

9 Joyce Way  
Whitchurch  
Shropshire SY13 1TZ

The Gran Farm, Newcastle  
1 in 100 + 25% cc Sim



Date 01/06/2021  
File 1 in 100 + 25% cc Sim.MDX

Designed by ag  
Checked by

Micro Drainage Network 2018.1.1

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	9.050	0.023	393.5	0.006	2.00	0.600	o	225	Pipe/Conduit
1.001	26.000	0.065	400.0	0.016	0.00	0.600	o	225	Pipe/Conduit
1.002	29.250	0.612	47.8	0.000	0.00	0.600	o	150	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	1	226.500	225.700	0.575	226.500	225.677	0.598		1200
1.001	2	226.500	225.677	0.598	226.500	225.612	0.663		1200
1.002	3	226.500	225.612	0.738	226.000	225.000	0.850	Hydro-Brake®	1200

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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	225	1	226.500	225.700	0.575	Open Manhole	1200
1.001	o	225	2	226.500	225.677	0.598	Open Manhole	1200
1.002	o	150	3	226.500	225.612	0.738	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	9.050	393.5	2	226.500	225.677	0.598	Open Manhole	1200
1.001	26.000	400.0	3	226.500	225.612	0.663	Open Manhole	1200
1.002	29.250	47.8		226.000	225.000	0.850	Open Manhole	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)
1.002		226.000	225.000	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	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	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	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.300	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm


Hydro-Brake® Optimum Manhole: 3, DS/PN: 1.002, Volume (m³): 2.0

Unit Reference	MD-SHE-0114-5000-0350-5000
Design Head (m)	0.350
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	114
Invert Level (m)	225.612
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.350	5.0
Flush-Flo™	0.166	5.0
Kick-Flo®	0.283	4.5
Mean Flow over Head Range	-	3.9

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	4.0	1.200	8.9	3.000	13.7	7.000	20.8
0.200	5.0	1.400	9.6	3.500	14.8	7.500	21.6
0.300	4.7	1.600	10.2	4.000	15.7	8.000	22.3
0.400	5.3	1.800	10.8	4.500	16.7	8.500	23.0
0.500	5.9	2.000	11.3	5.000	17.6	9.000	23.6
0.600	6.4	2.200	11.8	5.500	18.4	9.500	24.3
0.800	7.3	2.400	12.3	6.000	19.3		
1.000	8.2	2.600	12.8	6.500	20.1		

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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 \* 10m<sup>3</sup>/ha Storage 0.000  
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 0.400  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)                      18.300 Cv (Winter) 0.840

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

Profile(s)                      Summer and Winter  
Duration(s) (mins)                      15, 30, 60, 120, 180, 240, 360, 480, 600,  
720, 960, 1440  
Return Period(s) (years)                      1, 30, 100  
Climate Change (%)                      25, 25, 25

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	100	+25%	100/15 Winter				225.966
1.001	2	15 Winter	100	+25%	100/15 Summer				225.965
1.002	3	15 Winter	100	+25%	30/15 Summer				225.952

PN	US/MH Name	Surcharged Flooded			Pipe		Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Flow / Overflow (l/s)	Flow (l/s)		
1.000	1	0.041	0.000	0.17		3.2	SURCHARGED	
1.001	2	0.063	0.000	0.42		9.9	SURCHARGED	
1.002	3	0.190	0.000	0.20		5.0	SURCHARGED	