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Date 03/08/2016 15:53 File SW Network.mdx	Designed by andrew.ivey Checked by	
Micro Drainage Network 2016.1		

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
* S1.000	3.093	0.300	10.3	0.298	5.00	0.600	o	300	Pipe/Conduit
* S2.000	10.855	0.300	36.2	0.292	5.00	0.600	o	300	Pipe/Conduit
* S3.000	31.377	0.300	104.6	0.023	5.00	0.600	o	150	Pipe/Conduit
* S1.001	17.809	0.100	178.1	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.002	10.972	0.200	54.9	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.003	30.588	0.300	102.0	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.004	29.018	0.190	152.7	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.005	49.245	0.330	149.2	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.006	10.728	0.480	22.4	0.000	0.00	0.600	o	150	Pipe/Conduit
* S1.007	2.020	0.050	40.4	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)
* S1.000	CPMH01	30.550	28.500	1.750	30.550	28.200	2.050		1200
* S2.000	CPMH02	30.550	28.500	1.750	30.550	28.200	2.050		1200
* S3.000	CHANNEL DRAIN	29.300	28.500	0.650	30.550	28.200	2.200		1200
* S1.001	ATTENUATION	30.550	28.200	2.200	30.550	28.100	2.300		1200
* S1.002	SWMH01	30.550	28.100	2.300	28.500	27.900	0.450	Complex	1200
* S1.003	SWMH02	28.500	27.900	0.450	28.200	27.600	0.450		475
* S1.004	SWMH03	28.200	27.600	0.450	28.010	27.410	0.450		475
* S1.005	SWMH04	28.010	27.410	0.450	27.750	27.080	0.520		475
* S1.006	SWMH05	27.750	27.080	0.520	27.200	26.600	0.450		475
* S1.007	SWMH06	27.200	26.600	0.450	27.000	26.550	0.300		475

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)
S1.007	S	27.000	26.550	0.000	0	0

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<u>Simulation Criteria for Storm</u> Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000 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 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> 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) 18.000 Storm Duration (mins) 30 Ratio R 0.350		
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Online Controls for Storm

Complex Manhole: SSWMH01, DS/PN: S1.002, Volume (m³): 3.1

Hydro-Brake Optimum®

Unit Reference	MD-SHE-0106-5200-1100-5200
Design Head (m)	1.100
Design Flow (l/s)	5.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	106
Invert Level (m)	28.100
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	5.2
Flush-Flo™	0.325	5.2
Kick-Flo®	0.693	4.2
Mean Flow over Head Range	-	4.5

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	3.6	1.200	5.4	3.000	8.3	7.000	12.4
0.200	5.0	1.400	5.8	3.500	8.9	7.500	12.9
0.300	5.2	1.600	6.2	4.000	9.5	8.000	13.3
0.400	5.2	1.800	6.5	4.500	10.1	8.500	13.6
0.500	5.0	2.000	6.9	5.000	10.6	9.000	14.0
0.600	4.8	2.200	7.2	5.500	11.1	9.500	14.4
0.800	4.5	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.0		

Hydro-Brake Optimum®

Unit Reference	MD-SHE-0132-7000-0325-7000
Design Head (m)	0.325
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	132
Invert Level (m)	28.875

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Hydro-Brake Optimum®

Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.325	7.0
Flush-Flo™	0.184	7.0
Kick-Flo®	0.278	6.5
Mean Flow over Head Range	–	5.2

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	4.8	1.200	12.9	3.000	20.0	7.000	30.4
0.200	7.0	1.400	13.9	3.500	21.4	7.500	31.5
0.300	6.7	1.600	14.8	4.000	22.9	8.000	32.6
0.400	7.7	1.800	15.7	4.500	24.3	8.500	33.6
0.500	8.6	2.000	16.5	5.000	25.7	9.000	34.5
0.600	9.3	2.200	17.3	5.500	26.9	9.500	35.5
0.800	10.7	2.400	18.0	6.000	28.2		
1.000	11.9	2.600	18.7	6.500	29.3		

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Storage Structures for Storm

Cellular Storage Manhole: SATTENUATION, DS/PN: S1.001

Invert Level (m) 28.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	240.0	240.0	1.100	0.0	308.0
1.000	240.0	308.0			

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status
			Level (m)	Depth (m)	Volume (m ³)			Flow (l/s)	
S3.000	SCHANNEL DRAIN		29.211	0.561	0.000	0.11		1.8	FLOOD RISK
S1.001	SATTENUATION		29.208	0.858	0.000	0.97		12.0	SURCHARGED
S1.002	SSWMH01		29.117	0.867	0.000	0.55		11.9	SURCHARGED
S1.003	SSWMH02		27.993	-0.057	0.000	0.70		11.9	OK
S1.004	SSWMH03		27.708	-0.042	0.000	0.87		11.9	OK
S1.005	SSWMH04		27.516	-0.044	0.000	0.84		11.9	OK
S1.006	SSWMH05		27.141	-0.089	0.000	0.35		11.9	OK
S1.007	SSWMH06		26.706	-0.044	0.000	0.85		11.9	OK

PN	US/MH Name	Level Exceeded
S1.000	SCPMH01	
S2.000	SCPMH02	
S3.000	SCHANNEL DRAIN	
S1.001	SATTENUATION	
S1.002	SSWMH01	
S1.003	SSWMH02	
S1.004	SSWMH03	
S1.005	SSWMH04	
S1.006	SSWMH05	
S1.007	SSWMH06	