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Science Park Square Brighton East Sussex	3611_SaltEarth_WestSussex Salt Earth Ltd Proposed Calculations	
Date 27/03/2018 File 3611_DRAINAGENETWORK.MDX	Designed by SD Checked by MN	
XP Solutions Network 2017.1.2		

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)	100	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm at outfall (pipe 1.008)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.050	4-8	0.005

Total Area Contributing (ha) = 0.055

Total Pipe Volume (m³) = 1.226

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Science Park Square

Brighton

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Proposed Calculations

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Micro Drainage

Time Area Diagram at outfall (pipe 2.002)

Time Area

Time Area

(mins) (ha)

(mins) (ha)

0-4 0.006

4-8 0.000

Total Area Contributing (ha) = 0.006

Total Pipe Volume (m³) = 0.143

Network Design Table for Storm

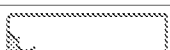
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	16.354	0.164	100.0	0.006	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	6.856	0.069	100.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	25.820	0.207	125.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	2.460	0.020	125.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.27	6.400	0.006	0.0	0.0	0.0	1.00	17.8	0.8
1.001	50.00	4.38	6.236	0.012	0.0	0.0	0.0	1.00	17.8	1.6
1.002	50.00	4.86	6.168	0.012	0.0	0.0	0.0	0.90	15.9	1.6
1.003	50.00	4.91	5.961	0.012	0.0	0.0	0.0	0.90	15.9	1.6

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<u>Network Design Table for Storm</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>1.004</td><td>2.417</td><td>0.019</td><td>125.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>1.005</td><td>3.868</td><td>0.010</td><td>400.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>1.006</td><td>4.454</td><td>0.011</td><td>400.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>1.007</td><td>3.571</td><td>0.009</td><td>400.0</td><td>0.006</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>1.008</td><td>3.557</td><td>0.009</td><td>400.0</td><td>0.037</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>2.000</td><td>3.275</td><td>0.008</td><td>400.0</td><td>0.000</td><td>4.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>2.001</td><td>1.441</td><td>0.004</td><td>400.0</td><td>0.006</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr><tr><td>2.002</td><td>3.351</td><td>0.008</td><td>400.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td>☺</td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>E I.Area (ha)</th><th>E Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>1.004</td><td>50.00</td><td>4.96</td><td>5.942</td><td>0.012</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.30</td><td>15.9</td><td>1.6</td></tr><tr><td>1.005</td><td>50.00</td><td>5.08</td><td>5.922</td><td>0.012</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>1.6</td></tr><tr><td>1.006</td><td>50.00</td><td>5.23</td><td>5.913</td><td>0.012</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>1.6</td></tr><tr><td>1.007</td><td>50.00</td><td>5.35</td><td>5.902</td><td>0.018</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>2.4</td></tr><tr><td>1.008</td><td>50.00</td><td>5.47</td><td>5.893</td><td>0.055</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>7.5</td></tr><tr><td>2.000</td><td>50.00</td><td>4.11</td><td>5.999</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>0.0</td></tr><tr><td>2.001</td><td>50.00</td><td>4.16</td><td>5.992</td><td>0.006</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>0.8</td></tr><tr><td>2.002</td><td>50.00</td><td>4.27</td><td>5.988</td><td>0.006</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.50</td><td>8.8</td><td>0.8</td></tr></table>												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	1.004	2.417	0.019	125.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	1.005	3.868	0.010	400.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	1.006	4.454	0.011	400.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	1.007	3.571	0.009	400.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	1.008	3.557	0.009	400.0	0.037	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	2.000	3.275	0.008	400.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	☺	2.001	1.441	0.004	400.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	2.002	3.351	0.008	400.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	☺	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)	1.004	50.00	4.96	5.942	0.012	0.0	0.0	0.0	0.30	15.9	1.6	1.005	50.00	5.08	5.922	0.012	0.0	0.0	0.0	0.50	8.8	1.6	1.006	50.00	5.23	5.913	0.012	0.0	0.0	0.0	0.50	8.8	1.6	1.007	50.00	5.35	5.902	0.018	0.0	0.0	0.0	0.50	8.8	2.4	1.008	50.00	5.47	5.893	0.055	0.0	0.0	0.0	0.50	8.8	7.5	2.000	50.00	4.11	5.999	0.000	0.0	0.0	0.0	0.50	8.8	0.0	2.001	50.00	4.16	5.992	0.006	0.0	0.0	0.0	0.50	8.8	0.8	2.002	50.00	4.27	5.988	0.006	0.0	0.0	0.0	0.50	8.8	0.8
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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN Invert Level (m)	Diameter (mm)	Pipes In PN Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	6.700	0.300	Open Manhole	400	1.000	6.400	150		
2	6.700	0.464	Open Manhole	400	1.001	6.236	150	1.000	6.236
3	6.680	0.512	Open Manhole	600	1.002	6.168	150	1.001	6.168
4	6.710	0.749	Open Manhole	600	1.003	5.961	150	1.002	5.961
5	6.710	0.768	Open Manhole	1	1.004	5.942	150	1.003	5.942
6	6.710	0.788	Open Manhole	600	1.005	5.922	150	1.004	5.922
7	6.720	0.807	Open Manhole	1	1.006	5.913	150	1.005	5.913
8	6.720	0.818	Open Manhole	400	1.007	5.902	150	1.006	5.902
9	6.720	0.827	Open Manhole	1	1.008	5.893	150	1.007	5.893
	6.700	0.816	Open Manhole	0		OUTFALL		1.008	5.884
10	6.720	0.720	Open Manhole	1	2.000	6.000	150		
11	6.710	0.718	Open Manhole	400	2.001	5.992	150	2.000	5.992
12	6.700	0.712	Open Manhole	1	2.002	5.988	150	2.001	5.988
	6.700	0.720	Open Manhole	0		OUTFALL		2.002	5.980

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PIPELINE SCHEDULES for Storm Upstream Manhole <table><tr><th>PN</th><th>Hyd Sect</th><th>Diam (mm)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>o</td><td>150</td><td>1</td><td>6.700</td><td>6.400</td><td>0.150</td><td>Open Manhole</td><td>400</td></tr><tr><td>1.001</td><td>o</td><td>150</td><td>2</td><td>6.700</td><td>6.236</td><td>0.314</td><td>Open Manhole</td><td>400</td></tr><tr><td>1.002</td><td>o</td><td>150</td><td>3</td><td>6.680</td><td>6.168</td><td>0.362</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.003</td><td>o</td><td>150</td><td>4</td><td>6.710</td><td>5.961</td><td>0.599</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.004</td><td>o</td><td>150</td><td>5</td><td>6.710</td><td>5.942</td><td>0.618</td><td>Open Manhole</td><td>1</td></tr><tr><td>1.005</td><td>o</td><td>150</td><td>6</td><td>6.710</td><td>5.922</td><td>0.638</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.006</td><td>o</td><td>150</td><td>7</td><td>6.720</td><td>5.913</td><td>0.657</td><td>Open Manhole</td><td>1</td></tr><tr><td>1.007</td><td>o</td><td>150</td><td>8</td><td>6.720</td><td>5.902</td><td>0.668</td><td>Open Manhole</td><td>400</td></tr><tr><td>1.008</td><td>o</td><td>150</td><td>9</td><td>6.720</td><td>5.893</td><td>0.677</td><td>Open Manhole</td><td>1</td></tr></table> Downstream Manhole <table><tr><th>PN</th><th>Length (m)</th><th>Slope (1:X)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>16.354</td><td>100.0</td><td>2</td><td>6.700</td><td>6.236</td><td>0.314</td><td>Open Manhole</td><td>400</td></tr><tr><td>1.001</td><td>6.856</td><td>100.0</td><td>3</td><td>6.680</td><td>6.168</td><td>0.362</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.002</td><td>25.820</td><td>125.0</td><td>4</td><td>6.710</td><td>5.961</td><td>0.599</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.003</td><td>2.460</td><td>125.0</td><td>5</td><td>6.710</td><td>5.942</td><td>0.618</td><td>Open Manhole</td><td>1</td></tr><tr><td>1.004</td><td>2.417</td><td>125.0</td><td>6</td><td>6.710</td><td>5.922</td><td>0.638</td><td>Open Manhole</td><td>600</td></tr><tr><td>1.005</td><td>3.868</td><td>400.0</td><td>7</td><td>6.720</td><td>5.913</td><td>0.657</td><td>Open Manhole</td><td>1</td></tr><tr><td>1.006</td><td>4.454</td><td>400.0</td><td>8</td><td>6.720</td><td>5.902</td><td>0.668</td><td>Open Manhole</td><td>400</td></tr><tr><td>1.007</td><td>3.571</td><td>400.0</td><td>9</td><td>6.720</td><td>5.893</td><td>0.677</td><td>Open Manhole</td><td>1</td></tr><tr><td>1.008</td><td>3.557</td><td>400.0</td><td></td><td>6.700</td><td>5.884</td><td>0.666</td><td>Open Manhole</td><td>0</td></tr></table>			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	150	1	6.700	6.400	0.150	Open Manhole	400	1.001	o	150	2	6.700	6.236	0.314	Open Manhole	400	1.002	o	150	3	6.680	6.168	0.362	Open Manhole	600	1.003	o	150	4	6.710	5.961	0.599	Open Manhole	600	1.004	o	150	5	6.710	5.942	0.618	Open Manhole	1	1.005	o	150	6	6.710	5.922	0.638	Open Manhole	600	1.006	o	150	7	6.720	5.913	0.657	Open Manhole	1	1.007	o	150	8	6.720	5.902	0.668	Open Manhole	400	1.008	o	150	9	6.720	5.893	0.677	Open Manhole	1	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	16.354	100.0	2	6.700	6.236	0.314	Open Manhole	400	1.001	6.856	100.0	3	6.680	6.168	0.362	Open Manhole	600	1.002	25.820	125.0	4	6.710	5.961	0.599	Open Manhole	600	1.003	2.460	125.0	5	6.710	5.942	0.618	Open Manhole	1	1.004	2.417	125.0	6	6.710	5.922	0.638	Open Manhole	600	1.005	3.868	400.0	7	6.720	5.913	0.657	Open Manhole	1	1.006	4.454	400.0	8	6.720	5.902	0.668	Open Manhole	400	1.007	3.571	400.0	9	6.720	5.893	0.677	Open Manhole	1	1.008	3.557	400.0		6.700	5.884	0.666	Open Manhole	0
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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)
2.000	o	150	10	6.720	6.000	0.570	Open Manhole	1
2.001	o	150	11	6.710	5.992	0.568	Open Manhole	400
2.002	o	150	12	6.700	5.988	0.562	Open Manhole	1

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)
2.000	3.275	400.0	11	6.710	5.992	0.568	Open Manhole	400
2.001	1.441	400.0	12	6.700	5.988	0.562	Open Manhole	1
2.002	3.351	400.0		6.700	5.980	0.570	Open Manhole	0

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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	-	-	100	0.000	0.006	0.006
1.001	-	-	100	0.000	0.006	0.006
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	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.006	0.006
1.008	User	-	100	0.037	0.037	0.037
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.006	0.006
2.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.061	0.061	0.061

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)
1.008		6.700	5.884	0.000	0	0

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2.002	6.700	5.980	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff 0.750	Manhole Headloss Coeff (Global) 0.500	Inlet Coefficient 0.800
Areal Reduction Factor 1.000	Foul Sewage per hectare (l/s) 0.000	Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0	Additional Flow - % of Total Flow 0.000	Run Time (mins) 60
Hot Start Level (mm) 0	MADD Factor * 10m ³ /ha Storage 2.000	Output Interval (mins) 1

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 2	Number of Storage Structures 5	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm) 19.000	Cv (Summer) 0.750
Return Period (years)	100 Ratio R 0.350	Cv (Winter) 0.840
Region England and Wales	Profile Type Summer Storm	Duration (mins) 30

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Online Controls for Storm

Depth/Flow Relationship Manhole: 9, DS/PN: 1.008, Volume (m³): 0.1

Invert Level (m) 5.893

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.0000	0.600	0.0000	1.600	0.0000	2.600	0.0000	5.000	0.0000	7.500	0.0000
0.200	0.0000	0.800	0.0000	1.800	0.0000	3.000	0.0000	5.500	0.0000	8.000	0.0000
0.300	0.0000	1.000	0.0000	2.000	0.0000	3.500	0.0000	6.000	0.0000	8.500	0.0000
0.400	0.0000	1.200	0.0000	2.200	0.0000	4.000	0.0000	6.500	0.0000	9.000	0.0000
0.500	0.0000	1.400	0.0000	2.400	0.0000	4.500	0.0000	7.000	0.0000	9.500	0.0000

Depth/Flow Relationship Manhole: 12, DS/PN: 2.002, Volume (m³): 0.0

Invert Level (m) 5.988

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.0000	0.600	0.0000	1.600	0.0000	2.600	0.0000	5.000	0.0000	7.500	0.0000
0.200	0.0000	0.800	0.0000	1.800	0.0000	3.000	0.0000	5.500	0.0000	8.000	0.0000
0.300	0.0000	1.000	0.0000	2.000	0.0000	3.500	0.0000	6.000	0.0000	8.500	0.0000
0.400	0.0000	1.200	0.0000	2.200	0.0000	4.000	0.0000	6.500	0.0000	9.000	0.0000
0.500	0.0000	1.400	0.0000	2.400	0.0000	4.500	0.0000	7.000	0.0000	9.500	0.0000

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Storage Structures for Storm

Cellular Storage Manhole: 5, DS/PN: 1.004

Invert Level (m) 6.100 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.13392 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.13392

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	16.8	16.8	0.300	16.8	22.4	0.301	0.0	22.4

Cellular Storage Manhole: 7, DS/PN: 1.006

Invert Level (m) 6.100 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.13392 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.13392

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	34.8	34.8	0.400	34.8	44.3	0.401	0.0	44.3

Cellular Storage Manhole: 9, DS/PN: 1.008

Invert Level (m) 6.100 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.13392 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.13392

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<u>Cellular Storage Manhole: 9, DS/PN: 1.008</u> <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td></tr><tr><td>0.000</td><td>16.8</td><td>16.8</td><td>0.400</td><td>16.8</td><td>23.4</td><td>0.401</td><td>0.0</td><td>23.4</td></tr></table> <u>Cellular Storage Manhole: 10, DS/PN: 2.000</u> Invert Level (m) 6.100 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.13392 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.13392 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td></tr><tr><td>0.000</td><td>2.9</td><td>2.9</td><td>0.400</td><td>2.9</td><td>5.8</td><td>0.500</td><td>0.0</td><td>5.8</td></tr></table> <u>Cellular Storage Manhole: 12, DS/PN: 2.002</u> Invert Level (m) 6.100 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.13392 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.13392 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td></tr><tr><td>0.000</td><td>2.9</td><td>2.9</td><td>0.400</td><td>2.9</td><td>5.8</td><td>0.500</td><td>0.0</td><td>5.8</td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	16.8	16.8	0.400	16.8	23.4	0.401	0.0	23.4	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	2.9	2.9	0.400	2.9	5.8	0.500	0.0	5.8	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	2.9	2.9	0.400	2.9	5.8	0.500	0.0	5.8
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>													
PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status	
1.004	5	120 minute 1 year Winter I+40%	120	6.710	6.168	0.077	0.000	0.02	1.126	-0.212	0.2	SURCHARGED	
1.005	6	120 minute 1 year Winter I+40%	120	6.710	6.168	0.096	0.000	0.03	0.106	-0.079	0.3	SURCHARGED	
1.006	7	120 minute 1 year Winter I+40%	120	6.720	6.169	0.106	0.000	0.00	2.334	-4.934	0.0	SURCHARGED	
1.007	8	120 minute 1 year Winter I+40%	120	6.720	6.173	0.122	0.000	0.00	0.109	-4.014	0.0	SURCHARGED	
1.008	9	120 minute 1 year Winter I+40%	120	6.720	6.178	0.135	0.000	0.00	1.304	0.000	0.0	SURCHARGED	
2.000	10	960 minute 1 year Summer I+40%	960	6.720	6.191	0.041	0.000	0.00	0.250	-0.889	0.0	SURCHARGED	
2.001	11	120 minute 1 year Winter I+40%	120	6.710	6.188	0.047	0.000	0.02	0.077	0.563	0.2	SURCHARGED	
2.002	12	120 minute 1 year Winter I+40%	120	6.700	6.188	0.050	0.000	0.00	0.263	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	Manhole Headloss Coeff (Global) 0.500	MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0	Foul Sewage per hectare (l/s) 0.000	Inlet Coefficient 0.800
Hot Start Level (mm) 0	Additional Flow - % of Total Flow 0.000	Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 2	Number of Storage Structures 5	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
Region England and Wales	Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter

Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	40, 40, 40

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe			Status	
					Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Maximum Vol (m³)	Discharge Vol (m³)		Flow (l/s)
1.000	1	15 minute 30 year Winter I+40%	15	6.700	6.441	-0.109	0.000	0.17	0.005	1.214	2.8	FLOOD RISK
1.001	2	120 minute 30 year Winter I+40%	120	6.700	6.324	-0.063	0.000	0.12	0.054	5.116	1.8	OK
1.002	3	120 minute 30 year Winter I+40%	120	6.680	6.323	0.005	0.000	0.11	0.122	5.118	1.7	SURCHARGED
1.003	4	120 minute 30 year Winter I+40%	120	6.710	6.321	0.210	0.000	0.14	0.538	4.807	1.5	SURCHARGED

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PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status	
1.004	5	120 minute 30 year Winter I+40%	120	6.710	6.320	0.229	0.000	0.01	3.557	-0.813	0.1	SURCHARGED	
1.005	6	120 minute 30 year Winter I+40%	120	6.710	6.321	0.248	0.000	0.02	0.149	-0.873	0.2	SURCHARGED	
1.006	7	120 minute 30 year Winter I+40%	120	6.720	6.321	0.258	0.000	0.00	7.373	-12.101	0.0	SURCHARGED	
1.007	8	120 minute 30 year Winter I+40%	120	6.720	6.326	0.275	0.000	0.00	0.128	-9.728	0.0	SURCHARGED	
1.008	9	120 minute 30 year Winter I+40%	120	6.720	6.331	0.289	0.000	0.00	3.752	0.000	0.0	SURCHARGED	
2.000	10	120 minute 30 year Winter I+40%	120	6.720	6.382	0.232	0.000	0.00	0.773	-1.208	0.0	SURCHARGED	
2.001	11	120 minute 30 year Winter I+40%	120	6.710	6.383	0.241	0.000	0.04	0.103	1.230	0.4	SURCHARGED	
2.002	12	120 minute 30 year Winter I+40%	120	6.700	6.383	0.245	0.000	0.00	0.796	0.000	0.0	SURCHARGED	
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1.004	5	120 minute 100 year Winter I+40%	120	6.710	6.419	0.327	0.000	0.01	4.831	-1.204	0.1	FLOOD RISK	
1.005	6	120 minute 100 year Winter I+40%	120	6.710	6.419	0.347	0.000	0.01	0.176	-1.351	0.1	FLOOD RISK	
1.006	7	120 minute 100 year Winter I+40%	120	6.720	6.419	0.357	0.000	0.00	10.627	-15.998	0.0	SURCHARGED	
1.007	8	120 minute 100 year Winter I+40%	120	6.720	6.424	0.373	0.000	0.00	0.140	-12.822	0.0	FLOOD RISK	
1.008	9	120 minute 100 year Winter I+40%	120	6.720	6.428	0.386	0.000	0.00	5.300	0.000	0.0	FLOOD RISK	
2.000	10	120 minute 100 year Winter I+40%	120	6.720	6.492	0.342	0.000	0.00	1.072	-1.590	0.0	FLOOD RISK	
2.001	11	120 minute 100 year Winter I+40%	120	6.710	6.492	0.351	0.000	0.05	0.117	1.634	0.6	FLOOD RISK	
2.002	12	120 minute 100 year Winter I+40%	120	6.700	6.492	0.354	0.000	0.00	1.096	0.000	0.0	FLOOD RISK	
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