S12	247.825	-0.346	0.000	0.12			23.3	OK
S1.013	S13	247.675	-0.380	0.000	0.06			25.3	OK
S1.014	S14	247.119	-0.130	0.000	0.07			26.7	OK
S1.015	S15	247.119	0.215	0.000	0.12			29.6	SURCHARGED
S1.016	S16	247.119	0.669	0.000	0.03			1.4	SURCHARGED

©1982-2020 Innovyze

Cadsquare Midlands Ltd

Page 1

The Stables
Woodbury Lane, Norton
Worcester WR5 2PT

WERRINGTON
STORM NETWORK
21-081 / 601b

Date 23/02/2022 15:55
File Storm network - Rev C.MDX

Designed by SCH
Checked by

Micro Drainage

Network 2020.1.3

Micro Drainage

Summary of Results for 600 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm)300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS StatusON

DVD StatusOFF

Inertia StatusOFF

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
S1.000	S1	262.906	-0.129	0.000	0.05			0.8	OK
S1.001	S2	262.532	-0.131	0.000	0.04			0.8	OK
S1.002	S3	262.166	-0.134	0.000	0.02			0.8	OK
S1.003	S4	261.461	-0.139	0.000	0.01			0.8	OK
S1.004	S5	259.961	-0.139	0.000	0.02			0.8	OK
S1.005	S1	258.591	-0.209	0.000	0.01			1.3	OK
S1.006	S2	257.744	-0.206	0.000	0.02			1.3	OK
S1.007	S3	257.440	-0.210	0.000	0.01			1.3	OK
S1.008	S3	256.949	-0.201	0.000	0.02			4.2	OK
S2.000	S4	250.908	-0.267	0.000	0.03			2.2	OK
S1.009	S5	250.776	-0.231	0.000	0.12			7.9	OK
S1.010	S6	250.599	-0.338	0.000	0.02			9.4	OK
S3.000	S7	248.680	-0.195	0.000	0.04			1.5	OK
S3.001	S8	248.456	-0.336	0.000	0.02			3.3	OK
S3.002	S9	248.215	-0.334	0.000	0.03			3.3	OK
S3.003	S10	248.124	-0.335	0.000	0.03			3.3	OK
S1.011	S11	247.953	-0.373	0.000	0.07			15.3	OK
S1.012	S12	247.808	-0.363	0.000	0.08			16.2	OK
S1.013	S13	247.663	-0.392	0.000	0.04			17.6	OK
S1.014	S14	247.148	-0.101	0.000	0.05			18.6	OK
S1.015	S15	247.148	0.245	0.000	0.08			20.8	SURCHARGED
S1.016	S16	247.148	0.698	0.000	0.03			1.5	SURCHARGED

©1982-2020 Innovyze

Cadsquare Midlands Ltd		Page 1
The Stables Woodbury Lane, Norton Worcester WR5 2PT	WERRINGTON STORM NETWORK 21-081 / 601b	
Date 23/02/2022 15:55 File Storm network - Rev C.MDX	Designed by SCH Checked by	
Micro Drainage		Network 2020.1.3

Summary of Results for 1440 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	262.901	-0.134	0.000	0.03		0.4	OK
S1.001	S2	262.528	-0.135	0.000	0.02		0.4	OK
S1.002	S3	262.159	-0.141	0.000	0.01		0.4	OK
S1.003	S4	261.456	-0.144	0.000	0.01		0.4	OK
S1.004	S5	259.956	-0.144	0.000	0.01		0.4	OK
S1.005	S1	258.584	-0.216	0.000	0.01		0.7	OK
S1.006	S2	257.735	-0.215	0.000	0.01		0.7	OK
S1.007	S3	257.433	-0.217	0.000	0.01		0.7	OK
S1.008	S3	256.939	-0.211	0.000	0.01		2.3	OK
S2.000	S4	250.897	-0.278	0.000	0.02		1.2	OK
S1.009	S5	250.756	-0.251	0.000	0.06		4.2	OK
S1.010	S6	250.582	-0.355	0.000	0.01		5.0	OK
S3.000	S7	248.673	-0.202	0.000	0.02		0.8	OK
S3.001	S8	248.439	-0.353	0.000	0.01		1.8	OK
S3.002	S9	248.201	-0.348	0.000	0.02		1.8	OK
S3.003	S10	248.108	-0.351	0.000	0.01		1.8	OK
S1.011	S11	247.932	-0.394	0.000	0.04		8.2	OK
S1.012	S12	247.782	-0.389	0.000	0.05		8.7	OK
S1.013	S13	247.651	-0.404	0.000	0.02		9.4	OK
S1.014	S14	247.175	-0.074	0.000	0.03		10.0	OK
S1.015	S15	247.175	0.271	0.000	0.04		11.2	SURCHARGED
S1.016	S16	247.175	0.725	0.000	0.03		1.5	SURCHARGED