

## Soakaway Network Design

at

**Proposed Student Accomodation  
Franciscan Study Centre  
University of Kent**

for

**Empiric Student Property**



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Job No.

**17093**

Date:

August 2019

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Honeywood House Whitfield Kent CT16 3EH	University Of Kent SA1 Network (amended design)	
Date 01/08/2019 14:32	Designed by prl	
File T-2019-055 SA1 Network.mdx	Checked by	
XP Solutions	Network 2019.1	

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
1.000	24.640	0.308	80.0	0.025	5.00	0.600	o	150	Pipe/Conduit
1.001	15.560	0.194	80.2	0.000	0.00	0.600	o	150	Pipe/Conduit
2.000	10.020	0.502	20.0	0.025	5.00	0.600	o	150	Pipe/Conduit
1.002	3.970	0.050	79.4	0.000	0.00	0.600	o	150	Pipe/Conduit
* 1.003	1.000	0.000	0.0	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	MHS1.0	69.200	68.450	0.600	69.200	68.142	0.908		600
1.001	MHS1.1	69.200	68.142	0.908	69.200	67.948	1.102		600
2.000	MHS2.0	69.200	68.450	0.600	69.200	67.948	1.102		600
1.002	MHS1.2	69.200	67.948	1.102	69.350	67.898	1.302		1200
* 1.003	SA1	69.350	66.088	3.112	69.350	66.088	3.112	Pump	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	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 Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 1    Number of Storage Structures 1    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)	26.250	Storm Duration (mins)	30
Ratio R	0.400		


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Honeywood House Whitfield Kent CT16 3EH	University Of Kent SA1 Network (amended design)	
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Storage Structures for Storm

Cellular Storage Manhole: SA1, DS/PN: 1.003

Invert Level (m) 66.088 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.03100 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.03100

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	17.3	17.3	2.400	17.3	57.6	2.401	0.0	57.6

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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep    Fine Inertia Status OFF  
DTS Status    ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years)    2, 30, 100  
Climate Change (%)    0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
1.000	MHS1.0	30 minute 2 year Summer I+0%	69.200	68.503	0.000	5.1	OK
1.001	MHS1.1	30 minute 2 year Summer I+0%	69.200	68.196	0.000	5.1	OK
2.000	MHS2.0	30 minute 2 year Summer I+0%	69.200	68.488	0.000	5.1	OK
1.002	MHS1.2	30 minute 2 year Summer I+0%	69.200	68.044	0.000	10.2	OK
1.003	SA1	960 minute 2 year Winter I+0%	69.350	66.873	0.000	0.0	SURCHARGED*

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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
1.000	MHS1.0	30 minute 30 year Summer I+0%	69.200	68.526	0.000	9.7	OK
1.001	MHS1.1	30 minute 30 year Summer I+0%	69.200	68.220	0.000	9.7	OK
2.000	MHS2.0	30 minute 30 year Summer I+0%	69.200	68.503	0.000	9.7	OK
1.002	MHS1.2	30 minute 30 year Summer I+0%	69.200	68.137	0.000	19.1	SURCHARGED
1.003	SA1	960 minute 30 year Winter I+0%	69.350	67.524	0.000	0.0	SURCHARGED*

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
1.000	MHS1.0	960 minute 100 year Winter I+40%	69.200	69.167	0.000	1.2	FLOOD RISK
1.001	MHS1.1	960 minute 100 year Winter I+40%	69.200	69.166	0.000	1.2	FLOOD RISK
2.000	MHS2.0	960 minute 100 year Winter I+40%	69.200	69.166	0.000	1.2	FLOOD RISK
1.002	MHS1.2	960 minute 100 year Winter I+40%	69.200	69.165	0.000	2.4	FLOOD RISK
1.003	SA1	600 minute 100 year Winter I+40%	69.350	68.489	0.000	0.0	SURCHARGED*

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Honeywood House Whitfield Kent CT16 3EH	University Of Kent SA2 Network (amended design)	
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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
* 3.000	3.500	0.035	100.0	0.023	5.00	0.600	o	150	Pipe/Conduit
* 3.001	5.760	0.058	99.3	0.000	0.00	0.600	o	150	Pipe/Conduit
* 4.000	2.600	0.034	76.5	0.023	5.00	0.600	o	150	Pipe/Conduit
* 5.000	8.010	0.080	100.1	0.020	5.00	0.600	o	150	Pipe/Conduit
* 5.001	2.600	0.026	100.0	0.005	0.00	0.600	o	150	Pipe/Conduit
* 4.001	9.070	0.114	79.6	0.000	0.00	0.600	o	150	Pipe/Conduit
* 3.002	1.010	0.010	101.0	0.000	0.00	0.600	o	225	Pipe/Conduit
* 3.003	6.510	0.066	98.6	0.041	0.00	0.600	o	225	Pipe/Conduit
* 3.004	1.000	0.000	0.0	0.000	0.00	0.600	o	225	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)
* 3.000	MHS3.0	69.070	68.320	0.600	69.265	68.285	0.830		1200
* 3.001	MHS3.1	69.265	68.285	0.830	69.195	68.227	0.818		1200
* 4.000	MHS4.0	69.100	68.375	0.575	69.185	68.341	0.694		1200
* 5.000	MHS5.0	69.335	68.447	0.738	69.215	68.367	0.698		1200
* 5.001	MHS5.1	69.215	68.367	0.698	69.185	68.341	0.694		1200
* 4.001	MHS4.1	69.185	68.341	0.694	69.195	68.227	0.818		1200
* 3.002	MHS3.2	69.195	68.227	0.743	69.249	68.217	0.807		1200
* 3.003	MHS3.3	69.249	68.217	0.807	69.200	68.151	0.824		1200
* 3.004	SA2	69.200	66.000	2.975	69.200	66.000	2.975	Pump	1200


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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		

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Storage Structures for Storm

Cellular Storage Manhole: SA2, DS/PN: 3.004

Invert Level (m) 66.000 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.03100 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.03100

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	45.0	45.0	2.400	45.0	109.8	2.401	0.0	109.8



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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
3.000	MHS3.0	30 minute 2 year Summer I+0%	69.070	68.386	0.000	4.7	OK
3.001	MHS3.1	30 minute 2 year Summer I+0%	69.265	68.357	0.000	4.6	OK
4.000	MHS4.0	30 minute 2 year Summer I+0%	69.100	68.442	0.000	4.7	OK
5.000	MHS5.0	30 minute 2 year Summer I+0%	69.335	68.499	0.000	4.1	OK
5.001	MHS5.1	30 minute 2 year Summer I+0%	69.215	68.438	0.000	5.0	OK
4.001	MHS4.1	30 minute 2 year Summer I+0%	69.185	68.421	0.000	9.7	OK
3.002	MHS3.2	30 minute 2 year Summer I+0%	69.195	68.347	0.000	14.3	OK
3.003	MHS3.3	30 minute 2 year Summer I+0%	69.249	68.343	0.000	21.5	OK
3.004	SA2	960 minute 2 year Winter I+0%	69.200	66.699	0.000	0.0	SURCHARGED

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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
3.000	MHS3.0	30 minute 30 year Summer I+0%	69.070	68.489	0.000	8.3	SURCHARGED
3.001	MHS3.1	30 minute 30 year Summer I+0%	69.265	68.475	0.000	8.4	SURCHARGED
4.000	MHS4.0	30 minute 30 year Summer I+0%	69.100	68.565	0.000	8.0	SURCHARGED
5.000	MHS5.0	30 minute 30 year Summer I+0%	69.335	68.587	0.000	6.9	OK
5.001	MHS5.1	30 minute 30 year Summer I+0%	69.215	68.566	0.000	8.6	SURCHARGED
4.001	MHS4.1	30 minute 30 year Summer I+0%	69.185	68.554	0.000	16.7	SURCHARGED
3.002	MHS3.2	30 minute 30 year Summer I+0%	69.195	68.455	0.000	25.9	SURCHARGED
3.003	MHS3.3	30 minute 30 year Summer I+0%	69.249	68.443	0.000	37.8	SURCHARGED
3.004	SA2	960 minute 30 year Winter I+0%	69.200	67.299	0.000	0.0	SURCHARGED

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
3.000	MHS3.0	30 minute 100 year Summer I+40%	69.070	68.780	0.000	14.9	SURCHARGED
3.001	MHS3.1	30 minute 100 year Summer I+40%	69.265	68.726	0.000	14.8	SURCHARGED
4.000	MHS4.0	30 minute 100 year Summer I+40%	69.100	68.996	0.000	13.7	SURCHARGED
5.000	MHS5.0	30 minute 100 year Summer I+40%	69.335	69.046	0.000	11.7	SURCHARGED
5.001	MHS5.1	30 minute 100 year Summer I+40%	69.215	68.998	0.000	14.1	SURCHARGED
4.001	MHS4.1	30 minute 100 year Summer I+40%	69.185	68.947	0.000	27.8	SURCHARGED
3.002	MHS3.2	1440 minute 100 year Winter I+40%	69.195	68.751	0.000	2.5	SURCHARGED
3.003	MHS3.3	1440 minute 100 year Winter I+40%	69.249	68.773	0.000	3.9	SURCHARGED
3.004	SA2	1440 minute 100 year Winter I+40%	69.200	68.796	0.000	0.0	SURCHARGED

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Honeywood House Whitfield Kent CT16 3EH	University Of Kent SA3 Network (amended design)	
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XP Solutions	Network 2019.1	

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
6.000	8.890	0.089	99.9	0.013	5.00	0.600	o	150	Pipe/Conduit
6.001	12.780	0.128	99.8	0.000	0.00	0.600	o	150	Pipe/Conduit
7.000	3.550	0.447	7.9	0.010	5.00	0.600	o	100	Pipe/Conduit
6.002	1.750	0.018	100.0	0.000	0.00	0.600	o	150	Pipe/Conduit
* 6.003	1.000	0.000	0.0	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)
6.000	MHS6.0	69.245	68.595	0.500	69.200	68.506	0.544		1200
6.001	MHS6.1	69.200	68.506	0.544	69.425	68.378	0.897		1200
7.000	MHSx.0	69.425	68.825	0.500	69.425	68.378	0.947		1200
6.002	MHS6.2	69.425	68.378	0.897	69.425	68.361	0.914		1200
* 6.003	SA3	69.425	66.045	3.230	69.425	66.045	3.230	Pump	1200


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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		


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Storage Structures for Storm

Cellular Storage Manhole: SA3, DS/PN: 6.003

Invert Level (m) 66.045 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.02800 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.02800

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	8.0	8.0	2.400	8.0	36.8	2.401	0.0	36.8

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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
6.000	MHS6.0	30 minute 2 year Summer I+0%	69.245	68.636	0.000	2.7	OK
6.001	MHS6.1	30 minute 2 year Summer I+0%	69.200	68.547	0.000	2.7	OK
7.000	MHSx.0	30 minute 2 year Summer I+0%	69.425	68.847	0.000	2.0	OK
6.002	MHS6.2	30 minute 2 year Summer I+0%	69.425	68.447	0.000	4.7	OK
6.003	SA3	720 minute 2 year Winter I+0%	69.425	66.762	0.000	0.0	SURCHARGED

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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
6.000	MHS6.0	30 minute 30 year Summer I+0%	69.245	68.654	0.000	5.1	OK
6.001	MHS6.1	30 minute 30 year Summer I+0%	69.200	68.563	0.000	5.1	OK
7.000	MHSx.0	30 minute 30 year Summer I+0%	69.425	68.856	0.000	3.9	OK
6.002	MHS6.2	30 minute 30 year Summer I+0%	69.425	68.482	0.000	8.9	OK
6.003	SA3	960 minute 30 year Winter I+0%	69.425	67.339	0.000	0.0	SURCHARGED

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details


Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
6.000	MHS6.0	30 minute 100 year Summer I+40%	69.245	68.679	0.000	9.3	OK
6.001	MHS6.1	30 minute 100 year Summer I+40%	69.200	68.613	0.000	9.1	OK
7.000	MHSx.0	30 minute 100 year Summer I+40%	69.425	68.869	0.000	7.2	OK
6.002	MHS6.2	30 minute 100 year Summer I+40%	69.425	68.571	0.000	16.2	SURCHARGED
6.003	SA3	960 minute 100 year Winter I+40%	69.425	68.424	0.000	0.0	SURCHARGED



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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
7.000	19.370	0.194	99.8	0.013	5.00	0.600	o	150	Pipe/Conduit
7.001	12.520	0.125	100.2	0.013	0.00	0.600	o	150	Pipe/Conduit
7.002	16.050	0.160	100.3	0.000	0.00	0.600	o	150	Pipe/Conduit
7.003	1.490	0.015	99.3	0.026	0.00	0.600	o	225	Pipe/Conduit
7.004	1.440	0.014	100.0	0.000	0.00	0.600	o	225	Pipe/Conduit
* 7.005	1.000	0.000	0.0	0.000	0.00	0.600	o	225	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)
7.000	MHS7.0	69.000	68.350	0.500	69.000	68.156	0.694		1200
7.001	MHS7.1	69.000	68.156	0.694	69.015	68.031	0.834		1200
7.002	MHS7.2	69.015	68.031	0.834	69.146	67.871	1.125		1200
7.003	MHS7.3	69.146	67.871	1.050	69.146	67.856	1.065		1200
7.004	MHS7.4	69.146	67.856	1.065	69.146	67.842	1.079		1200
* 7.005	SA7	69.146	65.946	2.975	69.146	65.946	2.975	Pump	1200

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		


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Storage Structures for Storm

Cellular Storage Manhole: SA7, DS/PN: 7.005

Invert Level (m) 65.946 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.02800 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.02800

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	17.5	17.5	2.400	17.5	58.3	2.401	0.0	58.3

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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
7.000	MHS7.0	30 minute 2 year Summer I+0%	69.000	68.390	0.000	2.7	OK
7.001	MHS7.1	30 minute 2 year Summer I+0%	69.000	68.213	0.000	5.0	OK
7.002	MHS7.2	30 minute 2 year Summer I+0%	69.015	68.087	0.000	4.9	OK
7.003	MHS7.3	30 minute 2 year Summer I+0%	69.146	67.959	0.000	9.5	OK
7.004	MHS7.4	30 minute 2 year Summer I+0%	69.146	67.943	0.000	9.5	OK
7.005	SA7	960 minute 2 year Winter I+0%	69.146	66.779	0.000	0.0	SURCHARGED

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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
7.000	MHS7.0	30 minute 30 year Summer I+0%	69.000	68.406	0.000	5.0	OK
7.001	MHS7.1	30 minute 30 year Summer I+0%	69.000	68.244	0.000	10.3	OK
7.002	MHS7.2	30 minute 30 year Summer I+0%	69.015	68.117	0.000	10.3	OK
7.003	MHS7.3	30 minute 30 year Summer I+0%	69.146	68.010	0.000	20.7	OK
7.004	MHS7.4	30 minute 30 year Summer I+0%	69.146	67.994	0.000	20.7	OK
7.005	SA7	960 minute 30 year Winter I+0%	69.146	67.452	0.000	0.0	SURCHARGED

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
7.000	MHS7.0	1440 minute 100 year Winter I+40%	69.000	68.899	0.000	0.5	SURCHARGED
7.001	MHS7.1	1440 minute 100 year Winter I+40%	69.000	68.899	0.000	0.9	SURCHARGED
7.002	MHS7.2	1440 minute 100 year Winter I+40%	69.015	68.898	0.000	0.9	SURCHARGED
7.003	MHS7.3	1440 minute 100 year Winter I+40%	69.146	68.898	0.000	1.8	SURCHARGED
7.004	MHS7.4	1440 minute 100 year Winter I+40%	69.146	68.898	0.000	1.8	SURCHARGED
7.005	SA7	1440 minute 100 year Winter I+40%	69.146	68.898	0.000	0.0	SURCHARGED

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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
16.000	2.980	0.050	59.6	0.019	5.00	0.600	o	150	Pipe/Conduit
16.001	23.050	0.384	60.0	0.010	0.00	0.600	o	150	Pipe/Conduit
17.000	12.670	0.557	22.7	0.013	5.00	0.600	o	150	Pipe/Conduit
17.001	2.350	0.089	26.4	0.000	0.00	0.600	o	150	Pipe/Conduit
16.002	1.580	0.026	60.0	0.013	0.00	0.600	o	150	Pipe/Conduit
* 16.003	1.000	0.000	0.0	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)
16.000	MHS16.0	69.431	68.520	0.761	69.301	68.470	0.681		1200
16.001	MHS16.1	69.301	68.470	0.681	69.106	68.086	0.870		1200
17.000	MHS17.0	69.375	68.732	0.493	69.275	68.175	0.950		1200
17.001	MHS17.1	69.275	68.175	0.950	69.106	68.086	0.870		1200
16.002	MHS16.2	69.106	68.086	0.870	69.150	68.060	0.940		1200
* 16.003	SA9	69.150	65.950	3.050	69.150	65.950	3.050	Pump	1200


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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		


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Storage Structures for Storm

Cellular Storage Manhole: SA9, DS/PN: 16.003

Invert Level (m) 66.350 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.02800 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.02800

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	20.0	20.0	2.400	20.0	63.2	2.401	0.0	63.2

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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details


Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
16.000	MHS16.0	30 minute 2 year Summer I+0%	69.431	68.574	0.000	3.9	OK
16.001	MHS16.1	30 minute 2 year Summer I+0%	69.301	68.522	0.000	5.7	OK
17.000	MHS17.0	30 minute 2 year Summer I+0%	69.375	68.760	0.000	2.7	OK
17.001	MHS17.1	30 minute 2 year Summer I+0%	69.275	68.213	0.000	2.7	OK
16.002	MHS16.2	30 minute 2 year Summer I+0%	69.106	68.205	0.000	10.6	OK
16.003	SA9	960 minute 2 year Winter I+0%	69.150	67.111	0.000	0.0	SURCHARGED



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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
16.000	MHS16.0	30 minute 30 year Summer I+0%	69.431	68.598	0.000	7.4	OK
16.001	MHS16.1	30 minute 30 year Summer I+0%	69.301	68.548	0.000	11.4	OK
17.000	MHS17.0	30 minute 30 year Summer I+0%	69.375	68.770	0.000	5.1	OK
17.001	MHS17.1	30 minute 30 year Summer I+0%	69.275	68.325	0.000	5.2	SURCHARGED
16.002	MHS16.2	30 minute 30 year Summer I+0%	69.106	68.320	0.000	21.2	SURCHARGED
16.003	SA9	960 minute 30 year Winter I+0%	69.150	67.739	0.000	0.0	SURCHARGED

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep    Fine Inertia Status OFF  
DTS Status    ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years)    2, 30, 100  
Climate Change (%)    0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
16.000	MHS16.0	1440 minute 100 year Winter I+40%	69.431	68.873	0.000	0.7	SURCHARGED
16.001	MHS16.1	1440 minute 100 year Winter I+40%	69.301	68.875	0.000	1.0	SURCHARGED
17.000	MHS17.0	1440 minute 100 year Winter I+40%	69.375	68.868	0.000	0.5	OK
17.001	MHS17.1	1440 minute 100 year Winter I+40%	69.275	68.877	0.000	0.5	SURCHARGED
16.002	MHS16.2	1440 minute 100 year Winter I+40%	69.106	68.880	0.000	1.9	SURCHARGED
16.003	SA9	1440 minute 100 year Winter I+40%	69.150	68.880	0.000	0.0	SURCHARGED

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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
19.000	21.850	0.146	150.0	0.026	5.00	0.600	o	150	Pipe/Conduit
* 19.001	7.710	0.051	151.2	0.017	0.00	0.600	o	225	Pipe/Conduit
* 19.002	2.970	0.020	148.5	0.016	0.00	0.600	o	225	Pipe/Conduit
* 19.003	1.140	0.007	162.9	0.000	0.00	0.600	o	225	Pipe/Conduit
* 19.004	1.000	0.000	0.0	0.000	0.00	0.600	o	225	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)
19.000	MHS19.0	68.985	68.385	0.450	69.200	68.239	0.811		1200
* 19.001	MHS19.1	69.200	68.239	0.736	69.325	68.188	0.912		1200
* 19.002	MHS19.2	69.325	68.188	0.912	69.325	68.168	0.932		1200
* 19.003	MHS19.3	69.325	68.168	0.932	69.150	68.161	0.764		1200
* 19.004	SA10	69.150	65.950	2.975	69.150	65.950	2.975	Pump	1200

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		


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Storage Structures for Storm

Cellular Storage Manhole: SA10, DS/PN: 19.004

Invert Level (m) 65.950 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.02800 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.02800

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	22.5	22.5	2.400	22.5	68.1	2.401	0.0	68.1

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2 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
19.000	MHS19.0	30 minute 2 year Summer I+0%	68.985	68.450	0.000	5.3	OK
19.001	MHS19.1	30 minute 2 year Summer I+0%	69.200	68.317	0.000	8.3	OK
19.002	MHS19.2	30 minute 2 year Summer I+0%	69.325	68.289	0.000	11.1	OK
19.003	MHS19.3	30 minute 2 year Summer I+0%	69.325	68.263	0.000	11.1	OK
19.004	SA10	960 minute 2 year Winter I+0%	69.150	66.685	0.000	0.0	SURCHARGED

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30 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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


Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep Fine    Inertia Status OFF  
DTS Status ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
19.000	MHS19.0	30 minute 30 year Summer I+0%	68.985	68.481	0.000	10.0	OK
19.001	MHS19.1	30 minute 30 year Summer I+0%	69.200	68.367	0.000	16.7	OK
19.002	MHS19.2	30 minute 30 year Summer I+0%	69.325	68.349	0.000	23.0	OK
19.003	MHS19.3	30 minute 30 year Summer I+0%	69.325	68.317	0.000	22.8	OK
19.004	SA10	960 minute 30 year Winter I+0%	69.150	67.293	0.000	0.0	SURCHARGED

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100 year Return Period 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 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 26.250    Cv (Summer) 0.750  
Region England and Wales    Ratio R 0.400    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 100.0    DVD Status OFF  
Analysis Timestep    Fine Inertia Status OFF  
DTS Status    ON

Profile(s)    Summer and Winter  
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years)    2, 30, 100  
Climate Change (%)    0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow (l/s)	Status
19.000	MHS19.0	30 minute 100 year Summer I+40%	68.985	68.795	0.000	17.1	SURCHARGED
19.001	MHS19.1	30 minute 100 year Summer I+40%	69.200	68.568	0.000	27.8	SURCHARGED
19.002	MHS19.2	1440 minute 100 year Winter I+40%	69.325	68.563	0.000	2.1	SURCHARGED
19.003	MHS19.3	1440 minute 100 year Winter I+40%	69.325	68.579	0.000	2.1	SURCHARGED
19.004	SA10	1440 minute 100 year Winter I+40%	69.150	68.591	0.000	0.0	SURCHARGED