

BAM Design Ltd		Page 1
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage

Network 2014.1.1

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)	1	Add Flow / Climate Change (%)	0
M5-60 (mm)	19.500	Minimum Backdrop Height (m)	0.600
Ratio R	0.347	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.810		

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
S3.000	66.395	0.710	93.5	0.347	6.00	0.0	0.600	o	375	
S3.001	27.452	1.020	26.9	0.000	0.00	0.0	0.600	o	375	
S4.000	16.005	1.160	13.8	0.035	6.00	0.0	0.600	o	150	
S4.001	49.812	0.405	123.0	0.096	0.00	0.0	0.600	o	225	
S4.002	49.500	0.560	88.4	0.083	0.00	0.0	0.600	o	225	
S5.000	100.000#	0.038	2631.6	0.708	6.00	0.0	0.600	o	1400	
S5.001	6.833	0.045	151.8	0.000	0.00	0.0	0.600	o	375	

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)
S3.000	44.01	6.59	20.640	0.347	0.0	0.0	0.0	1.87	207.0	44.7
S3.001	43.61	6.72	19.930	0.347	0.0	0.0	0.0	3.50	387.1	44.7
S4.000	45.60	6.10	23.340	0.035	0.0	0.0	0.0	2.73	48.2	4.7
S4.001	43.36	6.80	22.010	0.131	0.0	0.0	0.0	1.18	46.8	16.6
S4.002	41.66	7.40	21.605	0.214	0.0	0.0	0.0	1.39	55.3	26.1
S5.000	39.83	8.10	20.978	0.708	0.0	0.0	0.0	0.79	1218.8	82.5
S5.001	39.64	8.18	20.940	0.708	0.0	0.0	0.0	1.47	162.1	82.5

BAM Design Ltd		Page 2
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage

Network 2014.1.1

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)	Auto Design
S6.000	65.764	0.440	149.5	0.147	6.00	0.0	0.600	0	225	
S6.001	17.556	0.935	18.8	0.000	0.00	0.0	0.600	0	225	
S4.003	29.022	0.290	100.0	0.000	0.00	0.0	0.600	0	150	
S4.004	15.539	0.155	100.2	0.000	0.00	0.0	0.600	0	150	
S7.000	29.530	0.200	147.6	0.212	6.00	0.0	0.600	0	225	
S7.001	25.548	0.170	150.3	0.047	0.00	0.0	0.600	0	225	
S7.002	31.148	0.365	85.3	0.110	0.00	0.0	0.600	0	225	
S8.000	12.362	0.120	103.0	0.078	6.00	0.0	0.600	0	150	
S7.003	3.120	0.020	156.0	0.000	0.00	0.0	0.600	0	300	
S7.004	4.480#	1.370	3.3	0.000	0.00	0.0	0.600	0	300	
S9.000	83.782	2.355	35.6	0.039	6.00	0.0	0.600	0	150	
S9.001	98.419	0.490	200.9	0.121	0.00	0.0	0.600	0	225	
S9.002	24.419	0.115	212.3	0.000	0.00	0.0	0.600	0	225	
S7.005	4.120#	0.005	824.0	0.000	0.00	0.0	0.600	0	300	
S4.005	365.000#	0.025	14600.0	0.000	0.00	0.0	0.600	0	1400	

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)
S6.000	42.70	7.03	22.420	0.147	0.0	0.0	0.0	1.07	42.4	18.4
S6.001	42.42	7.12	21.980	0.147	0.0	0.0	0.0	3.03	120.6	18.4
S4.003	38.51	8.66	20.895	1.069	0.0	0.0	0.0	1.00	17.8«	120.4
S4.004	37.94	8.92	20.605	1.069	0.0	0.0	0.0	1.00	17.7«	120.4
S7.000	44.42	6.46	21.680	0.212	0.0	0.0	0.0	1.07	42.7	27.5
S7.001	43.19	6.86	21.480	0.259	0.0	0.0	0.0	1.06	42.3	32.7
S7.002	42.14	7.22	21.310	0.369	0.0	0.0	0.0	1.42	56.3	45.5
S8.000	45.23	6.21	21.140	0.078	0.0	0.0	0.0	0.99	17.5	10.3
S7.003	42.02	7.27	20.870	0.447	0.0	0.0	0.0	1.26	88.8	54.9
S7.004	42.00	7.27	20.800	0.447	0.0	0.0	0.0	8.75	618.7	54.9
S9.000	43.29	6.82	22.540	0.039	0.0	0.0	0.0	1.69	29.9	4.9
S9.001	38.64	8.61	20.110	0.160	0.0	0.0	0.0	0.92	36.5	18.1
S9.002	37.63	9.07	19.620	0.160	0.0	0.0	0.0	0.89	35.5	18.1
S7.005	37.36	9.19	19.430	0.607	0.0	0.0	0.0	0.54	38.2«	66.3
S4.005	20.13	27.63	19.425	1.676	0.0	0.0	0.0	0.33	507.9	120.4

BAM Design Ltd		Page 3
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

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)	Auto Design
S4.006	10.767	0.265	40.6	0.000	0.00	0.0	0.600	o	150	
S3.002	81.183	0.840	96.6	0.000	0.00	0.0	0.600	o	375	
S10.000	21.076	1.647	12.8	0.059	6.00	0.0	0.600	o	150	

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)
S4.006	20.08	27.74	19.400	1.676	0.0	0.0	0.0	1.58	28.0«	120.4
S3.002	19.76	28.48	18.910	2.023	0.0	0.0	0.0	1.84	203.6	120.4
S10.000	45.51	6.12	23.430	0.059	0.0	0.0	0.0	2.83	50.0	7.9

BAM Design Ltd		Page 5
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	
Micro Drainage	Network 2014.1.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	o	375	S27	22.250	20.640	1.235	Open Manhole	1350
S3.001	o	375	S28	22.770	19.930	2.465	Open Manhole	1350
S4.000	o	150	S5	24.700	23.340	1.210	Open Manhole	1200
S4.001	o	225	S6	23.960	22.010	1.725	Open Manhole	1200
S4.002	o	225	S7	23.875	21.605	2.045	Open Manhole	1200
S5.000	o	1400	S101	23.875	20.978	1.497	Open Manhole	2300
S5.001	o	375	S102	23.875	20.940	2.560	Open Manhole	450
S6.000	o	225	S8	23.875	22.420	1.230	Open Manhole	1200
S6.001	o	225	S10	23.875	21.980	1.670	Open Manhole	1200
S4.003	o	150	S11	23.875	20.895	2.830	Open Manhole	1350
S4.004	o	150	S14	23.520	20.605	2.765	Open Manhole	1200
S7.000	o	225	S15	23.140	21.680	1.235	Open Manhole	1200
S7.001	o	225	S16	23.610	21.480	1.905	Open Manhole	1200
S7.002	o	225	S17	22.770	21.310	1.235	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)
S3.000	66.395	93.5	S28	22.770	19.930	2.465	Open Manhole	1350
S3.001	27.452	26.9	S1	22.255	18.910	2.970	Open Manhole	1350
S4.000	16.005	13.8	S6	23.960	22.180	1.630	Open Manhole	1200
S4.001	49.812	123.0	S7	23.875	21.605	2.045	Open Manhole	1200
S4.002	49.500	88.4	S11	23.875	21.045	2.605	Open Manhole	1350
S5.000	100.000#	2631.6	S102	23.875	20.940	1.535	Open Manhole	450
S5.001	6.833	151.8	S11	23.875	20.895	2.605	Open Manhole	1350
S6.000	65.764	149.5	S10	23.875	21.980	1.670	Open Manhole	1200
S6.001	17.556	18.8	S11	23.875	21.045	2.605	Open Manhole	1350
S4.003	29.022	100.0	S14	23.520	20.605	2.765	Open Manhole	1200
S4.004	15.539	100.2	S201	23.360	20.450	2.760	Open Manhole	450
S7.000	29.530	147.6	S16	23.610	21.480	1.905	Open Manhole	1200
S7.001	25.548	150.3	S17	22.770	21.310	1.235	Open Manhole	1200
S7.002	31.148	85.3	S20	22.420	20.945	1.250	Open Manhole	1200

BAM Design Ltd		Page 6
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	
Micro Drainage		Network 2014.1.1

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)
S8.000	o	150	S19	22.160	21.140	0.870	Open Manhole	1200
S7.003	o	300	S20	22.420	20.870	1.250	Open Manhole	1200
S7.004	o	300	S21	22.420	20.800	1.320	Open Manhole	450
S9.000	o	150	S22	23.900	22.540	1.210	Open Manhole	1200
S9.001	o	225	S23	21.560	20.110	1.225	Open Manhole	1200
S9.002	o	225	S26	22.780	19.620	2.935	Open Manhole	1200
S7.005	o	300	S25	22.280	19.430	2.550	Open Manhole	1200
S4.005	o	1400	S201	23.360	19.425	2.535	Open Manhole	450
S4.006	o	150	S202	22.180	19.400	2.630	Open Manhole	450
S3.002	o	375	S1	22.255	18.910	2.970	Open Manhole	1350
S10.000	o	150	S24	24.790	23.430	1.210	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)
S8.000	12.362	103.0	S20	22.420	21.020	1.250	Open Manhole	1200
S7.003	3.120	156.0	S21	22.420	20.850	1.270	Open Manhole	450
S7.004	4.480#	3.3	S25	22.280	19.430	2.550	Open Manhole	1200
S9.000	83.782	35.6	S23	21.560	20.185	1.225	Open Manhole	1200
S9.001	98.419	200.9	S26	22.780	19.620	2.935	Open Manhole	1200
S9.002	24.419	212.3	S25	22.280	19.505	2.550	Open Manhole	1200
S7.005	4.120#	824.0	S201	23.360	19.425	3.635	Open Manhole	450
S4.005	365.000#	14600.0	S202	22.180	19.400	1.380	Open Manhole	450
S4.006	10.767	40.6	S1	22.255	19.135	2.970	Open Manhole	1350
S3.002	81.183	96.6	S2	20.100	18.070	1.655	Open Manhole	1800
S10.000	21.076	12.8	S102	23.875	21.783	1.942	Open Manhole	450

BAM Design Ltd		Page 8
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Setting Out Information - True Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
S7.003	S20	1200		469971.745	108947.360	
S7.004	S21	450		469970.725 #	108944.411 #	
S9.000	S22	1200		469887.124	109058.170	
S9.001	S23	1200		469860.037	108978.888	
S9.002	S26	1200		469953.127	108946.943	
S7.005	S25	1200		469977.086 #	108942.228 #	
S4.005	S201	450		470006.145 #	109020.474 #	
S4.006	S202	450		469980.319	108945.476	
S3.002	S1	1350		469976.091	108935.574	
S10.000	S24	1200		470011.290	109060.618	

- Indicates pipe length does not match coordinates

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
S3.002	S2	1800		470045.048	108892.730	
S10.000	S102	450		469990.855	109065.778	

BAM Design Ltd		Page 9
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31	Designed by worton	
File 4487 COMBINED.MDX	Checked by	
Micro Drainage		Network 2014.1.1

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
3.000	-	-	100	0.347	0.347	0.347
3.001	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.035	0.035	0.035
4.001	-	-	100	0.096	0.096	0.096
4.002	-	-	100	0.083	0.083	0.083
5.000	-	-	100	0.708	0.708	0.708
5.001	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.147	0.147	0.147
6.001	-	-	100	0.000	0.000	0.000
4.003	-	-	100	0.000	0.000	0.000
4.004	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.212	0.212	0.212
7.001	-	-	100	0.047	0.047	0.047
7.002	-	-	100	0.110	0.110	0.110
8.000	-	-	100	0.078	0.078	0.078
7.003	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.000	0.000	0.000
9.000	-	-	100	0.039	0.039	0.039
9.001	-	-	100	0.121	0.121	0.121
9.002	-	-	100	0.000	0.000	0.000
7.005	-	-	100	0.000	0.000	0.000
4.005	-	-	100	0.000	0.000	0.000
4.006	-	-	100	0.000	0.000	0.000
3.002	-	-	100	0.000	0.000	0.000
10.000	-	-	100	0.059	0.059	0.059
				Total	Total	Total
				2.082	2.082	2.082

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)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

S3.002	S2	20.100	18.070	0.000	1800	0
--------	----	--------	--------	-------	------	---

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

S10.000	S102	23.875	21.783	0.000	450	0
---------	------	--------	--------	-------	-----	---

BAM Design Ltd		Page 10
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	
Micro Drainage		Network 2014.1.1
<u>Simulation Criteria for Storm</u> Volumetric Runoff Coeff 0.840 Additional Flow - % of Total Flow 0.000 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000 Hot Start (mins) 0 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000 Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 4320 Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 24 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 2 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR Profile Type Winter Return Period (years) 100 Cv (Summer) 0.810 Region England and Wales Cv (Winter) 0.840 M5-60 (mm) 19.500 Storm Duration (mins) 2160 Ratio R 0.347		
©1982-2014 XP Solutions		

BAM Design Ltd		Page 11
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage

Network 2014.1.1

Online Controls for Storm

Hydro-Brake Optimum® Manhole: S11, DS/PN: S4.003, Volume (m³): 7.5

Unit Reference MD-SHE-0087-4500-2000-4500
Design Head (m) 2.000
Design Flow (l/s) 4.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 87
Invert Level (m) 20.895
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	4.5
Flush-Flo™	0.379	3.6
Kick-Flo®	0.775	2.9
Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	3.6	3.000	5.4	7.000	8.1
0.200	3.4	1.400	3.8	3.500	5.8	7.500	8.4
0.300	3.6	1.600	4.1	4.000	6.2	8.000	8.6
0.400	3.6	1.800	4.3	4.500	6.6	8.500	8.9
0.500	3.6	2.000	4.5	5.000	6.9	9.000	9.1
0.600	3.5	2.200	4.7	5.500	7.2	9.500	9.4
0.800	2.9	2.400	4.9	6.000	7.5		
1.000	3.3	2.600	5.1	6.500	7.8		

Hydro-Brake Optimum® Manhole: S202, DS/PN: S4.006, Volume (m³): 561.6

Unit Reference MD-SHE-0109-6000-1400-6000
Design Head (m) 1.400
Design Flow (l/s) 6.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 109
Invert Level (m) 19.400
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	6.0

BAM Design Ltd		Page 12																																																																								
Centrium, Griffiths Way																																																																										
St Albans																																																																										
Herts AL1 2RD																																																																										
Date 08/01/2016 13:31	Designed by worton																																																																									
File 4487 COMBINED.MDX	Checked by																																																																									
Micro Drainage	Network 2014.1.1																																																																									
<u>Hydro-Brake Optimum® Manhole: S202, DS/PN: S4.006, Volume (m³): 561.6</u>																																																																										
<table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Flush-Flo™</td><td>0.412</td><td>6.0</td></tr><tr><td>Kick-Flo®</td><td>0.859</td><td>4.8</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>5.2</td></tr></table>			Control Points	Head (m)	Flow (l/s)	Flush-Flo™	0.412	6.0	Kick-Flo®	0.859	4.8	Mean Flow over Head Range	-	5.2																																																												
Control Points	Head (m)	Flow (l/s)																																																																								
Flush-Flo™	0.412	6.0																																																																								
Kick-Flo®	0.859	4.8																																																																								
Mean Flow over Head Range	-	5.2																																																																								
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated																																																																										
<table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>3.7</td><td>1.200</td><td>5.6</td><td>3.000</td><td>8.6</td><td>7.000</td><td>12.8</td></tr><tr><td>0.200</td><td>5.5</td><td>1.400</td><td>6.0</td><td>3.500</td><td>9.2</td><td>7.500</td><td>13.2</td></tr><tr><td>0.300</td><td>5.9</td><td>1.600</td><td>6.4</td><td>4.000</td><td>9.8</td><td>8.000</td><td>13.7</td></tr><tr><td>0.400</td><td>6.0</td><td>1.800</td><td>6.7</td><td>4.500</td><td>10.4</td><td>8.500</td><td>14.1</td></tr><tr><td>0.500</td><td>5.9</td><td>2.000</td><td>7.1</td><td>5.000</td><td>10.9</td><td>9.000</td><td>14.4</td></tr><tr><td>0.600</td><td>5.8</td><td>2.200</td><td>7.4</td><td>5.500</td><td>11.4</td><td>9.500</td><td>14.8</td></tr><tr><td>0.800</td><td>5.2</td><td>2.400</td><td>7.7</td><td>6.000</td><td>11.9</td><td></td><td></td></tr><tr><td>1.000</td><td>5.1</td><td>2.600</td><td>8.0</td><td>6.500</td><td>12.4</td><td></td><td></td></tr></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.7	1.200	5.6	3.000	8.6	7.000	12.8	0.200	5.5	1.400	6.0	3.500	9.2	7.500	13.2	0.300	5.9	1.600	6.4	4.000	9.8	8.000	13.7	0.400	6.0	1.800	6.7	4.500	10.4	8.500	14.1	0.500	5.9	2.000	7.1	5.000	10.9	9.000	14.4	0.600	5.8	2.200	7.4	5.500	11.4	9.500	14.8	0.800	5.2	2.400	7.7	6.000	11.9			1.000	5.1	2.600	8.0	6.500	12.4		
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																			
0.100	3.7	1.200	5.6	3.000	8.6	7.000	12.8																																																																			
0.200	5.5	1.400	6.0	3.500	9.2	7.500	13.2																																																																			
0.300	5.9	1.600	6.4	4.000	9.8	8.000	13.7																																																																			
0.400	6.0	1.800	6.7	4.500	10.4	8.500	14.1																																																																			
0.500	5.9	2.000	7.1	5.000	10.9	9.000	14.4																																																																			
0.600	5.8	2.200	7.4	5.500	11.4	9.500	14.8																																																																			
0.800	5.2	2.400	7.7	6.000	11.9																																																																					
1.000	5.1	2.600	8.0	6.500	12.4																																																																					
©1982-2014 XP Solutions																																																																										

BAM Design Ltd		Page 13																		
Centrium, Griffiths Way St Albans Herts AL1 2RD																				
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by																			
Micro Drainage	Network 2014.1.1																			
<u>Storage Structures for Storm</u> <u>Tank or Pond Manhole: S11, DS/PN: S4.003</u> Invert Level (m) 21.780 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>39.6</td><td>1.621</td><td>756.0</td><td>1.971</td><td>2520.0</td></tr><tr><td>1.619</td><td>39.6</td><td>1.969</td><td>756.0</td><td>2.095</td><td>2520.0</td></tr></table>			Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	39.6	1.621	756.0	1.971	2520.0	1.619	39.6	1.969	756.0	2.095	2520.0
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)															
0.000	39.6	1.621	756.0	1.971	2520.0															
1.619	39.6	1.969	756.0	2.095	2520.0															
©1982-2014 XP Solutions																				

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Time Period(s) (years)	100
Climate Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 15
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 30 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	8	20.644	0.799	0.000	1.56	0.0	51.1	SURCHARGED
S7.005	S25	20	20.372	0.642	0.000	3.81	0.0	184.2	SURCHARGED
S4.005	S201	26	20.061	-0.764	0.000	0.08	0.0	152.1	OK
S4.006	S202	26	20.060	0.510	0.000	0.24	0.0	5.9	SURCHARGED
S3.002	S1	1	19.182	-0.103	0.000	0.87	0.0	167.9	OK
S10.000	S24	1	23.514	-0.066	0.000	0.60	0.0	28.4	OK

Summary Wizard of 60 minute 100 year Summer I+30% for Storm

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	1
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	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	100
Climate Change (%)	30

PN	US/MH Name	Rank	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
			Level (m)		Volume (m³)			Flow (l/s)	
S3.000	S27	3	20.867	-0.148	0.000	0.67	0.0	130.7	OK
S3.001	S28	3	20.092	-0.213	0.000	0.39	0.0	130.9	OK
S4.000	S5	2	24.017	0.527	0.000	0.27	0.0	12.0	SURCHARGED
S4.001	S6	1	23.960	1.725	0.060	0.88	0.0	39.6	FLOOD
S4.002	S7	1	23.821	1.991	0.000	1.24	0.0	66.0	FLOOD RISK
S5.000	S101	24	23.690	1.312	0.000	0.14	0.0	228.7	FLOOD RISK
S5.001	S102	24	23.690	2.375	0.000	1.83	0.0	196.6	FLOOD RISK
S6.000	S8	5	23.813	1.168	0.000	1.14	0.0	46.9	FLOOD RISK
S6.001	S10	24	23.611	1.406	0.000	0.34	0.0	36.5	FLOOD RISK
S4.003	S11	24	23.609	2.564	0.000	0.30	0.0	5.2	FLOOD RISK
S4.004	S14	24	20.663	-0.092	0.000	0.32	0.0	5.2	OK
S7.000	S15	3	23.150	1.245	9.610	1.57	0.0	62.7	FLOOD
S7.001	S16	3	22.989	1.284	0.000	1.73	0.0	67.6	SURCHARGED
S7.002	S17	3	22.653	1.118	0.000	1.85	0.0	97.5	FLOOD RISK
S8.000	S19	3	21.767	0.477	0.000	1.77	0.0	28.2	SURCHARGED
S7.003	S20	3	21.385	0.215	0.000	2.45	0.0	124.6	SURCHARGED
S7.004	S21	3	20.937	-0.163	0.000	0.43	0.0	124.9	OK
S9.000	S22	3	22.615	-0.075	0.000	0.50	0.0	14.6	OK
S9.001	S23	3	21.543	1.208	0.000	1.37	0.0	49.0	FLOOD RISK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 21
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 180 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	25	20.364	0.519	0.000	0.88	0.0	28.6	SURCHARGED
S7.005	S25	21	20.358	0.628	0.000	2.30	0.0	111.0	SURCHARGED
S4.005	S201	20	20.355	-0.470	0.000	0.06	0.0	108.4	OK
S4.006	S202	20	20.352	0.802	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	6	19.071	-0.214	0.000	0.39	0.0	74.9	OK
S10.000	S24	6	23.481	-0.099	0.000	0.25	0.0	11.9	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 23
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 240 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	23	20.404	0.559	0.000	0.72	0.0	23.6	SURCHARGED
S7.005	S25	18	20.400	0.670	0.000	1.91	0.0	92.2	SURCHARGED
S4.005	S201	18	20.399	-0.426	0.000	0.05	0.0	93.0	OK
S4.006	S202	18	20.396	0.846	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	8	19.056	-0.229	0.000	0.32	0.0	62.2	OK
S10.000	S24	8	23.476	-0.104	0.000	0.21	0.0	9.7	OK

BAM Design Ltd		Page 25
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 360 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	19	20.470	0.625	0.000	0.55	0.0	17.8	SURCHARGED
S7.005	S25	16	20.466	0.736	0.000	1.50	0.0	72.3	SURCHARGED
S4.005	S201	16	20.464	-0.361	0.000	0.04	0.0	74.1	OK
S4.006	S202	16	20.460	0.910	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	10	19.036	-0.249	0.000	0.25	0.0	47.9	OK
S10.000	S24	10	23.469	-0.111	0.000	0.15	0.0	7.3	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 27
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 480 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	17	20.516	0.671	0.000	0.44	0.0	14.5	SURCHARGED
S7.005	S25	14	20.514	0.784	0.000	1.22	0.0	58.7	SURCHARGED
S4.005	S201	14	20.512	-0.313	0.000	0.03	0.0	62.1	OK
S4.006	S202	14	20.505	0.955	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	12	19.024	-0.261	0.000	0.20	0.0	39.6	OK
S10.000	S24	12	23.465	-0.115	0.000	0.12	0.0	5.9	OK

BAM Design Ltd		Page 29
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 600 minute 100 year Summer I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.000	S22	13	22.573	-0.117	0.000	0.11	0.0	3.3	OK
S9.001	S23	19	20.556	0.221	0.000	0.36	0.0	13.0	SURCHARGED
S9.002	S26	16	20.552	0.707	0.000	0.38	0.0	12.3	SURCHARGED
S7.005	S25	13	20.549	0.819	0.000	1.03	0.0	49.6	SURCHARGED
S4.005	S201	13	20.548	-0.277	0.000	0.03	0.0	53.8	OK
S4.006	S202	13	20.540	0.990	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	13	19.015	-0.270	0.000	0.18	0.0	34.2	OK
S10.000	S24	13	23.462	-0.118	0.000	0.10	0.0	4.9	OK

BAM Design Ltd		Page 31
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 720 minute 100 year Summer I+30% for Storm

PN	US/MH Name Rank		Water Level	Surch'ed	Flooded Volume	Flow /	O'flow	Pipe Flow	Status
			(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	
S9.002	S26	14	20.579	0.734	0.000	0.33	0.0	10.8	SURCHARGED
S7.005	S25	11	20.577	0.847	0.000	0.89	0.0	43.2	SURCHARGED
S4.005	S201	11	20.576	-0.249	0.000	0.03	0.0	47.7	OK
S4.006	S202	11	20.567	1.017	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	15	19.009	-0.276	0.000	0.16	0.0	30.4	OK
S10.000	S24	15	23.460	-0.120	0.000	0.09	0.0	4.3	OK

BAM Design Ltd		Page 33
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 960 minute 100 year Summer I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow Cap. (l/s)		Pipe	Status
			Level (m)		Volume (m³)			Flow (l/s)	
S9.002	S26	10	20.620	0.775	0.000	0.27	0.0	8.8	SURCHARGED
S7.005	S25	9	20.618	0.888	0.000	0.72	0.0	34.7	SURCHARGED
S4.005	S201	9	20.617	-0.208	0.000	0.02	0.0	39.6	OK
S4.006	S202	9	20.608	1.058	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	17	19.000	-0.285	0.000	0.13	0.0	25.5	OK
S10.000	S24	17	23.457	-0.123	0.000	0.07	0.0	3.4	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 35
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 1440 minute 100 year Summer I+30% for Storm

PN	US/MH		Water		Flooded		Pipe		Status
			Level	Surch'd	Volume	Flow /	O'flow	Flow	
	Name	Rank	(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	
S9.002	S26	7	20.675	0.830	0.000	0.19	0.0	6.4	SURCHARGED
S7.005	S25	7	20.674	0.944	0.000	0.53	0.0	25.4	SURCHARGED
S4.005	S201	7	20.674	-0.151	0.000	0.02	0.0	30.4	OK
S4.006	S202	7	20.662	1.112	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	20	18.990	-0.295	0.000	0.10	0.0	20.0	OK
S10.000	S24	20	23.452	-0.128	0.000	0.05	0.0	2.5	OK

BAM Design Ltd		Page 37
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 2160 minute 100 year Summer I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow		Pipe	Status
	Name	Rank	Level (m)		Volume (m³)	Cap.	(l/s)	Flow (l/s)	
S9.002	S26	5	20.709	0.864	0.000	0.14	0.0	4.7	SURCHARGED
S7.005	S25	5	20.708	0.978	0.000	0.38	0.0	18.5	SURCHARGED
S4.005	S201	5	20.708	-0.117	0.000	0.01	0.0	23.6	OK
S4.006	S202	5	20.695	1.145	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	22	18.982	-0.303	0.000	0.08	0.0	16.0	OK
S10.000	S24	22	23.449	-0.131	0.000	0.04	0.0	1.8	OK

Summary Wizard of 2880 minute 100 year Summer I+30% for Storm

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	1
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

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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	100
Climate Change (%)	30

PN	US/MH Name	Rank	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
			Level (m)		Volume (m³)			Flow (l/s)	
S3.000	S27	24	20.690	-0.325	0.000	0.04	0.0	8.6	OK
S3.001	S28	24	19.970	-0.335	0.000	0.03	0.0	8.6	OK
S4.000	S5	26	23.769	0.279	0.000	0.02	0.0	0.8	SURCHARGED
S4.001	S6	26	23.768	1.533	0.000	0.07	0.0	3.1	FLOOD RISK
S4.002	S7	23	23.766	1.936	0.000	0.10	0.0	5.1	FLOOD RISK
S5.000	S101	21	23.764	1.386	0.000	0.01	0.0	17.3	FLOOD RISK
S5.001	S102	21	23.765	2.450	0.000	0.16	0.0	17.3	FLOOD RISK
S6.000	S8	23	23.766	1.121	0.000	0.09	0.0	3.5	FLOOD RISK
S6.001	S10	20	23.764	1.559	0.000	0.03	0.0	3.5	FLOOD RISK
S4.003	S11	19	23.762	2.717	0.000	0.31	0.0	5.3	FLOOD RISK
S4.004	S14	4	20.739	-0.016	0.000	0.32	0.0	5.3	OK
S7.000	S15	24	21.734	-0.171	0.000	0.13	0.0	5.3	OK
S7.001	S16	24	21.541	-0.164	0.000	0.16	0.0	6.4	OK
S7.002	S17	24	21.373	-0.162	0.000	0.17	0.0	9.2	OK
S8.000	S19	24	21.175	-0.115	0.000	0.12	0.0	1.9	OK
S7.003	S20	24	20.965	-0.205	0.000	0.22	0.0	11.1	OK
S7.004	S21	24	20.837	-0.263	0.000	0.04	0.0	11.1	OK
S9.000	S22	24	22.558	-0.132	0.000	0.03	0.0	1.0	OK
S9.001	S23	9	20.719	0.384	0.000	0.11	0.0	4.0	SURCHARGED

BAM Design Ltd		Page 39
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 2880 minute 100 year Summer I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow		Pipe	Status
	Name	Rank	Level (m)		Volume (m³)	Cap.	(l/s)	Flow (l/s)	
S9.002	S26	4	20.719	0.874	0.000	0.11	0.0	3.7	SURCHARGED
S7.005	S25	4	20.718	0.988	0.000	0.31	0.0	14.7	SURCHARGED
S4.005	S201	4	20.719	-0.106	0.000	0.01	0.0	19.8	OK
S4.006	S202	4	20.703	1.153	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	24	18.975	-0.310	0.000	0.07	0.0	13.8	OK
S10.000	S24	24	23.447	-0.133	0.000	0.03	0.0	1.5	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
n Period(s) (years)	100
Climate Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 41
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31	Designed by worton	
File 4487 COMBINED.MDX	Checked by	
Micro Drainage		Network 2014.1.1

Summary Wizard of 30 minute 100 year Winter I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	11	20.601	0.756	0.000	1.55	0.0	50.6	SURCHARGED
S7.005	S25	24	20.329	0.599	0.000	3.68	0.0	177.8	SURCHARGED
S4.005	S201	25	20.076	-0.749	0.000	0.08	0.0	154.6	OK
S4.006	S202	25	20.075	0.525	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	2	19.158	-0.127	0.000	0.76	0.0	147.8	OK
S10.000	S24	2	23.507	-0.073	0.000	0.52	0.0	24.6	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 45
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 120 minute 100 year Winter I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	26	20.363	0.518	0.000	0.82	0.0	26.9	SURCHARGED
S7.005	S25	22	20.348	0.618	0.000	2.19	0.0	105.6	SURCHARGED
S4.005	S201	21	20.319	-0.506	0.000	0.06	0.0	106.3	OK
S4.006	S202	21	20.309	0.759	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	7	19.065	-0.220	0.000	0.36	0.0	69.7	OK
S10.000	S24	7	23.479	-0.101	0.000	0.23	0.0	10.9	OK

Summary Wizard of 180 minute 100 year Winter I+30% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	1
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	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	100
Climate Change (%)	30

PN	US/MH Name	Rank	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow (l/s)	Pipe	Status
			Level (m)		Volume (m³)			Flow (l/s)	
S3.000	S27	9	20.766	-0.249	0.000	0.25	0.0	48.1	OK
S3.001	S28	9	20.024	-0.281	0.000	0.14	0.0	48.1	OK
S4.000	S5	21	23.795	0.305	0.000	0.10	0.0	4.7	SURCHARGED
S4.001	S6	21	23.791	1.556	0.000	0.38	0.0	17.0	FLOOD RISK
S4.002	S7	18	23.782	1.952	0.000	0.53	0.0	27.9	FLOOD RISK
S5.000	S101	10	23.835	1.457	0.000	0.06	0.0	95.5	FLOOD RISK
S5.001	S102	10	23.835	2.520	0.000	0.89	0.0	95.4	FLOOD RISK
S6.000	S8	18	23.785	1.140	0.000	0.48	0.0	19.6	FLOOD RISK
S6.001	S10	17	23.774	1.569	0.000	0.18	0.0	19.4	FLOOD RISK
S4.003	S11	17	23.771	2.726	0.000	0.31	0.0	5.3	FLOOD RISK
S4.004	S14	19	20.664	-0.091	0.000	0.32	0.0	5.3	OK
S7.000	S15	9	21.824	-0.081	0.000	0.74	0.0	29.4	OK
S7.001	S16	9	21.653	-0.052	0.000	0.91	0.0	35.7	OK
S7.002	S17	9	21.512	-0.023	0.000	0.96	0.0	50.7	OK
S8.000	S19	9	21.231	-0.059	0.000	0.68	0.0	10.8	OK
S7.003	S20	9	21.174	0.004	0.000	1.21	0.0	61.4	SURCHARGED
S7.004	S21	9	20.893	-0.207	0.000	0.21	0.0	61.4	OK
S9.000	S22	9	22.583	-0.107	0.000	0.18	0.0	5.4	OK
S9.001	S23	26	20.441	0.106	0.000	0.60	0.0	21.3	SURCHARGED

BAM Design Ltd		Page 47
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 180 minute 100 year Winter I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	22	20.412	0.567	0.000	0.61	0.0	20.0	SURCHARGED
S7.005	S25	19	20.396	0.666	0.000	1.68	0.0	81.2	SURCHARGED
S4.005	S201	19	20.383	-0.442	0.000	0.04	0.0	84.5	OK
S4.006	S202	19	20.378	0.828	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	9	19.044	-0.241	0.000	0.28	0.0	53.4	OK
S10.000	S24	9	23.472	-0.108	0.000	0.17	0.0	8.2	OK

BAM Design Ltd		Page 48
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 240 minute 100 year Winter I+30% 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 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 Storage Structures 1
 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 0.347
 Region England and Wales Cv (Summer) 0.810
 M5-60 (mm) 19.500 Cv (Winter) 0.840

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) 30, 60, 120, 180, 240, 360, 480, 600, 720,
 960, 1440, 2160, 2880
 Return Period(s) (years) 100
 Climate Change (%) 30

WARNING: The analysis maybe unstable. Please see the method of analysis help for more details.

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m ³)	Flow / Cap.	0'flow (l/s)	Pipe Flow (l/s)	Status
S3.000	S27	11	20.753	-0.262	0.000	0.20	0.0	38.8	OK
S3.001	S28	11	20.014	-0.291	0.000	0.11	0.0	38.8	OK
S4.000	S5	17	23.803	0.313	0.000	0.08	0.0	3.7	SURCHARGED
S4.001	S6	17	23.799	1.564	0.000	0.31	0.0	14.0	FLOOD RISK
S4.002	S7	16	23.792	1.962	0.000	0.43	0.0	23.0	FLOOD RISK
S5.000	S101	5	23.850	1.472	0.000	0.05	0.0	77.6	FLOOD RISK
S5.001	S102	4	23.850	2.535	0.004	0.72	0.0	77.5	FLOOD
S6.000	S8	15	23.794	1.149	0.000	0.39	0.0	15.9	FLOOD RISK
S6.001	S10	14	23.786	1.581	0.000	0.15	0.0	15.7	FLOOD RISK
S4.003	S11	14	23.783	2.738	0.000	0.31	0.0	5.3	FLOOD RISK
S4.004	S14	17	20.664	-0.091	0.000	0.33	0.0	5.3	OK
S7.000	S15	11	21.805	-0.100	0.000	0.60	0.0	23.7	OK
S7.001	S16	11	21.625	-0.080	0.000	0.74	0.0	29.0	OK
S7.002	S17	11	21.460	-0.075	0.000	0.78	0.0	41.3	OK
S8.000	S19	11	21.219	-0.071	0.000	0.55	0.0	8.7	OK
S7.003	S20	11	21.107	-0.063	0.000	0.98	0.0	50.0	OK
S7.004	S21	11	20.883	-0.217	0.000	0.17	0.0	50.0	OK

BAM Design Ltd		Page 49
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 240 minute 100 year Winter I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.000	S22	11	22.578	-0.112	0.000	0.15	0.0	4.4	OK
S9.001	S23	24	20.466	0.131	0.000	0.49	0.0	17.5	SURCHARGED
S9.002	S26	21	20.437	0.592	0.000	0.50	0.0	16.3	SURCHARGED
S7.005	S25	17	20.428	0.698	0.000	1.37	0.0	66.1	SURCHARGED
S4.005	S201	17	20.428	-0.397	0.000	0.04	0.0	70.0	OK
S4.006	S202	17	20.425	0.875	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	11	19.031	-0.254	0.000	0.23	0.0	44.1	OK
S10.000	S24	11	23.467	-0.113	0.000	0.14	0.0	6.6	OK

BAM Design Ltd		Page 51
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 360 minute 100 year Winter I+30% for Storm

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S9.002	S26	18	20.503	0.658	0.000	0.37	0.0	12.2	SURCHARGED
S7.005	S25	15	20.499	0.769	0.000	1.01	0.0	48.9	SURCHARGED
S4.005	S201	15	20.498	-0.327	0.000	0.03	0.0	53.5	OK
S4.006	S202	15	20.493	0.943	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	14	19.015	-0.270	0.000	0.17	0.0	33.8	OK
S10.000	S24	14	23.462	-0.118	0.000	0.10	0.0	4.9	OK

BAM Design Ltd		Page 52
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	
Micro Drainage Network 2014.1.1		

Summary Wizard of 480 minute 100 year Winter I+30% 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 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 Storage Structures 1
 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 0.347
 Region England and Wales Cv (Summer) 0.810
 M5-60 (mm) 19.500 Cv (Winter) 0.840

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) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
 Return Period(s) (years) 100
 Climate Change (%) 30

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	0'flow (l/s)	Pipe Flow (l/s)	Status
S3.000	S27	16	20.725	-0.290	0.000	0.12	0.0	23.1	OK
S3.001	S28	16	19.994	-0.311	0.000	0.07	0.0	23.1	OK
S4.000	S5	10	23.818	0.328	0.000	0.05	0.0	2.2	SURCHARGED
S4.001	S6	9	23.817	1.582	0.000	0.19	0.0	8.4	FLOOD RISK
S4.002	S7	5	23.813	1.983	0.000	0.26	0.0	13.7	FLOOD RISK
S5.000	S101	3	23.852	1.474	0.000	0.03	0.0	46.2	FLOOD RISK
S5.001	S102	3	23.853	2.538	0.000	0.43	0.0	46.2	FLOOD RISK
S6.000	S8	4	23.814	1.169	0.000	0.23	0.0	9.5	FLOOD RISK
S6.001	S10	4	23.809	1.604	0.000	0.09	0.0	9.4	FLOOD RISK
S4.003	S11	4	23.807	2.762	0.000	0.32	0.0	5.4	FLOOD RISK
S4.004	S14	10	20.664	-0.091	0.000	0.33	0.0	5.4	OK
S7.000	S15	16	21.772	-0.133	0.000	0.35	0.0	14.1	OK
S7.001	S16	16	21.584	-0.121	0.000	0.44	0.0	17.2	OK
S7.002	S17	16	21.418	-0.117	0.000	0.47	0.0	24.5	OK
S8.000	S19	16	21.199	-0.091	0.000	0.33	0.0	5.2	OK
S7.003	S20	16	21.035	-0.135	0.000	0.58	0.0	29.7	OK
S7.004	S21	16	20.864	-0.236	0.000	0.10	0.0	29.7	OK
S9.000	S22	16	22.570	-0.120	0.000	0.09	0.0	2.6	OK
S9.001	S23	18	20.558	0.223	0.000	0.29	0.0	10.4	SURCHARGED

©1982-2014 XP Solutions

BAM Design Ltd		Page 53
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 480 minute 100 year Winter I+30% for Storm

PN	US/MH		Water		Flooded		Pipe		Status
			Level	Surch'ed	Volume	Flow /	O'flow	Flow	
	Name	Rank	(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	
S9.002	S26	15	20.553	0.708	0.000	0.30	0.0	9.9	SURCHARGED
S7.005	S25	12	20.550	0.820	0.000	0.81	0.0	39.3	SURCHARGED
S4.005	S201	12	20.549	-0.276	0.000	0.02	0.0	44.2	OK
S4.006	S202	12	20.544	0.994	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	16	19.005	-0.280	0.000	0.15	0.0	28.2	OK
S10.000	S24	16	23.459	-0.121	0.000	0.08	0.0	3.9	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
(s) (years)	100
Change (%)	30

©1982-2014 XP Solutions

BAM Design Ltd		Page 55
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 600 minute 100 year Winter I+30% for Storm

PN	US/MH		Water		Flooded		Pipe		Status
			Level	Surch'd	Volume	Flow /	O'flow	Flow	
	Name	Rank	(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	
S9.002	S26	12	20.591	0.746	0.000	0.26	0.0	8.4	SURCHARGED
S7.005	S25	10	20.589	0.859	0.000	0.69	0.0	33.3	SURCHARGED
S4.005	S201	10	20.588	-0.237	0.000	0.02	0.0	38.3	OK
S4.006	S202	10	20.582	1.032	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	18	18.998	-0.287	0.000	0.13	0.0	24.6	OK
S10.000	S24	18	23.456	-0.124	0.000	0.07	0.0	3.3	OK

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.347
Region	England and Wales	Cv (Summer)	0.810
M5-60 (mm)	19.500	Cv (Winter)	0.840

Profile(s)	Summer and Winter
n(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880

WARNING: The analysis maybe unstable. Please see the method of analysis help for more details.

©1982-2014 XP Solutions

BAM Design Ltd		Page 57
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 720 minute 100 year Winter I+30% for Storm

PN	US/MH		Water		Flooded		Pipe		Status
			Level	Surch'd	Volume	Flow /	O'flow	Flow	
	Name	Rank	(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	
S9.000	S22	19	22.565	-0.125	0.000	0.06	0.0	1.9	OK
S9.001	S23	13	20.626	0.291	0.000	0.21	0.0	7.6	SURCHARGED
S9.002	S26	9	20.623	0.778	0.000	0.22	0.0	7.3	SURCHARGED
S7.005	S25	8	20.622	0.892	0.000	0.60	0.0	29.0	SURCHARGED
S4.005	S201	8	20.621	-0.204	0.000	0.02	0.0	34.0	OK
S4.006	S202	8	20.614	1.064	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	19	18.994	-0.291	0.000	0.11	0.0	22.1	OK
S10.000	S24	19	23.454	-0.126	0.000	0.06	0.0	2.9	OK

BAM Design Ltd		Page 59
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 960 minute 100 year Winter I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow		Pipe	Status
	Name	Rank	Level (m)		Volume (m³)	Cap.	(l/s)	Flow (l/s)	
S9.002	S26	6	20.681	0.836	0.000	0.18	0.0	5.8	SURCHARGED
S7.005	S25	6	20.679	0.949	0.000	0.48	0.0	23.2	SURCHARGED
S4.005	S201	6	20.679	-0.146	0.000	0.02	0.0	28.3	OK
S4.006	S202	6	20.667	1.117	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	21	18.988	-0.297	0.000	0.10	0.0	18.8	OK
S10.000	S24	21	23.451	-0.129	0.000	0.05	0.0	2.3	OK

BAM Design Ltd		Page 61
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 1440 minute 100 year Winter I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow Cap. (l/s)		Pipe	Status
			Level (m)		Volume (m³)			Flow (l/s)	
S9.002	S26	3	20.745	0.900	0.000	0.13	0.0	4.3	SURCHARGED
S7.005	S25	3	20.743	1.013	0.000	0.35	0.0	17.0	SURCHARGED
S4.005	S201	3	20.744	-0.081	0.000	0.01	0.0	22.1	OK
S4.006	S202	3	20.726	1.176	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	23	18.979	-0.306	0.000	0.08	0.0	15.2	OK
S10.000	S24	23	23.448	-0.132	0.000	0.04	0.0	1.7	OK

BAM Design Ltd		Page 63
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage	Network 2014.1.1
----------------	------------------

Summary Wizard of 2160 minute 100 year Winter I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow		Pipe	Status
	Name	Rank	Level (m)		Volume (m³)	Cap.	(l/s)	Flow (l/s)	
S9.002	S26	2	20.786	0.941	0.000	0.10	0.0	3.2	SURCHARGED
S7.005	S25	2	20.786	1.056	0.000	0.26	0.0	12.5	SURCHARGED
S4.005	S201	2	20.786	-0.039	0.000	0.01	0.0	17.5	OK
S4.006	S202	2	20.760	1.210	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	25	18.972	-0.313	0.000	0.06	0.0	12.5	OK
S10.000	S24	25	23.446	-0.134	0.000	0.03	0.0	1.2	OK

BAM Design Ltd		Page 64
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	
Micro Drainage		Network 2014.1.1

Summary Wizard of 2880 minute 100 year Winter I+30% 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 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 Storage Structures 1
 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 0.347
 Region England and Wales Cv (Summer) 0.810
 M5-60 (mm) 19.500 Cv (Winter) 0.840

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) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
 Return Period(s) (years) 100
 Climate Change (%) 30

PN	US/MH Name	Rank	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	0'flow (l/s)	Pipe Flow (l/s)	Status
S3.000	S27	26	20.682	-0.333	0.000	0.03	0.0	5.8	OK
S3.001	S28	26	19.960	-0.345	0.000	0.02	0.0	5.8	OK
S4.000	S5	25	23.776	0.286	0.000	0.01	0.0	0.6	SURCHARGED
S4.001	S6	25	23.775	1.540	0.000	0.05	0.0	2.1	FLOOD RISK
S4.002	S7	22	23.772	1.942	0.000	0.07	0.0	3.5	FLOOD RISK
S5.000	S101	20	23.771	1.393	0.000	0.01	0.0	12.3	FLOOD RISK
S5.001	S102	20	23.772	2.457	0.000	0.11	0.0	12.3	FLOOD RISK
S6.000	S8	22	23.773	1.128	0.000	0.06	0.0	2.4	FLOOD RISK
S6.001	S10	18	23.770	1.565	0.000	0.02	0.0	2.4	FLOOD RISK
S4.003	S11	18	23.769	2.724	0.000	0.31	0.0	5.3	FLOOD RISK
S4.004	S14	1	20.811	0.056	0.000	0.33	0.0	5.4	SURCHARGED
S7.000	S15	26	21.725	-0.180	0.000	0.09	0.0	3.5	OK
S7.001	S16	26	21.529	-0.176	0.000	0.11	0.0	4.3	OK
S7.002	S17	26	21.361	-0.174	0.000	0.12	0.0	6.1	OK
S8.000	S19	26	21.168	-0.122	0.000	0.08	0.0	1.3	OK
S7.003	S20	26	20.946	-0.224	0.000	0.15	0.0	7.4	OK
S7.004	S21	26	20.832	-0.268	0.000	0.03	0.0	7.4	OK
S9.000	S22	26	22.555	-0.135	0.000	0.02	0.0	0.6	OK
S9.001	S23	6	20.790	0.455	0.000	0.07	0.0	2.6	SURCHARGED

©1982-2014 XP Solutions

BAM Design Ltd		Page 65
Centrium, Griffiths Way St Albans Herts AL1 2RD		
Date 08/01/2016 13:31 File 4487 COMBINED.MDX	Designed by worton Checked by	

Micro Drainage Network 2014.1.1

Summary Wizard of 2880 minute 100 year Winter I+30% for Storm

PN	US/MH		Water	Surch'd Depth (m)	Flooded	Flow / O'flow		Pipe	Status
	Name	Rank	Level (m)		Volume (m³)	Cap.	(l/s)	Flow (l/s)	
S9.002	S26	1	20.790	0.945	0.000	0.08	0.0	2.5	SURCHARGED
S7.005	S25	1	20.792	1.062	0.000	0.21	0.0	9.9	SURCHARGED
S4.005	S201	1	20.793	-0.032	0.000	0.01	0.0	15.0	OK
S4.006	S202	1	20.762	1.212	0.000	0.24	0.0	6.0	SURCHARGED
S3.002	S1	26	18.967	-0.318	0.000	0.06	0.0	11.0	OK
S10.000	S24	26	23.445	-0.135	0.000	0.02	0.0	1.0	OK