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1 Malin Hill Nottingham NG1 1JQ	MA11495-DD-R02 Hinkley Square SWS Design	
Date 22/08/2025 File MA12204-SWS-PL-R03 FEH ...	Designed by JMcK Checked by	
XP Solutions Network 2020.1.3		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	1999
Site Location GB 442350 293550 SP 42350 93550	
C (1km)	-0.028
D1 (1km)	0.372
D2 (1km)	0.337
D3 (1km)	0.270
E (1km)	0.307
F (1km)	2.343
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
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)
0-4	0.239	4-8	0.121

Total Area Contributing (ha) = 0.360

Total Pipe Volume (m³) = 9.005

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
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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)
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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	
S1.000	10.857	0.250	43.4	0.087	5.00	0.0	0.600	o	150	Pipe/Conduit		
S1.001	26.664	0.070	380.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S2.000	21.248	0.270	78.7	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit		
S3.000	6.832	0.070	97.6	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit		
S2.001	15.415	0.160	96.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S4.000	7.239	0.080	90.5	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit		
S2.002	12.450	0.130	95.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S2.003	5.773	0.060	96.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S5.000	30.700	0.770	39.9	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit		
S1.002	16.798	0.160	105.0	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.003	22.687	0.120	189.1	0.088	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.000	18.289	1.080	16.9	0.057	5.00	0.0	0.600	o	150	Pipe/Conduit		
S6.001	17.108	0.170	100.6	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)	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)		
S1.000	0.00	5.12	114.600	0.087	0.0	0.0	0.0	1.53	27.1	0.0		
S1.001	0.00	5.67	114.350	0.087	0.0	0.0	0.0	0.80	56.5	0.0		
S2.000	0.00	5.31	114.900	0.016	0.0	0.0	0.0	1.13	20.0	0.0		
S3.000	0.00	5.11	114.700	0.019	0.0	0.0	0.0	1.02	18.0	0.0		
S2.001	0.00	5.56	114.630	0.035	0.0	0.0	0.0	1.02	18.1	0.0		
S4.000	0.00	5.15	114.600	0.000	0.0	0.0	0.0	0.81	6.4	0.0		
S2.002	0.00	5.77	114.470	0.035	0.0	0.0	0.0	1.03	18.1	0.0		
S2.003	0.00	5.86	114.340	0.035	0.0	0.0	0.0	1.02	18.1	0.0		
S5.000	0.00	5.32	115.200	0.033	0.0	0.0	0.0	1.60	28.3	0.0		
S1.002	0.00	6.04	114.280	0.215	0.0	0.0	0.0	1.53	108.4	0.0		
S1.003	0.00	6.37	114.120	0.303	0.0	0.0	0.0	1.14	80.6	0.0		
S6.000	0.00	5.12	115.250	0.057	0.0	0.0	0.0	2.46	43.5	0.0		
S6.001	0.00	5.41	114.170	0.057	0.0	0.0	0.0	1.00	17.7	0.0		
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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
S1.004	7.927	1.800	4.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	13.513	0.044	307.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	4.338	0.096	45.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

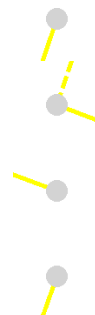
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.004	0.00	6.39	112.000	0.360	0.0	0.0	0.0	7.54	533.0	0.0
S1.005	0.00	6.64	110.200	0.360	0.0	0.0	0.0	0.89	63.0	0.0
S1.006	0.00	6.67	110.156	0.360	0.0	0.0	0.0	2.35	165.8	0.0

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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)	Backd (mm)
Smhs02	116.600	2.000	Open Manhole	1500	S1.000	114.600	150				
Smhs03	116.200	1.850	Open Manhole	1200	S1.001	114.350	300	S1.000	114.350	150	
Smhs04	115.350	0.450	Open Manhole	1200	S2.000	114.900	150				
Smhs05	115.350	0.650	Open Manhole	1200	S3.000	114.700	150				
Smhs06	115.350	0.720	Open Manhole	1200	S2.001	114.630	150	S2.000	114.630	150	
								S3.000	114.630	150	
Smhs07	115.350	0.750	Open Manhole	1200	S4.000	114.600	100				
Smhs08	115.350	0.880	Open Manhole	1200	S2.002	114.470	150	S2.001	114.470	150	
								S4.000	114.520	100	
Smhs09	116.200	1.860	Open Manhole	1200	S2.003	114.340	150	S2.002	114.340	150	
Smhs10	116.200	1.000	Open Manhole	1200	S5.000	115.200	150				
Smhs11	116.200	1.920	Open Manhole	1500	S1.002	114.280	300	S1.001	114.280	300	
								S2.003	114.280	150	
								S5.000	114.430	150	
Smhs12	116.000	1.880	Open Manhole	1500	S1.003	114.120	300	S1.002	114.120	300	
Smhs13	116.250	1.000	Open Manhole	1200	S6.000	115.250	150				
Smhs14	115.500	1.330	Open Manhole	1200	S6.001	114.170	150	S6.000	114.170	150	
Smhs15	115.500	3.500	Open Manhole	1200	S1.004	112.000	300	S1.003	114.000	300	20
								S6.001	114.000	150	18
Smhs16	111.800	1.600	Open Manhole	1500	S1.005	110.200	300	S1.004	110.200	300	
Smhs17	111.700	1.544	Open Manhole	2100	S1.006	110.156	300	S1.005	110.156	300	
SOutfall	110.570	0.510	Open Manhole	1200		OUTFALL		S1.006	110.060	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Smhs02	983.117	1077.780	983.117	1077.780	Required	
Smhs03	979.645	1067.493	979.645	1067.493	Required	
Smhs04	1051.411	1054.828	1051.411	1054.828	Required	
Smhs05	1033.748	1068.677	1033.748	1068.677	Required	



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NG1 1JQ

MA11495-DD-R02
Hinkley Square
SWS Design



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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Smhs06	1031.493	1062.228	1031.493	1062.228	Required	
Smhs07	1020.438	1076.077	1020.438	1076.077	Required	
Smhs08	1017.812	1069.331	1017.812	1069.331	Required	
Smhs09	1006.956	1063.237	1006.956	1063.237	Required	
Smhs10	1032.440	1045.141	1032.440	1045.141	Required	
Smhs11	1004.557	1057.986	1004.557	1057.986	Required	
Smhs12	997.954	1042.541	997.954	1042.541	Required	
Smhs13	1012.921	1032.315	1012.921	1032.315	Required	
Smhs14	1006.360	1015.243	1006.360	1015.243	Required	
Smhs15	990.315	1021.179	990.315	1021.179	Required	
Smhs16	987.525	1013.759	987.525	1013.759	Required	
Smhs17	996.731	1003.868	996.731	1003.868	Required	
SOutfall	993.837	1000.636			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)
S1.000	o	150	Smhs02	116.600	114.600	1.850	Open Manhole	1500
S1.001	o	300	Smhs03	116.200	114.350	1.550	Open Manhole	1200
S2.000	o	150	Smhs04	115.350	114.900	0.300	Open Manhole	1200
S3.000	o	150	Smhs05	115.350	114.700	0.500	Open Manhole	1200
S2.001	o	150	Smhs06	115.350	114.630	0.570	Open Manhole	1200
S4.000	o	100	Smhs07	115.350	114.600	0.650	Open Manhole	1200
S2.002	o	150	Smhs08	115.350	114.470	0.730	Open Manhole	1200
S2.003	o	150	Smhs09	116.200	114.340	1.710	Open Manhole	1200
S5.000	o	150	Smhs10	116.200	115.200	0.850	Open Manhole	1200
S1.002	o	300	Smhs11	116.200	114.280	1.620	Open Manhole	1500
S1.003	o	300	Smhs12	116.000	114.120	1.580	Open Manhole	1500
S6.000	o	150	Smhs13	116.250	115.250	0.850	Open Manhole	1200
S6.001	o	150	Smhs14	115.500	114.170	1.180	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)
S1.000	10.857	43.4	Smhs03	116.200	114.350	1.700	Open Manhole	1200
S1.001	26.664	380.9	Smhs11	116.200	114.280	1.620	Open Manhole	1500
S2.000	21.248	78.7	Smhs06	115.350	114.630	0.570	Open Manhole	1200
S3.000	6.832	97.6	Smhs06	115.350	114.630	0.570	Open Manhole	1200
S2.001	15.415	96.3	Smhs08	115.350	114.470	0.730	Open Manhole	1200
S4.000	7.239	90.5	Smhs08	115.350	114.520	0.730	Open Manhole	1200
S2.002	12.450	95.8	Smhs09	116.200	114.340	1.710	Open Manhole	1200
S2.003	5.773	96.2	Smhs11	116.200	114.280	1.770	Open Manhole	1500
S5.000	30.700	39.9	Smhs11	116.200	114.430	1.620	Open Manhole	1500
S1.002	16.798	105.0	Smhs12	116.000	114.120	1.580	Open Manhole	1500
S1.003	22.687	189.1	Smhs15	115.500	114.000	1.200	Open Manhole	1200
S6.000	18.289	16.9	Smhs14	115.500	114.170	1.180	Open Manhole	1200
S6.001	17.108	100.6	Smhs15	115.500	114.000	1.350	Open Manhole	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)
S1.004	o	300	Smhs15	115.500	112.000	3.200	Open Manhole	1200
S1.005	o	300	Smhs16	111.800	110.200	1.300	Open Manhole	1500
S1.006	o	300	Smhs17	111.700	110.156	1.244	Open Manhole	2100

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)
S1.004	7.927	4.4	Smhs16	111.800	110.200	1.300	Open Manhole	1500
S1.005	13.513	307.1	Smhs17	111.700	110.156	1.244	Open Manhole	2100
S1.006	4.338	45.2	SOutfall	110.570	110.060	0.210	Open Manhole	1200

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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	User	-	100	0.003	0.003	0.003
	User	-	100	0.004	0.004	0.007
	User	-	100	0.006	0.006	0.014
	User	-	100	0.004	0.004	0.018
	User	-	100	0.069	0.069	0.087
1.001	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.016	0.016	0.016
3.000	User	-	100	0.019	0.019	0.019
2.001	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.000	0.000	0.000
5.000	User	-	100	0.033	0.033	0.033
1.002	User	-	100	0.057	0.057	0.057
	User	-	100	0.004	0.004	0.061
1.003	User	-	100	0.088	0.088	0.088
6.000	User	-	100	0.040	0.040	0.040
	User	-	100	0.017	0.017	0.057
6.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.360	0.360	0.360

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)
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S1.006	SOutfall1	110.570	110.060	10.060	1200	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.700	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: Smhs12, DS/PN: S1.003, Volume (m³): 4.4

Unit Reference	MD-SHE-0200-2300-1800-2300
Design Head (m)	1.800
Design Flow (l/s)	23.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	200
Invert Level (m)	114.120
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	23.0
Flush-Flo™	0.527	23.0
Kick-Flo®	1.140	18.5
Mean Flow over Head Range	-	19.9

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	6.9	1.200	19.0	3.000	29.4	7.000	44.2
0.200	18.8	1.400	20.4	3.500	31.6	7.500	45.7
0.300	21.8	1.600	21.7	4.000	33.7	8.000	47.1
0.400	22.7	1.800	23.0	4.500	35.7	8.500	48.5
0.500	23.0	2.000	24.2	5.000	37.5	9.000	49.9
0.600	22.9	2.200	25.3	5.500	39.3	9.500	51.2
0.800	22.3	2.400	26.4	6.000	41.0		
1.000	20.8	2.600	27.4	6.500	42.6		

Hydro-Brake® Optimum Manhole: Smhs17, DS/PN: S1.006, Volume (m³): 6.2

Unit Reference	MD-SCU-0149-2530-1300-2530
Design Head (m)	1.300
Design Flow (l/s)	25.3
Flush-Flo™	Calculated
Objective	Linear discharge profile
Application	Surface
Sump Available	Yes
Diameter (mm)	149
Invert Level (m)	110.156
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

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<u>Hydro-Brake® Optimum Manhole: Smhs17, DS/PN: S1.006, Volume (m³): 6.2</u> <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.300</td><td>25.3</td></tr><tr><td>Flush-Flo™</td><td>0.179</td><td>11.2</td></tr><tr><td>Kick-Flo®</td><td>0.223</td><td>11.0</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>17.0</td></tr></tbody></table> 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 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>5.9</td><td>1.200</td><td>24.3</td><td>3.000</td><td>37.8</td><td>7.000</td><td>57.1</td></tr><tr><td>0.200</td><td>11.2</td><td>1.400</td><td>26.2</td><td>3.500</td><td>40.8</td><td>7.500</td><td>59.0</td></tr><tr><td>0.300</td><td>12.6</td><td>1.600</td><td>27.9</td><td>4.000</td><td>43.5</td><td>8.000</td><td>60.9</td></tr><tr><td>0.400</td><td>14.4</td><td>1.800</td><td>29.6</td><td>4.500</td><td>46.0</td><td>8.500</td><td>62.7</td></tr><tr><td>0.500</td><td>16.0</td><td>2.000</td><td>31.1</td><td>5.000</td><td>48.5</td><td>9.000</td><td>64.5</td></tr><tr><td>0.600</td><td>17.5</td><td>2.200</td><td>32.6</td><td>5.500</td><td>50.7</td><td>9.500</td><td>66.2</td></tr><tr><td>0.800</td><td>20.1</td><td>2.400</td><td>34.0</td><td>6.000</td><td>52.9</td><td></td><td></td></tr><tr><td>1.000</td><td>22.3</td><td>2.600</td><td>35.3</td><td>6.500</td><td>55.0</td><td></td><td></td></tr></tbody></table>			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.300	25.3	Flush-Flo™	0.179	11.2	Kick-Flo®	0.223	11.0	Mean Flow over Head Range	-	17.0	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.9	1.200	24.3	3.000	37.8	7.000	57.1	0.200	11.2	1.400	26.2	3.500	40.8	7.500	59.0	0.300	12.6	1.600	27.9	4.000	43.5	8.000	60.9	0.400	14.4	1.800	29.6	4.500	46.0	8.500	62.7	0.500	16.0	2.000	31.1	5.000	48.5	9.000	64.5	0.600	17.5	2.200	32.6	5.500	50.7	9.500	66.2	0.800	20.1	2.400	34.0	6.000	52.9			1.000	22.3	2.600	35.3	6.500	55.0		
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Storage Structures for Storm

Complex Manhole: Smhs11, DS/PN: S1.002

Cellular Storage

Invert Level (m) 114.000 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	273.0	273.0	0.401	0.0	300.2
0.400	273.0	300.2			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 14.5
Membrane Percolation (mm/hr) 1000 Length (m) 35.0
Max Percolation (l/s) 141.0 Slope (1:X) 500.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 115.600 Membrane Depth (mm) 0

Cellular Storage Manhole: Smhs17, DS/PN: S1.006

Invert Level (m) 110.156 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	44.0	44.0	0.801	0.0	68.0
0.800	44.0	68.0			

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1 year Return Period Summary of Critical Results by Maximum Outflow (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 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 2

Number of Online Controls 2

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) 1.000

M5-60 (mm)

19.800 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

ON

Inertia Status

ON

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, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	Smhs02	15 Summer	1	+0%	30/15 Summer			
S1.001	Smhs03	15 Summer	1	+0%	100/15 Summer			
S2.000	Smhs04	15 Summer	1	+0%	100/15 Summer			
S3.000	Smhs05	15 Summer	1	+0%	30/15 Summer			
S2.001	Smhs06	15 Summer	1	+0%	30/15 Summer			
S4.000	Smhs07	15 Summer	1	+0%	100/15 Summer			
S2.002	Smhs08	15 Summer	1	+0%	30/15 Summer			
S2.003	Smhs09	15 Summer	1	+0%	30/15 Summer			
S5.000	Smhs10	15 Summer	1	+0%				
S1.002	Smhs11	10080 Summer	1	+0%	100/60 Summer			
S1.003	Smhs12	15 Summer	1	+0%	30/15 Summer			
S6.000	Smhs13	15 Summer	1	+0%	30/15 Summer			
S6.001	Smhs14	15 Summer	1	+0%	30/15 Summer			
S1.004	Smhs15	15 Summer	1	+0%				
S1.005	Smhs16	15 Summer	1	+0%	30/15 Summer			
S1.006	Smhs17	30 Summer	1	+0%	30/15 Summer			

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Network 2020.1.3

Micro Drainage

30 year Return Period Summary of Critical Results by Maximum Outflow (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 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 2

Number of Online Controls 2

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) 1.000

M5-60 (mm)

19.800 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)

300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

ON

DVD Status

ON

Inertia Status

ON

Profile(s)

Duration(s) (mins)

Return Period(s) (years)

Climate Change (%)

Summer and Winter

15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

1, 30, 100

0, 35, 40

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

S1.000

Smhs02

15 Summer

30

+35%

30/15 Summer

S1.001

Smhs03

15 Summer

30

+35%

100/15 Summer

S2.000

Smhs04

15 Summer

30

+35%

100/15 Summer

S3.000

Smhs05

15 Summer

30

+35%

30/15 Summer

S2.001

Smhs06

15 Summer

30

+35%

30/15 Summer

S4.000

Smhs07

15 Summer

30

+35%

100/15 Summer

S2.002

Smhs08

15 Summer

30

+35%

30/15 Summer

S2.003

Smhs09

15 Summer

30

+35%

30/15 Summer

S5.000

Smhs10

15 Summer

30

+35%

S1.002

Smhs11

360 Summer

30

+35%

100/60 Summer

S1.003

Smhs12

15 Summer

30

+35%

30/15 Summer

S6.000

Smhs13

15 Summer

30

+35%

30/15 Summer

S6.001

Smhs14

15 Summer

30

+35%

30/15 Summer

S1.004

Smhs15

15 Summer

30

+35%

S1.005

Smhs16

15 Summer

30

+35%

30/15 Summer

S1.006

Smhs17

60 Winter

30

+35%

30/15 Summer

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XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	Smhs02	115.561	0.811	0.000	1.96		47.5	SURCHARGED
S1.001	Smhs03	114.580	-0.070	0.000	0.94		47.7	OK
S2.000	Smhs04	114.975	-0.075	0.000	0.49		9.2	OK
S3.000	Smhs05	114.865	0.015	0.000	0.66		10.0	SURCHARGED
S2.001	Smhs06	114.834	0.054	0.000	1.08		18.1	SURCHARGED
S4.000	Smhs07	114.634	-0.066	0.000	0.06		0.3	OK
S2.002	Smhs08	114.651	0.031	0.000	1.06		17.4	SURCHARGED
S2.003	Smhs09	114.505	0.015	0.000	1.17		17.5	SURCHARGED
S5.000	Smhs10	115.293	-0.057	0.000	0.70		18.9	OK
S1.002	Smhs11	114.348	-0.232	0.000	0.12		11.0	OK
S1.003	Smhs12	114.653	0.233	0.000	0.32		22.9	SURCHARGED
S6.000	Smhs13	115.432	0.032	0.000	0.79		31.9	SURCHARGED
S6.001	Smhs14	114.770	0.450	0.000	1.92		31.6	SURCHARGED
S1.004	Smhs15	112.080	-0.220	0.000	0.16		54.4	OK
S1.005	Smhs16	110.613	0.113	0.000	1.05		53.9	SURCHARGED
S1.006	Smhs17	110.726	0.270	0.000	0.22	33	17.1	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	Smhs02	
S1.001	Smhs03	
S2.000	Smhs04	
S3.000	Smhs05	
S2.001	Smhs06	
S4.000	Smhs07	
S2.002	Smhs08	
S2.003	Smhs09	
S5.000	Smhs10	
S1.002	Smhs11	
S1.003	Smhs12	
S6.000	Smhs13	
S6.001	Smhs14	
S1.004	Smhs15	
S1.005	Smhs16	
S1.006	Smhs17	

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Micro
Drainage

100 year Return Period Summary of Critical Results by Maximum Outflow (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 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 2

Number of Online Controls 2

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) 1.000

M5-60 (mm) 19.800 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

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, 35, 40

PN

US/MH Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

S1.000

Smhs02

15 Summer

100

+40%

30/15 Summer

S1.001

Smhs03

15 Summer

100

+40%

100/15 Summer

S2.000

Smhs04

15 Summer

100

+40%

100/15 Summer

S3.000

Smhs05

15 Summer

100

+40%

30/15 Summer

S2.001

Smhs06

15 Summer

100

+40%

30/15 Summer

S4.000

Smhs07

15 Summer

100

+40%

100/15 Summer

S2.002

Smhs08

15 Summer

100

+40%

30/15 Summer

S2.003

Smhs09

15 Summer

100

+40%

30/15 Summer

S5.000

Smhs10

15 Summer

100

+40%

S1.002

Smhs11

60 Summer

100

+40%

100/60 Summer

S1.003

Smhs12

60 Summer

100

+40%

30/15 Summer

S6.000

Smhs13

15 Summer

100

+40%

30/15 Summer

S6.001

Smhs14

15 Summer

100

+40%

30/15 Summer

S1.004

Smhs15

15 Summer

100

+40%

S1.005

Smhs16

15 Summer

100

+40%

30/15 Summer

S1.006

Smhs17

120 Winter

100

+40%

30/15 Summer

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100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	Smhs02	116.348	1.598	0.000	2.53		61.5	FLOOD RISK
S1.001	Smhs03	114.671	0.021	0.000	1.22		62.0	SURCHARGED
S2.000	Smhs04	115.113	0.063	0.000	0.61		11.5	FLOOD RISK
S3.000	Smhs05	115.073	0.223	0.000	0.84		12.8	FLOOD RISK
S2.001	Smhs06	115.021	0.241	0.000	1.35		22.5	SURCHARGED
S4.000	Smhs07	114.752	0.052	0.000	0.19		1.1	SURCHARGED
S2.002	Smhs08	114.751	0.131	0.000	1.28		21.1	SURCHARGED
S2.003	Smhs09	114.542	0.052	0.000	1.39		20.9	SURCHARGED
S5.000	Smhs10	115.316	-0.034	0.000	0.94		25.4	OK
S1.002	Smhs11	114.652	0.072	0.000	0.22		20.6	SURCHARGED
S1.003	Smhs12	114.637	0.217	0.000	0.32		23.0	SURCHARGED
S6.000	Smhs13	116.160	0.760	0.000	0.99		40.2	FLOOD RISK
S6.001	Smhs14	115.096	0.776	0.000	2.36		38.9	SURCHARGED
S1.004	Smhs15	112.086	-0.214	0.000	0.18		61.5	OK
S1.005	Smhs16	110.731	0.231	0.000	1.16		59.5	SURCHARGED
S1.006	Smhs17	111.486	1.030	0.000	0.33	56	25.6	FLOOD RISK

PN	US/MH Name	Level Exceeded
S1.000	Smhs02	
S1.001	Smhs03	
S2.000	Smhs04	
S3.000	Smhs05	
S2.001	Smhs06	
S4.000	Smhs07	
S2.002	Smhs08	
S2.003	Smhs09	
S5.000	Smhs10	
S1.002	Smhs11	
S1.003	Smhs12	
S6.000	Smhs13	
S6.001	Smhs14	
S1.004	Smhs15	
S1.005	Smhs16	
S1.006	Smhs17	