Appendix V
Drainage Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.120	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results	**l/s**
QBAR Rural	4.9
QBAR Urban	4.9
Q1 year	4.1
Q1 year	4.1
Q30 years	9.6
Q100 years	12.6

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	0.190	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results	**l/s**
QBAR Rural	0.8
QBAR Urban	0.8
Q1 year	0.7
Q1 year	0.7
Q30 years	1.6
Q100 years	2.1

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.160	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results	**l/s**
QBAR Rural	5.1
QBAR Urban	5.1
Q1 year	4.2
Q1 year	4.2
Q30 years	10.0
Q100 years	13.1

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.028	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results	**l/s**
QBAR Rural	4.5
QBAR Urban	4.5
Q1 year	3.7
Q1 year	3.7
Q30 years	8.8
Q100 years	11.6

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.260	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results	**l/s**
QBAR Rural	5.5
QBAR Urban	5.5
Q1 year	4.6
Q1 year	4.6
Q30 years	10.8
Q100 years	14.2

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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	PIMP (%)	100
M5-60 (mm)	19.800	Add Flow / Climate Change (%)	0
Ratio R	0.400	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

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.728	4-8	0.502

Total Area Contributing (ha) = 1.230

Total Pipe Volume (m³) = 65.367

Network Design Table for Storm

« - 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)	Section Type	Auto Design
1.000	47.300	0.158	299.4	0.350	5.00	0.0	0.600	oo	-2	Pipe/Conduit	
1.001	52.600	0.692	76.0	0.190	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	37.920	0.094	403.4	0.230	5.00	0.0	0.600	oo	-1	Pipe/Conduit	
2.001	12.310	0.031	397.1	0.000	0.00	0.0	0.600	oo	-1	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.67	100.525	0.350	0.0	0.0	0.0	1.17	372.1	47.4
1.001	49.68	6.05	100.367	0.540	0.0	0.0	0.0	2.33	371.2	72.7
2.000	50.00	5.52	99.800	0.230	0.0	0.0	0.0	1.21	682.1	31.1
2.001	50.00	5.69	99.700	0.230	0.0	0.0	0.0	1.22	687.5	31.1

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.002	8.400	0.041	204.9	0.029	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	24.900	0.121	205.8	0.027	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	6.400	0.031	206.5	0.169	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	13.200	0.064	206.3	0.022	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	19.900	0.097	205.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	17.000	0.095	178.9	0.071	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	18.200	0.102	178.4	0.071	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	10.300	0.058	177.6	0.071	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	9.300	0.062	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (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)
1.002	49.30	6.15	99.675	0.799	0.0	0.0	0.0	1.42	225.3	106.7
1.003	48.21	6.44	99.634	0.826	0.0	0.0	0.0	1.41	224.8	107.9
1.004	47.94	6.52	99.512	0.995	0.0	0.0	0.0	1.41	224.4	129.2
1.005	47.39	6.67	99.481	1.017	0.0	0.0	0.0	1.41	224.5	130.5
1.006	46.59	6.91	99.417	1.017	0.0	0.0	0.0	1.42	225.1	130.5
3.000	50.00	5.29	99.575	0.071	0.0	0.0	0.0	0.97	38.7	9.6
3.001	50.00	5.60	99.479	0.142	0.0	0.0	0.0	0.98	38.8	19.2
3.002	50.00	5.78	99.377	0.213	0.0	0.0	0.0	0.98	38.9	28.8
1.007	45.97	7.10	99.310	1.230	0.0	0.0	0.0	0.82	14.5«	153.1

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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	0.350	0.350	0.350
1.001	-	-	100	0.190	0.190	0.190
2.000	-	-	100	0.230	0.230	0.230
2.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.029	0.029	0.029
1.003	-	-	100	0.027	0.027	0.027
1.004	-	-	100	0.169	0.169	0.169
1.005	-	-	100	0.022	0.022	0.022
1.006	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.071	0.071	0.071
3.001	-	-	100	0.071	0.071	0.071
3.002	-	-	100	0.071	0.071	0.071
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.230	1.230	1.230

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)
1.007		100.300	99.248	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.800	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 4, DS/PN: 2.001, Volume (m³): 30.9

Unit Reference	MD-SHE-0296-5000-0900-5000
Design Head (m)	0.900
Design Flow (l/s)	50.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	296
Invert Level (m)	99.700
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	0.900	50.0
Flush-Flo™	0.434	50.0
Kick-Flo®	0.727	45.1
Mean Flow over Head Range	-	39.4

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	9.1	1.200	57.4	3.000	89.5	7.000	135.4
0.200	30.4	1.400	61.9	3.500	96.5	7.500	140.0
0.300	48.5	1.600	66.0	4.000	103.0	8.000	144.5
0.400	49.9	1.800	69.9	4.500	109.1	8.500	148.9
0.500	49.7	2.000	73.5	5.000	114.8	9.000	153.1
0.600	48.6	2.200	77.0	5.500	120.3	9.500	156.1
0.800	47.2	2.400	80.3	6.000	125.5		
1.000	52.6	2.600	83.5	6.500	130.5		

Hydro-Brake® Optimum Manhole: 13, DS/PN: 1.007, Volume (m³): 4.7

Unit Reference	MD-SHE-0107-5000-0900-5000
Design Head (m)	0.900
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	99.310
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: 13, DS/PN: 1.007, Volume (m³): 4.7

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	5.0
Flush-Flo™	0.271	5.0
Kick-Flo®	0.590	4.1
Mean Flow over Head Range	-	4.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	1.200	5.7	3.000	8.8	7.000	13.1
0.200	4.9	1.400	6.1	3.500	9.4	7.500	13.6
0.300	5.0	1.600	6.5	4.000	10.1	8.000	14.0
0.400	4.9	1.800	6.9	4.500	10.6	8.500	14.4
0.500	4.6	2.000	7.2	5.000	11.2	9.000	14.8
0.600	4.1	2.200	7.6	5.500	11.7	9.500	15.2
0.800	4.7	2.400	7.9	6.000	12.2		
1.000	5.2	2.600	8.2	6.500	12.7		

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Storage Structures for Storm

Tank or Pond Manhole: 13, DS/PN: 1.007

Invert Level (m) 99.310

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	850.0	0.900	1515.0

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	11.133	14.091	0.000	25.224
1.001	2	11.048	7.889	0.000	18.937
2.000	3	11.168	19.747	0.000	30.915
2.001	4	11.168	5.265	0.000	16.433
1.002	5	11.133	0.990	0.000	12.123
1.003	6	2.242	3.745	0.000	5.987
1.004	7	2.259	0.803	0.000	3.062
1.005	8	2.254	1.885	0.000	4.139
1.006	9	2.254	2.950	0.000	5.205
3.000	10	1.612	0.628	0.000	2.240
3.001	11	1.720	0.676	0.000	2.396
3.002	12	1.836	0.359	0.000	2.194
1.007	13	1.417	0.142	1186.287	1187.846
Total		71.245	59.170	1186.287	1316.701

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1 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 * 10m³/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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	1	+0%	100/15 Summer			
1.001	2	15 Winter	1	+0%	100/15 Summer			
2.000	3	30 Winter	1	+0%	100/15 Summer			
2.001	4	30 Winter	1	+0%	30/15 Winter	100/15 Winter		
1.002	5	15 Winter	1	+0%	30/15 Summer			
1.003	6	15 Winter	1	+0%	30/15 Summer			
1.004	7	15 Winter	1	+0%	30/15 Summer			
1.005	8	15 Winter	1	+0%	30/15 Summer			
1.006	9	15 Winter	1	+0%	30/15 Winter			
3.000	10	15 Winter	1	+0%	30/15 Summer			
3.001	11	15 Winter	1	+0%	30/15 Summer			
3.002	12	15 Winter	1	+0%	30/15 Summer			
1.007	13	480 Winter	1	+0%	1/120 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	100.633	-0.342	0.000	0.14		46.9	OK	

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	2	100.503	-0.314	0.000	0.20		66.8	OK	
2.000	3	100.003	-0.397	0.000	0.04		21.3	OK	
2.001	4	100.001	-0.299	0.000	0.04		16.7	OK	3
1.002	5	99.898	-0.227	0.000	0.49		73.3	OK	
1.003	6	99.845	-0.239	0.000	0.40		75.3	OK	
1.004	7	99.780	-0.182	0.000	0.65		89.8	OK	
1.005	8	99.720	-0.211	0.000	0.55		91.9	OK	
1.006	9	99.648	-0.219	0.000	0.52		92.1	OK	
3.000	10	99.657	-0.143	0.000	0.28		9.6	OK	
3.001	11	99.594	-0.110	0.000	0.51		17.9	OK	
3.002	12	99.530	-0.072	0.000	0.79		25.8	OK	
1.007	13	99.491	0.031	0.000	0.38		4.9	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 * 10m³/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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	30	+0%	100/15 Summer			
1.001	2	15 Winter	30	+0%	100/15 Summer			
2.000	3	15 Winter	30	+0%	100/15 Summer			
2.001	4	15 Winter	30	+0%	30/15 Winter	100/15 Winter		
1.002	5	15 Winter	30	+0%	30/15 Summer			
1.003	6	15 Winter	30	+0%	30/15 Summer			
1.004	7	15 Winter	30	+0%	30/15 Summer			
1.005	8	15 Winter	30	+0%	30/15 Summer			
1.006	9	15 Winter	30	+0%	30/15 Winter			
3.000	10	15 Winter	30	+0%	30/15 Summer			
3.001	11	15 Winter	30	+0%	30/15 Summer			
3.002	12	15 Winter	30	+0%	30/15 Summer			
1.007	13	480 Winter	30	+0%	1/120 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	100.707	-0.268	0.000	0.34		115.2	OK	

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	2	100.597	-0.220	0.000	0.51		173.6	OK	
2.000	3	100.400	0.000	0.000	0.11		63.2	OK	
2.001	4	100.388	0.088	0.000	0.12		48.5	SURCHARGED	3
1.002	5	100.256	0.131	0.000	1.09		162.5	SURCHARGED	
1.003	6	100.212	0.128	0.000	0.88		165.7	SURCHARGED	
1.004	7	100.122	0.160	0.000	1.40		193.1	SURCHARGED	
1.005	8	99.998	0.067	0.000	1.18		197.1	SURCHARGED	
1.006	9	99.870	0.003	0.000	1.12		197.2	SURCHARGED	
3.000	10	100.003	0.203	0.000	0.67		23.2	SURCHARGED	
3.001	11	99.960	0.256	0.000	1.29		44.8	SURCHARGED	
3.002	12	99.791	0.189	0.000	2.07		67.3	SURCHARGED	
1.007	13	99.729	0.269	0.000	0.39		5.0	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 * 10m³/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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	100	+40%	100/15 Summer			
1.001	2	15 Winter	100	+40%	100/15 Summer			
2.000	3	15 Winter	100	+40%	100/15 Summer			
2.001	4	15 Winter	100	+40%	30/15 Winter	100/15 Winter		
1.002	5	15 Winter	100	+40%	30/15 Summer			
1.003	6	15 Winter	100	+40%	30/15 Summer			
1.004	7	15 Winter	100	+40%	30/15 Summer			
1.005	8	15 Winter	100	+40%	30/15 Summer			
1.006	9	960 Winter	100	+40%	30/15 Winter			
3.000	10	15 Winter	100	+40%	30/15 Summer			
3.001	11	15 Winter	100	+40%	30/15 Summer			
3.002	12	15 Winter	100	+40%	30/15 Summer			
1.007	13	960 Winter	100	+40%	1/120 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	101.350	0.375	0.000	0.56		188.9	SURCHARGED	

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	2	101.312	0.495	0.000	0.67		226.1	SURCHARGED	
2.000	3	101.294	0.894	0.000	0.17		98.9	FLOOD RISK	
2.001	4	101.286	0.986	5.643	0.12		49.9	FLOOD	3
1.002	5	101.058	0.933	0.000	1.66		248.7	FLOOD RISK	
1.003	6	100.872	0.788	0.000	1.36		256.4	SURCHARGED	
1.004	7	100.657	0.695	0.000	2.20		302.7	SURCHARGED	
1.005	8	100.354	0.423	0.000	1.85		309.1	SURCHARGED	
1.006	9	100.065	0.198	0.000	0.22		37.9	SURCHARGED	
3.000	10	100.901	1.101	0.000	1.18		40.8	FLOOD RISK	
3.001	11	100.776	1.072	0.000	2.21		76.9	FLOOD RISK	
3.002	12	100.269	0.667	0.000	3.53		115.0	SURCHARGED	
1.007	13	100.063	0.603	0.000	0.39		5.0	FLOOD RISK	

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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	PIMP (%)	100
M5-60 (mm)	19.800	Add Flow / Climate Change (%)	0
Ratio R	0.400	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

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.058	4-8	0.026

Total Area Contributing (ha) = 0.084

Total Pipe Volume (m³) = 13.440

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	14.850	0.050	297.0	0.035	5.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	29.820	0.099	301.2	0.022	5.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	16.320	0.054	302.2	0.022	5.00	0.0	0.600	o	450	Pipe/Conduit	
3.001	20.480	0.068	301.2	0.005	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	99.650	0.035	0.0	0.0	0.0	1.17	186.8	4.7
2.000	50.00	5.43	99.700	0.022	0.0	0.0	0.0	1.17	185.5	3.0
3.000	50.00	5.23	99.720	0.022	0.0	0.0	0.0	1.16	185.2	3.0
3.001	50.00	5.53	99.660	0.027	0.0	0.0	0.0	1.17	185.5	3.7

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.001	12.130	0.040	303.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.001	50.00	5.80	99.600	0.084	0.0	0.0	0.0	0.75	29.6	11.4

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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	0.035	0.035	0.035
2.000	-	-	100	0.022	0.022	0.022
3.000	-	-	100	0.022	0.022	0.022
3.001	-	-	100	0.005	0.005	0.005
1.001	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.084	0.084	0.084

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)
1.001		101.000	99.560	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.800	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 5, DS/PN: 1.001, Volume (m³): 11.9

Unit Reference	MD-SHE-0107-5000-0900-5000
Design Head (m)	0.900
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	99.600
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	5.0
Flush-Flo™	0.271	5.0
Kick-Flo®	0.590	4.1
Mean Flow over Head Range	-	4.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	1.200	5.7	3.000	8.8	7.000	13.1
0.200	4.9	1.400	6.1	3.500	9.4	7.500	13.6
0.300	5.0	1.600	6.5	4.000	10.1	8.000	14.0
0.400	4.9	1.800	6.9	4.500	10.6	8.500	14.4
0.500	4.6	2.000	7.2	5.000	11.2	9.000	14.8
0.600	4.1	2.200	7.6	5.500	11.7	9.500	15.2
0.800	4.7	2.400	7.9	6.000	12.2		
1.000	5.2	2.600	8.2	6.500	12.7		

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	2.147	2.147	0.000	4.294
2.000	2	2.147	4.528	0.000	6.675
3.000	3	2.147	2.381	0.000	4.528
3.001	4	2.147	3.042	0.000	5.190
1.001	5	2.147	0.432	0.000	2.579

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Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
Total		10.735	12.530	0.000	23.265

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1 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 * 10m³/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 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%	100/15 Summer				99.762
2.000	2	15 Winter	1	+0%	100/15 Summer				99.764
3.000	3	15 Winter	1	+0%	100/15 Summer				99.770
3.001	4	15 Winter	1	+0%	100/15 Summer				99.762
1.001	5	15 Winter	1	+0%	30/15 Summer				99.761

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.338	0.000	0.03		4.4	OK	
2.000	2	-0.386	0.000	0.02		2.8	OK	
3.000	3	-0.400	0.000	0.02		2.9	OK	
3.001	4	-0.348	0.000	0.02		2.9	OK	
1.001	5	-0.064	0.000	0.18		4.6	OK	

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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 * 10m³/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 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Winter	30	+0%	100/15 Summer				99.953
2.000	2	30 Winter	30	+0%	100/15 Summer				99.953
3.000	3	30 Winter	30	+0%	100/15 Summer				99.954
3.001	4	30 Winter	30	+0%	100/15 Summer				99.953
1.001	5	30 Winter	30	+0%	30/15 Summer				99.953

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.147	0.000	0.06		8.4	OK	
2.000	2	-0.197	0.000	0.03		5.0	OK	
3.000	3	-0.216	0.000	0.04		5.1	OK	
3.001	4	-0.157	0.000	0.02		3.6	OK	
1.001	5	0.128	0.000	0.20		5.0	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 * 10m³/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 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	60 Winter	100	+40%	100/15 Summer				101.067
2.000	2	60 Winter	100	+40%	100/15 Summer				101.067
3.000	3	60 Winter	100	+40%	100/15 Summer				101.067
3.001	4	60 Winter	100	+40%	100/15 Summer				101.067
1.001	5	60 Winter	100	+40%	30/15 Summer				101.066

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.967	0.000	0.07		9.9	FLOOD RISK	
2.000	2	0.917	0.000	0.04		5.9	FLOOD RISK	
3.000	3	0.897	0.000	0.04		5.9	FLOOD RISK	
3.001	4	0.957	0.000	0.02		3.2	FLOOD RISK	
1.001	5	1.241	0.000	0.24		6.1	FLOOD RISK	

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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	PIMP (%)	100
M5-60 (mm)	19.800	Add Flow / Climate Change (%)	0
Ratio R	0.400	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)	0.900
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

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.000	8-12	0.117	12-16	0.649	16-20	0.327	20-24	0.000

Total Area Contributing (ha) = 1.093

Total Pipe Volume (m³) = 446.777

Network Design Table for Storm

« - 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)	Section Type	Auto Design
S1.000	68.184	0.280	243.5	0.198	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	13.505	0.060	225.1	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	36.092	0.210	171.9	0.121	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	49.36	6.13	99.800	0.198	0.0	0.0	0.0	1.00	70.9	26.5
S1.001	48.55	6.35	99.520	0.220	0.0	0.0	0.0	1.04	73.8	28.9
S2.000	50.00	5.50	99.650	0.121	0.0	0.0	0.0	1.20	84.6	16.4

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.002	15.798	0.055	287.2	0.022	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.003	63.027	0.150	420.2	0.102	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	37.200	0.445	83.6	0.094	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	56.269	0.455	123.7	0.121	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	52.620	0.150	350.8	0.176	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	95.362	0.195	489.0	0.039	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	29.648	0.150	197.7	0.099	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.001	37.503	0.200	187.5	0.099	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.002	65.845	0.100	658.5	0.000	0.00	0.0	0.600	\/	-4	Pipe/Conduit	
S1.007	138.047	0.100	1380.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.002	47.66	6.60	99.385	0.363	0.0	0.0	0.0	1.06	117.5	46.9
S1.003	43.83	7.79	99.330	0.465	0.0	0.0	0.0	0.88	96.9	55.2
S3.000	50.00	5.36	99.700	0.094	0.0	0.0	0.0	1.72	121.6	12.7
S1.004	42.22	8.37	99.180	0.680	0.0	0.0	0.0	1.63	179.8	77.7
S1.005	39.96	9.28	98.725	0.856	0.0	0.0	0.0	0.96	106.2	92.6
S1.006	36.11	11.24	98.575	0.895	0.0	0.0	0.0	0.81	89.7«	92.6
S4.000	50.00	5.44	98.750	0.099	0.0	0.0	0.0	1.11	78.8	13.4
S4.001	49.92	5.99	98.600	0.198	0.0	0.0	0.0	1.14	80.9	26.8
S4.002	48.10	6.47	98.400	0.198	0.0	0.0	0.0	2.27	13677.5	26.8
S1.007	25.79	20.01	98.300	1.093	0.0	0.0	0.0	0.26	4.6«	92.6

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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	0.198	0.198	0.198
1.001	-	-	100	0.022	0.022	0.022
2.000	-	-	100	0.121	0.121	0.121
1.002	-	-	100	0.022	0.022	0.022
1.003	-	-	100	0.102	0.102	0.102
3.000	-	-	100	0.094	0.094	0.094
1.004	-	-	100	0.121	0.121	0.121
1.005	-	-	100	0.176	0.176	0.176
1.006	-	-	100	0.039	0.039	0.039
4.000	-	-	100	0.099	0.099	0.099
4.001	-	-	100	0.099	0.099	0.099
4.002	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.093	1.093	1.093

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.007	S	99.000	98.200	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

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)	19.800	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SS313, DS/PN: S1.007, Volume (m³): 417.6

Unit Reference	MD-SHE-0108-5100-0900-5100
Design Head (m)	0.900
Design Flow (l/s)	5.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	108
Invert Level (m)	98.300
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	0.900	5.1
Flush-Flo™	0.269	5.1
Kick-Flo®	0.589	4.2
Mean Flow over Head Range	-	4.4

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

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	3.7	1.200	5.8	3.000	9.0	7.000	13.4
0.200	5.0	1.400	6.3	3.500	9.6	7.500	13.9
0.300	5.1	1.600	6.7	4.000	10.3	8.000	14.3
0.400	5.0	1.800	7.0	4.500	10.9	8.500	14.7
0.500	4.7	2.000	7.4	5.000	11.4	9.000	15.1
0.600	4.2	2.200	7.7	5.500	11.9	9.500	15.5
0.800	4.8	2.400	8.1	6.000	12.5		
1.000	5.4	2.600	8.4	6.500	12.9		

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Storage Structures for Storm

Swale Manhole: SS313, DS/PN: S1.007

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	50.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	1000.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	98.300	Cap Infiltration Depth (m)	0.000
Base Width (m)	4.0	Include Swale Volume	Yes

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S1.000	SS301	1.696	4.735	0.000	6.431
S1.001	SS302	1.674	0.864	0.000	2.538
S2.000	SS303	1.696	2.461	0.000	4.158
S1.002	SS304	2.312	1.596	0.000	3.907
S1.003	SS305	2.247	6.812	0.000	9.059
S3.000	SS306	1.357	2.539	0.000	3.897
S1.004	SS307	2.033	6.066	0.000	8.098
S1.005	SS308	2.040	5.663	0.000	7.702
S1.006	SS309	1.825	9.906	0.000	11.731
S4.000	SS310	1.357	2.011	0.000	3.368
S4.001	SS311	1.357	2.255	0.000	3.612
S4.002	SS312	86.394	337.022	0.000	423.416
S1.007	SS313	70.686	2.351	289.875	362.912
Total		176.674	384.280	289.875	850.829

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1 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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS301	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.001	SS302	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S2.000	SS303	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
S1.002	SS304	15 Winter	1	+0%	30/15 Summer			
S1.003	SS305	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S3.000	SS306	15 Winter	1	+0%	100/15 Summer			
S1.004	SS307	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.005	SS308	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.006	SS309	15 Winter	1	+0%	30/15 Summer			
S4.000	SS310	15 Winter	1	+0%	100/15 Summer			
S4.001	SS311	15 Winter	1	+0%	100/15 Summer			
S4.002	SS312	360 Winter	1	+0%				
S1.007	SS313	360 Winter	1	+0%	1/15 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS301	99.933	-0.167	0.000	0.38		25.6	OK	5

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.001	SS302	99.662	-0.158	0.000	0.46		27.8	OK	6
S2.000	SS303	99.744	-0.206	0.000	0.21		16.4	OK	1
S1.002	SS304	99.582	-0.178	0.000	0.48		45.1	OK	
S1.003	SS305	99.542	-0.163	0.000	0.58		52.7	OK	5
S3.000	SS306	99.768	-0.232	0.000	0.11		12.7	OK	
S1.004	SS307	99.353	-0.202	0.000	0.43		72.5	OK	6
S1.005	SS308	99.002	-0.098	0.000	0.87		85.8	OK	6
S1.006	SS309	98.882	-0.068	0.000	0.99		85.4	OK	
S4.000	SS310	98.839	-0.211	0.000	0.19		13.4	OK	
S4.001	SS311	98.719	-0.181	0.000	0.33		24.6	OK	
S4.002	SS312	98.553	-0.747	0.000	0.00		2.2	OK	
S1.007	SS313	98.553	0.103	0.000	0.92		5.0	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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS301	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.001	SS302	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S2.000	SS303	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
S1.002	SS304	15 Winter	30	+0%	30/15 Summer			
S1.003	SS305	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S3.000	SS306	15 Winter	30	+0%	100/15 Summer			
S1.004	SS307	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.005	SS308	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.006	SS309	15 Winter	30	+0%	30/15 Summer			
S4.000	SS310	15 Winter	30	+0%	100/15 Summer			
S4.001	SS311	480 Winter	30	+0%	100/15 Summer			
S4.002	SS312	480 Winter	30	+0%				
S1.007	SS313	480 Winter	30	+0%	1/15 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS301	100.320	0.220	0.000	0.87		59.3	SURCHARGED	5

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.001	SS302	100.210	0.390	0.000	0.83		50.3	SURCHARGED	6
S2.000	SS303	100.201	0.251	0.000	0.49		38.3	SURCHARGED	1
S1.002	SS304	100.170	0.410	0.000	0.82		78.0	SURCHARGED	
S1.003	SS305	100.128	0.423	0.000	1.01		92.0	SURCHARGED	5
S3.000	SS306	99.997	-0.003	0.000	0.28		31.2	OK	
S1.004	SS307	99.974	0.419	0.000	0.75		125.5	SURCHARGED	6
S1.005	SS308	99.719	0.619	0.000	1.51		149.1	SURCHARGED	6
S1.006	SS309	99.368	0.418	0.000	1.74		150.1	SURCHARGED	
S4.000	SS310	98.895	-0.155	0.000	0.46		32.8	OK	
S4.001	SS311	98.826	-0.074	0.000	0.10		7.3	OK	
S4.002	SS312	98.826	-0.474	0.000	0.00		3.5	OK	
S1.007	SS313	98.826	0.376	0.000	0.93		5.1	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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS301	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.001	SS302	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S2.000	SS303	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
S1.002	SS304	15 Winter	100	+40%	30/15 Summer			
S1.003	SS305	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S3.000	SS306	15 Winter	100	+40%	100/15 Summer			
S1.004	SS307	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.005	SS308	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.006	SS309	15 Winter	100	+40%	30/15 Summer			
S4.000	SS310	15 Winter	100	+40%	100/15 Summer			
S4.001	SS311	960 Winter	100	+40%	100/15 Summer			
S4.002	SS312	960 Winter	100	+40%				
S1.007	SS313	960 Winter	100	+40%	1/15 Winter			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS301	101.306	1.206	6.444	1.03		69.8	FLOOD	5

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.001	SS302	101.012	1.192	11.952	1.57		95.5	FLOOD	6
S2.000	SS303	101.150	1.200	0.067	0.85		66.4	FLOOD	1
S1.002	SS304	100.981	1.221	0.000	1.14		107.8	FLOOD RISK	
S1.003	SS305	100.905	1.200	5.262	1.39		126.7	FLOOD	5
S3.000	SS306	100.722	0.722	0.000	0.49		55.3	FLOOD RISK	
S1.004	SS307	100.614	1.059	13.618	0.99		165.7	FLOOD	6
S1.005	SS308	100.172	1.072	22.255	1.86		183.9	FLOOD	6
S1.006	SS309	99.739	0.789	0.000	2.18		187.3	FLOOD RISK	
S4.000	SS310	99.278	0.228	0.000	0.81		58.1	SURCHARGED	
S4.001	SS311	99.191	0.291	0.000	0.10		7.2	SURCHARGED	
S4.002	SS312	99.190	-0.110	0.000	0.00		4.0	OK	
S1.007	SS313	99.190	0.740	0.000	0.93		5.1	FLOOD RISK	

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Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.149	4-8	0.641	8-12	0.335	12-16	0.004

Total Area Contributing (ha) = 1.130

Total Pipe Volume (m^3) = 68.126

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Existing Network Details for Storm

- Indicates pipe length does not match coordinates

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
1.000	24.747	0.092	269.0	0.100	5.00	0.0	0.600	o	300	Pipe/Conduit
1.001	10.374	0.034	305.1	0.100	0.00	0.0	0.600	o	300	Pipe/Conduit
1.002	63.472	0.211	300.8	0.100	0.00	0.0	0.600	o	300	Pipe/Conduit
1.003	54.371	0.181	300.4	0.190	0.00	0.0	0.600	o	375	Pipe/Conduit
1.004	59.753	0.199	300.3	0.140	0.00	0.0	0.600	o	375	Pipe/Conduit
2.000	32.700#	0.046	710.9	0.070	5.00	0.0	0.600	o	300	Pipe/Conduit
2.001	18.700#	0.060	311.7	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit
2.002	29.600#	0.108	274.1	0.090	0.00	0.0	0.600	o	300	Pipe/Conduit
1.005	39.571	0.088	449.7	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit
1.006	30.766	0.068	452.4	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit
1.007	27.274	0.061	447.1	0.020	0.00	0.0	0.600	o	450	Pipe/Conduit
1.008	27.932	0.062	450.5	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit
1.009	28.965	0.208	139.3	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit
3.000	16.700#	0.053	315.1	0.020	5.00	0.0	0.600	o	300	Pipe/Conduit
3.001	15.213	0.057	266.9	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit
3.002	22.249	0.074	300.7	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit
3.003	21.180	0.071	298.3	0.100	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	100.000	0.100	0.0	0.95	67.4
1.001	99.908	0.200	0.0	0.89	63.3
1.002	99.874	0.300	0.0	0.90	63.7
1.003	99.587	0.490	0.0	1.04	114.9
1.004	99.406	0.630	0.0	1.04	114.9
2.000	99.570	0.070	0.0	0.58	41.2
2.001	99.450	0.090	0.0	0.89	62.6
2.002	99.390	0.180	0.0	0.94	66.8
1.005	99.132	0.850	0.0	0.95	151.4
1.006	99.044	0.890	0.0	0.95	151.0
1.007	98.975	0.910	0.0	0.95	151.9
1.008	98.915	0.950	0.0	0.95	151.3
1.009	98.853	0.960	0.0	1.72	273.7
3.000	99.100	0.020	0.0	0.88	62.2
3.001	98.916	0.040	0.0	1.10	122.0
3.002	98.866	0.070	0.0	1.04	114.8
3.003	98.791	0.170	0.0	1.04	115.3

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Existing Network Details 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
1.010	47.085	0.170	277.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit
1.011	22.818	0.130	175.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.010	98.570	1.130	0.0	1.34	290.3
1.011	98.350	1.130	0.0	0.76	13.4

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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	0.100	0.100	0.100
1.001	-	-	100	0.100	0.100	0.100
1.002	-	-	100	0.100	0.100	0.100
1.003	-	-	100	0.190	0.190	0.190
1.004	-	-	100	0.140	0.140	0.140
2.000	-	-	100	0.070	0.070	0.070
2.001	-	-	100	0.020	0.020	0.020
2.002	-	-	100	0.090	0.090	0.090
1.005	-	-	100	0.040	0.040	0.040
1.006	-	-	100	0.040	0.040	0.040
1.007	-	-	100	0.020	0.020	0.020
1.008	-	-	100	0.040	0.040	0.040
1.009	-	-	100	0.010	0.010	0.010
3.000	-	-	100	0.020	0.020	0.020
3.001	-	-	100	0.020	0.020	0.020
3.002	-	-	100	0.030	0.030	0.030
3.003	-	-	100	0.100	0.100	0.100
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.130	1.130	1.130

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)
1.011	Ditch	98.700	98.220	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	19.800
Return Period (years)	1	Ratio R	0.400
Region	England and Wales	Profile Type	Summer

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Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30
Cv (Winter) 0.840

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 19, DS/PN: 1.011, Volume (m³): 13.0

Unit Reference	MD-SHE-0107-5000-0900-5000
Design Head (m)	0.900
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	98.350
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	0.900	5.0
Flush-Flo™	0.271	5.0
Kick-Flo®	0.590	4.1
Mean Flow over Head Range	-	4.3

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

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	3.6	1.200	5.7	3.000	8.8	7.000	13.1
0.200	4.9	1.400	6.1	3.500	9.4	7.500	13.6
0.300	5.0	1.600	6.5	4.000	10.1	8.000	14.0
0.400	4.9	1.800	6.9	4.500	10.6	8.500	14.4
0.500	4.6	2.000	7.2	5.000	11.2	9.000	14.8
0.600	4.1	2.200	7.6	5.500	11.7	9.500	15.2
0.800	4.7	2.400	7.9	6.000	12.2		
1.000	5.2	2.600	8.2	6.500	12.7		

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Storage Structures for Storm

Tank or Pond Manhole: 19, DS/PN: 1.011

Invert Level (m) 98.350

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	950.0	0.900	1558.0

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	1.696	1.664	0.000	3.361
1.001	2	1.801	0.648	0.000	2.449
1.002	3	1.839	4.396	0.000	6.235
1.003	4	3.168	5.856	0.000	9.024
1.004	5	2.568	6.450	0.000	9.018
2.000	6	1.696	2.227	0.000	3.923
2.001	7	1.696	1.237	0.000	2.933
2.002	8	1.538	2.002	0.000	3.540
1.005	9	2.316	6.079	0.000	8.395
1.006	10	2.356	4.678	0.000	7.034
1.007	11	2.363	4.123	0.000	6.486
1.008	12	2.362	4.228	0.000	6.589
1.009	13	2.362	4.380	0.000	6.742
3.000	14	1.696	1.090	0.000	2.787
3.001	15	2.254	1.531	0.000	3.786
3.002	16	2.254	2.308	0.000	4.563
3.003	17	2.256	2.182	0.000	4.438
1.010	18	3.048	9.868	0.000	12.916
1.011	19	3.093	0.390	2441.678	2445.161
Total		42.363	65.339	2441.678	2549.381

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1 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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.001	2	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.002	3	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.003	4	15 Winter	1	+0%	30/15 Summer			
1.004	5	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
2.000	6	15 Winter	1	+0%	100/15 Summer			
2.001	7	15 Winter	1	+0%	30/15 Winter			
2.002	8	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.005	9	15 Winter	1	+0%	30/15 Summer			
1.006	10	15 Winter	1	+0%	30/15 Summer			
1.007	11	15 Winter	1	+0%	30/15 Summer			
1.008	12	15 Winter	1	+0%	30/15 Summer			
1.009	13	15 Winter	1	+0%	100/15 Summer			
3.000	14	15 Winter	1	+0%				
3.001	15	15 Winter	1	+0%				
3.002	16	15 Winter	1	+0%				
3.003	17	15 Winter	1	+0%	100/15 Winter			
1.010	18	15 Winter	1	+0%	100/15 Summer			
1.011	19	480 Winter	1	+0%	1/360 Winter			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	100.108	-0.192	0.000	0.22		13.4	OK	5
1.001	2	100.068	-0.140	0.000	0.50		24.6	OK	5
1.002	3	100.041	-0.133	0.000	0.56		34.0	OK	4
1.003	4	99.776	-0.186	0.000	0.49		52.5	OK	
1.004	5	99.617	-0.164	0.000	0.60		64.0	OK	3
2.000	6	99.676	-0.194	0.000	0.26		9.6	OK	
2.001	7	99.555	-0.195	0.000	0.22		11.7	OK	
2.002	8	99.515	-0.175	0.000	0.36		21.5	OK	2
1.005	9	99.402	-0.180	0.000	0.61		82.2	OK	
1.006	10	99.326	-0.168	0.000	0.63		82.1	OK	
1.007	11	99.254	-0.171	0.000	0.63		81.6	OK	
1.008	12	99.179	-0.186	0.000	0.64		82.6	OK	
1.009	13	99.038	-0.265	0.000	0.35		82.8	OK	
3.000	14	99.144	-0.256	0.000	0.05		2.7	OK	
3.001	15	98.979	-0.312	0.000	0.05		5.1	OK	
3.002	16	98.949	-0.292	0.000	0.09		8.4	OK	
3.003	17	98.905	-0.261	0.000	0.20		19.5	OK	
1.010	18	98.784	-0.311	0.000	0.35		89.8	OK	
1.011	19	98.504	0.004	0.000	0.37		4.7	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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.001	2	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.002	3	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.003	4	15 Winter	30	+0%	30/15 Summer			
1.004	5	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
2.000	6	15 Winter	30	+0%	100/15 Summer			
2.001	7	15 Winter	30	+0%	30/15 Winter			
2.002	8	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.005	9	15 Winter	30	+0%	30/15 Summer			
1.006	10	15 Winter	30	+0%	30/15 Summer			
1.007	11	15 Winter	30	+0%	30/15 Summer			
1.008	12	15 Winter	30	+0%	30/15 Summer			
1.009	13	15 Winter	30	+0%	100/15 Summer			
3.000	14	15 Winter	30	+0%				
3.001	15	15 Winter	30	+0%				
3.002	16	15 Winter	30	+0%				
3.003	17	15 Winter	30	+0%	100/15 Winter			
1.010	18	30 Winter	30	+0%	100/15 Summer			
1.011	19	480 Winter	30	+0%	1/360 Winter			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	100.677	0.377	0.000	0.46		27.6	SURCHARGED	5
1.001	2	100.648	0.440	0.000	1.11		54.7	SURCHARGED	5
1.002	3	100.613	0.439	0.000	1.28		77.7	SURCHARGED	4
1.003	4	100.287	0.325	0.000	1.11		118.3	SURCHARGED	
1.004	5	100.073	0.292	0.000	1.32		141.6	SURCHARGED	3
2.000	6	99.810	-0.060	0.000	0.63		22.9	OK	
2.001	7	99.796	0.046	0.000	0.47		25.3	SURCHARGED	
2.002	8	99.787	0.097	0.000	0.85		51.8	SURCHARGED	2
1.005	9	99.759	0.177	0.000	1.28		172.6	SURCHARGED	
1.006	10	99.624	0.130	0.000	1.33		173.5	SURCHARGED	
1.007	11	99.509	0.084	0.000	1.34		172.8	SURCHARGED	
1.008	12	99.397	0.032	0.000	1.34		173.3	SURCHARGED	
1.009	13	99.144	-0.159	0.000	0.74		174.4	OK	
3.000	14	99.171	-0.229	0.000	0.13		6.7	OK	
3.001	15	99.045	-0.246	0.000	0.14		13.4	OK	
3.002	16	99.030	-0.211	0.000	0.24		23.7	OK	
3.003	17	99.001	-0.165	0.000	0.58		57.0	OK	
1.010	18	98.905	-0.190	0.000	0.73		187.9	OK	
1.011	19	98.710	0.210	0.000	0.39		5.0	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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
1.001	2	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
1.002	3	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
1.003	4	15 Winter	100	+40%	30/15 Summer			
1.004	5	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
2.000	6	15 Winter	100	+40%	100/15 Summer			
2.001	7	15 Winter	100	+40%	30/15 Winter			
2.002	8	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
1.005	9	15 Winter	100	+40%	30/15 Summer			
1.006	10	15 Winter	100	+40%	30/15 Summer			
1.007	11	15 Winter	100	+40%	30/15 Summer			
1.008	12	30 Winter	100	+40%	30/15 Summer			
1.009	13	30 Winter	100	+40%	100/15 Summer			
3.000	14	30 Winter	100	+40%				
3.001	15	30 Winter	100	+40%				
3.002	16	30 Winter	100	+40%				
3.003	17	30 Winter	100	+40%	100/15 Winter			
1.010	18	30 Winter	100	+40%	100/15 Summer			
1.011	19	960 Winter	100	+40%	1/360 Winter			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	101.516	1.216	15.511	1.93		116.2	FLOOD	5
1.001	2	101.512	1.304	12.050	2.26		111.8	FLOOD	5
1.002	3	101.506	1.332	6.277	1.80		109.6	FLOOD	4
1.003	4	101.572	1.610	0.000	1.50		160.2	FLOOD RISK	
1.004	5	101.202	1.421	2.053	1.94		208.8	FLOOD	3
2.000	6	100.834	0.964	0.000	0.89		32.3	FLOOD RISK	
2.001	7	100.791	1.041	0.000	0.67		36.5	FLOOD RISK	
2.002	8	100.751	1.061	1.088	1.12		67.8	FLOOD	2
1.005	9	100.678	1.096	0.000	2.08		280.3	FLOOD RISK	
1.006	10	100.392	0.898	0.000	2.18		283.4	FLOOD RISK	
1.007	11	100.103	0.678	0.000	2.21		284.6	SURCHARGED	
1.008	12	99.817	0.452	0.000	2.23		286.9	SURCHARGED	
1.009	13	99.504	0.201	0.000	1.23		289.2	SURCHARGED	
3.000	14	99.239	-0.161	0.000	0.18		9.6	OK	
3.001	15	99.233	-0.058	0.000	0.19		19.1	OK	
3.002	16	99.227	-0.014	0.000	0.34		32.8	OK	
3.003	17	99.216	0.050	0.000	0.81		79.5	SURCHARGED	
1.010	18	99.186	0.091	0.000	1.29		332.0	SURCHARGED	
1.011	19	99.020	0.520	0.000	0.39		5.0	SURCHARGED	

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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)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.400	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)	0.900
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

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.004	4-8	0.523	8-12	0.908	12-16	0.084

Total Area Contributing (ha) = 1.520

Total Pipe Volume (m³) = 77.652

Network Design Table for Storm

« - 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)	Section Type	Auto Design
S1.000	43.970	0.250	175.9	0.165	5.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	16.801	0.090	186.7	0.060	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	19.318	0.060	322.0	0.050	0.00	0.0	0.600	o	375	Pipe/Conduit	
S2.002	39.532	0.125	316.3	0.060	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.62	100.500	0.165	0.0	0.0	0.0	1.18	83.6	22.3
S2.000	50.00	5.21	100.600	0.060	0.0	0.0	0.0	1.32	146.1	8.1
S2.001	50.00	5.53	100.510	0.110	0.0	0.0	0.0	1.00	110.9	14.9
S2.002	50.00	6.18	100.450	0.170	0.0	0.0	0.0	1.01	111.9	23.0

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.001	9.177	0.040	229.4	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	59.424	0.215	276.4	0.150	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	40.129	0.105	382.2	0.105	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	42.045	0.140	300.3	0.100	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.001	37.104	0.110	337.3	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	12.242	0.030	408.1	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S5.000	61.587	0.135	456.2	0.080	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	17.641	0.040	441.0	0.080	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	15.269	0.040	381.7	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.006	55.483	0.160	346.8	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.007	9.442	0.030	314.7	0.060	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	44.663	0.090	496.3	0.080	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	59.651	0.130	458.9	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	
S6.000	11.031	0.035	315.2	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.001	50.00	6.31	100.250	0.365	0.0	0.0	0.0	1.19	131.6	49.4
S3.000	50.00	6.05	100.500	0.150	0.0	0.0	0.0	0.94	66.5	20.3
S1.002	50.00	7.04	100.210	0.620	0.0	0.0	0.0	0.92	101.7	84.0
S4.000	50.00	5.78	100.430	0.100	0.0	0.0	0.0	0.90	63.8	13.5
S4.001	50.00	6.50	100.290	0.150	0.0	0.0	0.0	0.85	60.1	20.3
S1.003	50.00	7.24	100.030	0.800	0.0	0.0	0.0	1.00	159.1	108.3
S5.000	50.00	6.41	100.135	0.080	0.0	0.0	0.0	0.73	51.6	10.8
S1.004	50.00	7.55	100.000	0.960	0.0	0.0	0.0	0.96	152.9	130.0
S1.005	50.00	7.79	99.960	1.000	0.0	0.0	0.0	1.03	164.5	135.4
S1.006	50.00	8.64	99.920	1.100	0.0	0.0	0.0	1.09	172.7	149.0
S1.007	50.00	8.78	99.760	1.160	0.0	0.0	0.0	1.14	181.4	157.1
S1.008	50.00	9.60	99.730	1.240	0.0	0.0	0.0	0.91	144.1«	167.9
S1.009	50.00	10.66	99.640	1.280	0.0	0.0	0.0	0.94	149.9«	173.3
S6.000	50.00	5.21	99.870	0.050	0.0	0.0	0.0	0.88	62.2	6.8

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.001	20.572	0.065	316.5	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.002	5.909	0.020	295.5	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.003	33.278	0.110	302.5	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.004	12.624	0.040	315.6	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.005	70.555	0.090	783.9	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	22.825	0.000	0.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.001	50.00	5.60	99.835	0.100	0.0	0.0	0.0	0.88	62.1	13.5
S6.002	50.00	5.71	99.770	0.130	0.0	0.0	0.0	0.91	64.3	17.6
S6.003	50.00	6.32	99.750	0.180	0.0	0.0	0.0	0.90	63.5	24.4
S6.004	50.00	6.56	99.640	0.210	0.0	0.0	0.0	0.88	62.2	28.4
S6.005	50.00	8.69	99.600	0.240	0.0	0.0	0.0	0.55	39.1	32.5
S1.010	50.00	13.21	99.510	1.520	0.0	0.0	0.0	0.15	10.5«	205.8

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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	0.165	0.165	0.165
2.000	-	-	100	0.060	0.060	0.060
2.001	-	-	100	0.050	0.050	0.050
2.002	-	-	100	0.060	0.060	0.060
1.001	-	-	100	0.030	0.030	0.030
3.000	-	-	100	0.150	0.150	0.150
1.002	-	-	100	0.105	0.105	0.105
4.000	-	-	100	0.100	0.100	0.100
4.001	-	-	100	0.050	0.050	0.050
1.003	-	-	100	0.030	0.030	0.030
5.000	-	-	100	0.080	0.080	0.080
1.004	-	-	100	0.080	0.080	0.080
1.005	-	-	100	0.040	0.040	0.040
1.006	-	-	100	0.100	0.100	0.100
1.007	-	-	100	0.060	0.060	0.060
1.008	-	-	100	0.080	0.080	0.080
1.009	-	-	100	0.040	0.040	0.040
6.000	-	-	100	0.050	0.050	0.050
6.001	-	-	100	0.050	0.050	0.050
6.002	-	-	100	0.030	0.030	0.030
6.003	-	-	100	0.050	0.050	0.050
6.004	-	-	100	0.030	0.030	0.030
6.005	-	-	100	0.030	0.030	0.030
1.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.520	1.520	1.520

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.010	S	100.500	99.510	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

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Simulation Criteria for Storm

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)	19.900	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SS524, DS/PN: S1.010, Volume (m³): 15.9

Unit Reference	MD-SHE-0107-5500-1240-5500
Design Head (m)	1.240
Design Flow (l/s)	5.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	99.510
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	1.240	5.5
Flush-Flo™	0.363	5.5
Kick-Flo®	0.766	4.4
Mean Flow over Head Range	-	4.8

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

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	3.6	1.200	5.4	3.000	8.3	7.000	12.4
0.200	5.2	1.400	5.8	3.500	8.9	7.500	12.9
0.300	5.5	1.600	6.2	4.000	9.5	8.000	13.3
0.400	5.5	1.800	6.5	4.500	10.1	8.500	13.6
0.500	5.4	2.000	6.9	5.000	10.6	9.000	14.0
0.600	5.2	2.200	7.2	5.500	11.1	9.500	14.4
0.800	4.5	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.0		

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Storage Structures for Storm

Tank or Pond Manhole: SS524, DS/PN: S1.010

Invert Level (m) 99.510

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	935.0	1.240	1532.0

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S1.000	SS501	1.696	3.018	0.000	4.714
S2.000	SS502	1.861	1.707	0.000	3.567
S2.001	SS503	1.990	1.985	0.000	3.974
S2.002	SS504	2.076	4.217	0.000	6.293
S1.001	SS505	2.362	0.864	0.000	3.226
S3.000	SS506	1.583	4.110	0.000	5.694
S1.002	SS507	2.562	4.283	0.000	6.845
S4.000	SS508	1.549	2.887	0.000	4.437
S4.001	SS509	1.877	2.533	0.000	4.410
S1.003	SS510	2.820	1.732	0.000	4.552
S5.000	SS511	1.827	4.263	0.000	6.090
S1.004	SS512	2.720	2.591	0.000	5.311
S1.005	SS513	2.720	2.214	0.000	4.933
S1.006	SS514	2.763	8.609	0.000	11.372
S1.007	SS515	3.063	1.287	0.000	4.350
S1.008	SS516	3.249	6.889	0.000	10.138
S1.009	SS517	2.519	9.272	0.000	11.792
S6.000	SS518	1.674	0.695	0.000	2.369
S6.001	SS519	1.487	1.369	0.000	2.857
S6.002	SS520	1.278	0.333	0.000	1.611
S6.003	SS521	1.188	2.267	0.000	3.455
S6.004	SS522	1.086	0.808	0.000	1.893
S6.005	SS523	1.357	4.897	0.000	6.254
S1.010	SS524	1.775	1.566	1514.386	1517.727
Total		49.081	74.396	1514.386	1637.863

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1 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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS501	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S2.000	SS502	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S2.001	SS503	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S2.002	SS504	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.001	SS505	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S3.000	SS506	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.002	SS507	15 Winter	1	+0%	30/15 Summer			
S4.000	SS508	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S4.001	SS509	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.003	SS510	15 Winter	1	+0%	30/15 Summer			
S5.000	SS511	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.004	SS512	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S1.005	SS513	15 Winter	1	+0%	30/15 Summer			
S1.006	SS514	15 Winter	1	+0%	30/15 Summer			
S1.007	SS515	15 Winter	1	+0%	30/15 Summer			
S1.008	SS516	15 Winter	1	+0%	30/15 Summer			
S1.009	SS517	15 Winter	1	+0%	30/15 Summer			
S6.000	SS518	15 Winter	1	+0%	30/15 Summer			
S6.001	SS519	15 Winter	1	+0%	30/15 Summer			
S6.002	SS520	15 Winter	1	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS501	100.611	-0.189	0.000	0.28		22.2	OK	6
S2.000	SS502	100.666	-0.309	0.000	0.07		8.2	OK	6
S2.001	SS503	100.614	-0.271	0.000	0.15		13.8	OK	6
S2.002	SS504	100.564	-0.261	0.000	0.20		20.2	OK	6
S1.001	SS505	100.474	-0.151	0.000	0.44		42.3	OK	6
S3.000	SS506	100.619	-0.181	0.000	0.31		19.5	OK	6
S1.002	SS507	100.458	-0.127	0.000	0.76		70.2	OK	
S4.000	SS508	100.528	-0.202	0.000	0.22		13.3	OK	6
S4.001	SS509	100.410	-0.180	0.000	0.33		18.3	OK	2
S1.003	SS510	100.371	-0.109	0.000	0.84		84.3	OK	
S5.000	SS511	100.346	-0.089	0.000	0.19		9.3	OK	6
S1.004	SS512	100.339	-0.111	0.000	0.88		95.4	OK	3
S1.005	SS513	100.285	-0.125	0.000	0.87		98.0	OK	
S1.006	SS514	100.188	-0.182	0.000	0.65		102.2	OK	
S1.007	SS515	100.081	-0.129	0.000	0.85		103.3	OK	
S1.008	SS516	100.044	-0.136	0.000	0.81		105.2	OK	
S1.009	SS517	99.935	-0.155	0.000	0.75		104.3	OK	
S6.000	SS518	99.960	-0.210	0.000	0.14		6.8	OK	
S6.001	SS519	99.940	-0.195	0.000	0.23		12.4	OK	
S6.002	SS520	99.894	-0.176	0.000	0.35		15.5	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.003	SS521	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S6.004	SS522	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S6.005	SS523	15 Winter	1	+0%	30/15 Summer			
S1.010	SS524	960 Winter	1	+0%	30/60 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.003	SS521	99.876	-0.174	0.000	0.36		20.9	OK	2
S6.004	SS522	99.809	-0.131	0.000	0.47		23.2	OK	2
S6.005	SS523	99.784	-0.116	0.000	0.69		25.7	OK	
S1.010	SS524	99.736	-0.074	0.000	0.25		5.1	OK	

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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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS501	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S2.000	SS502	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S2.001	SS503	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S2.002	SS504	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.001	SS505	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S3.000	SS506	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.002	SS507	15 Winter	30	+0%	30/15 Summer			
S4.000	SS508	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S4.001	SS509	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.003	SS510	15 Winter	30	+0%	30/15 Summer			
S5.000	SS511	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.004	SS512	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S1.005	SS513	15 Winter	30	+0%	30/15 Summer			
S1.006	SS514	15 Winter	30	+0%	30/15 Summer			
S1.007	SS515	15 Winter	30	+0%	30/15 Summer			
S1.008	SS516	15 Winter	30	+0%	30/15 Summer			
S1.009	SS517	15 Winter	30	+0%	30/15 Summer			
S6.000	SS518	15 Winter	30	+0%	30/15 Summer			
S6.001	SS519	15 Winter	30	+0%	30/15 Summer			
S6.002	SS520	15 Winter	30	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS501	101.248	0.448	0.000	0.60		46.7	SURCHARGED	6
S2.000	SS502	101.240	0.265	0.000	0.15		17.9	SURCHARGED	6
S2.001	SS503	101.233	0.348	0.000	0.32		30.0	SURCHARGED	6
S2.002	SS504	101.223	0.398	0.000	0.39		39.3	SURCHARGED	6
S1.001	SS505	101.203	0.578	0.000	0.69		65.9	SURCHARGED	6
S3.000	SS506	101.228	0.428	0.000	0.65		41.0	SURCHARGED	6
S1.002	SS507	101.181	0.596	0.000	1.29		119.5	SURCHARGED	
S4.000	SS508	101.103	0.373	0.000	0.51		30.4	SURCHARGED	6
S4.001	SS509	101.076	0.486	0.000	0.56		31.1	SURCHARGED	2
S1.003	SS510	101.041	0.561	0.000	1.51		150.5	SURCHARGED	
S5.000	SS511	101.023	0.588	0.000	0.40		19.9	SURCHARGED	6
S1.004	SS512	100.997	0.547	0.000	1.67		180.5	SURCHARGED	3
S1.005	SS513	100.915	0.505	0.000	1.62		183.2	SURCHARGED	
S1.006	SS514	100.818	0.448	0.000	1.21		192.1	SURCHARGED	
S1.007	SS515	100.585	0.375	0.000	1.63		197.6	SURCHARGED	
S1.008	SS516	100.460	0.280	0.000	1.57		203.3	SURCHARGED	
S1.009	SS517	100.233	0.143	0.000	1.46		201.5	SURCHARGED	
S6.000	SS518	100.224	0.054	0.000	0.30		14.4	SURCHARGED	
S6.001	SS519	100.213	0.078	0.000	0.50		27.2	SURCHARGED	
S6.002	SS520	100.184	0.114	0.000	0.79		35.0	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.003	SS521	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S6.004	SS522	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S6.005	SS523	15 Winter	30	+0%	30/15 Summer			
S1.010	SS524	960 Winter	30	+0%	30/60 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.003	SS521	100.168	0.118	0.000	0.81		47.1	SURCHARGED	2
S6.004	SS522	100.092	0.152	0.000	1.10		54.4	SURCHARGED	2
S6.005	SS523	100.045	0.145	0.000	1.60		60.0	SURCHARGED	
S1.010	SS524	100.004	0.194	0.000	0.26		5.5	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 * 10m³/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 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.800 Cv (Winter) 0.840

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

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 (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS501	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S2.000	SS502	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S2.001	SS503	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S2.002	SS504	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.001	SS505	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S3.000	SS506	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.002	SS507	15 Winter	100	+40%	30/15 Summer			
S4.000	SS508	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S4.001	SS509	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.003	SS510	15 Winter	100	+40%	30/15 Summer			
S5.000	SS511	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.004	SS512	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S1.005	SS513	15 Summer	100	+40%	30/15 Summer			
S1.006	SS514	15 Winter	100	+40%	30/15 Summer			
S1.007	SS515	15 Winter	100	+40%	30/15 Summer			
S1.008	SS516	15 Winter	100	+40%	30/15 Summer			
S1.009	SS517	15 Winter	100	+40%	30/15 Summer			
S6.000	SS518	15 Winter	100	+40%	30/15 Summer			
S6.001	SS519	15 Winter	100	+40%	30/15 Summer			
S6.002	SS520	15 Winter	100	+40%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS501	102.008	1.208	7.810	0.70		54.8	FLOOD	6
S2.000	SS502	101.911	0.936	10.823	0.83		97.9	FLOOD	6
S2.001	SS503	101.910	1.025	9.669	1.02		94.3	FLOOD	6
S2.002	SS504	101.909	1.084	9.089	0.89		90.5	FLOOD	6
S1.001	SS505	101.913	1.288	13.004	1.05		99.7	FLOOD	6
S3.000	SS506	101.918	1.118	17.645	1.03		65.3	FLOOD	6
S1.002	SS507	101.990	1.405	0.000	1.75		162.2	FLOOD RISK	
S4.000	SS508	101.812	1.082	11.745	0.87		51.4	FLOOD	6
S4.001	SS509	101.950	1.360	0.643	0.97		53.6	FLOOD	2
S1.003	SS510	101.961	1.481	0.000	1.95		194.3	FLOOD RISK	
S5.000	SS511	101.759	1.324	9.277	1.00		48.9	FLOOD	6
S1.004	SS512	101.901	1.451	1.370	2.17		234.5	FLOOD	3
S1.005	SS513	101.848	1.438	0.000	2.10		237.1	FLOOD RISK	
S1.006	SS514	101.759	1.389	0.000	1.60		253.7	FLOOD RISK	
S1.007	SS515	101.389	1.179	0.000	2.26		275.0	SURCHARGED	
S1.008	SS516	101.134	0.954	0.000	2.32		300.1	SURCHARGED	
S1.009	SS517	100.632	0.542	0.000	2.20		303.7	SURCHARGED	
S6.000	SS518	100.971	0.801	0.000	0.55		26.7	SURCHARGED	
S6.001	SS519	100.950	0.815	0.000	0.94		51.3	FLOOD RISK	
S6.002	SS520	100.881	0.811	0.000	1.47		65.6	FLOOD RISK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.003	SS521	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S6.004	SS522	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S6.005	SS523	15 Summer	100	+40%	30/15 Summer			
S1.010	SS524	1440 Winter	100	+40%	30/60 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.003	SS521	100.801	0.751	1.293	1.35		78.6	FLOOD	2
S6.004	SS522	100.600	0.660	0.433	1.89		93.4	FLOOD	2
S6.005	SS523	100.484	0.584	0.000	2.61		97.8	SURCHARGED	
S1.010	SS524	100.434	0.624	0.000	0.26		5.5	SURCHARGED	

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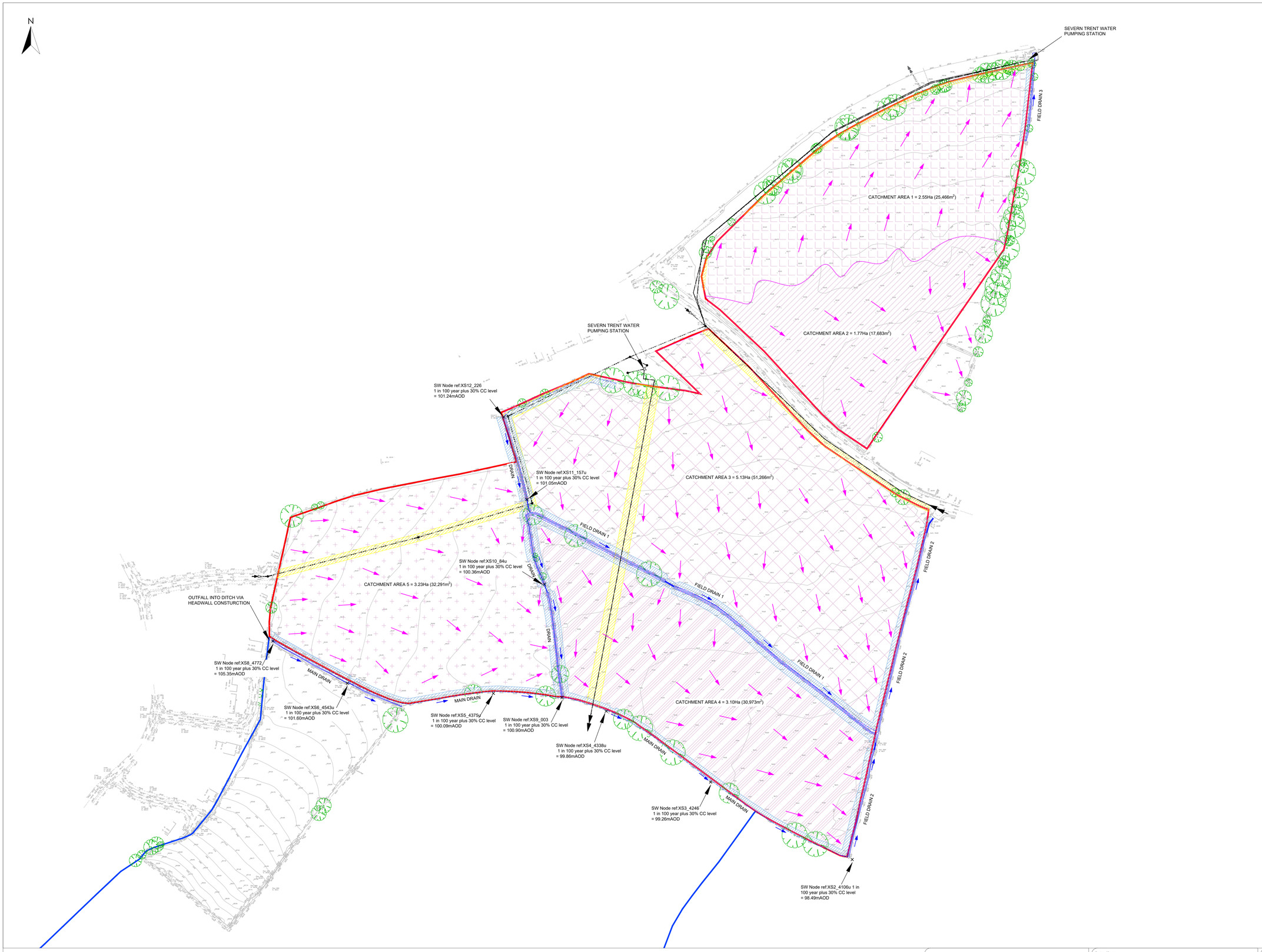
Appendix VI
Drainage Drawings



NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS ARE SHOWN IN mAOD UNLESS STATED OTHERWISE.

KEY

- SITE REDLINE BOUNDARY
- OWNERSHIP BOUNDARY
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC FOUL RISING MAIN
- EXISTING PUBLIC OVERFLOW SEWER
- DRAINAGE EASEMENT
- DITCH CHANNEL
- TOP BANK OF DITCH
- DIRECTION OF DITCH FLOW
- EXISTING CULVERT
- 4.5m WIDE DITCH EASEMENT FOR DITCH >2m WIDE AND 3.0m WIDE EASEMENT FOR CULVERT
- OVERLAND FLOW DIRECTION ARROW
- CATCHMENT AREA 1
- CATCHMENT AREA 2
- CATCHMENT AREA 3
- CATCHMENT AREA 4
- CATCHMENT AREA 5

SW Node ref:XS2_4106u 1 in 100 year plus 30% CC level = 98.49mAOD — PRE DEVELOPMENT MODELLED 1 IN 100 UPPER LIMIT CLIMATE CHANGE SURFACE WATER FLOOD LEVELS - extracted from JBA Consulting report reference 'CUX-JBAU-XX-XX-RP-A1-CO1-BurbageModellingReport'

PLANNING

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All dimensions to be checked on site. Drawing to be read in conjunction with any specifications, schedules and Consultants drawings and details.

Rev	Revision Details	By	Chk'd	Date

AVISON YOUNG
3 Brindleyplace, Birmingham, B1 2JB
08449 02 03 04 www.avisonyoung.co.uk

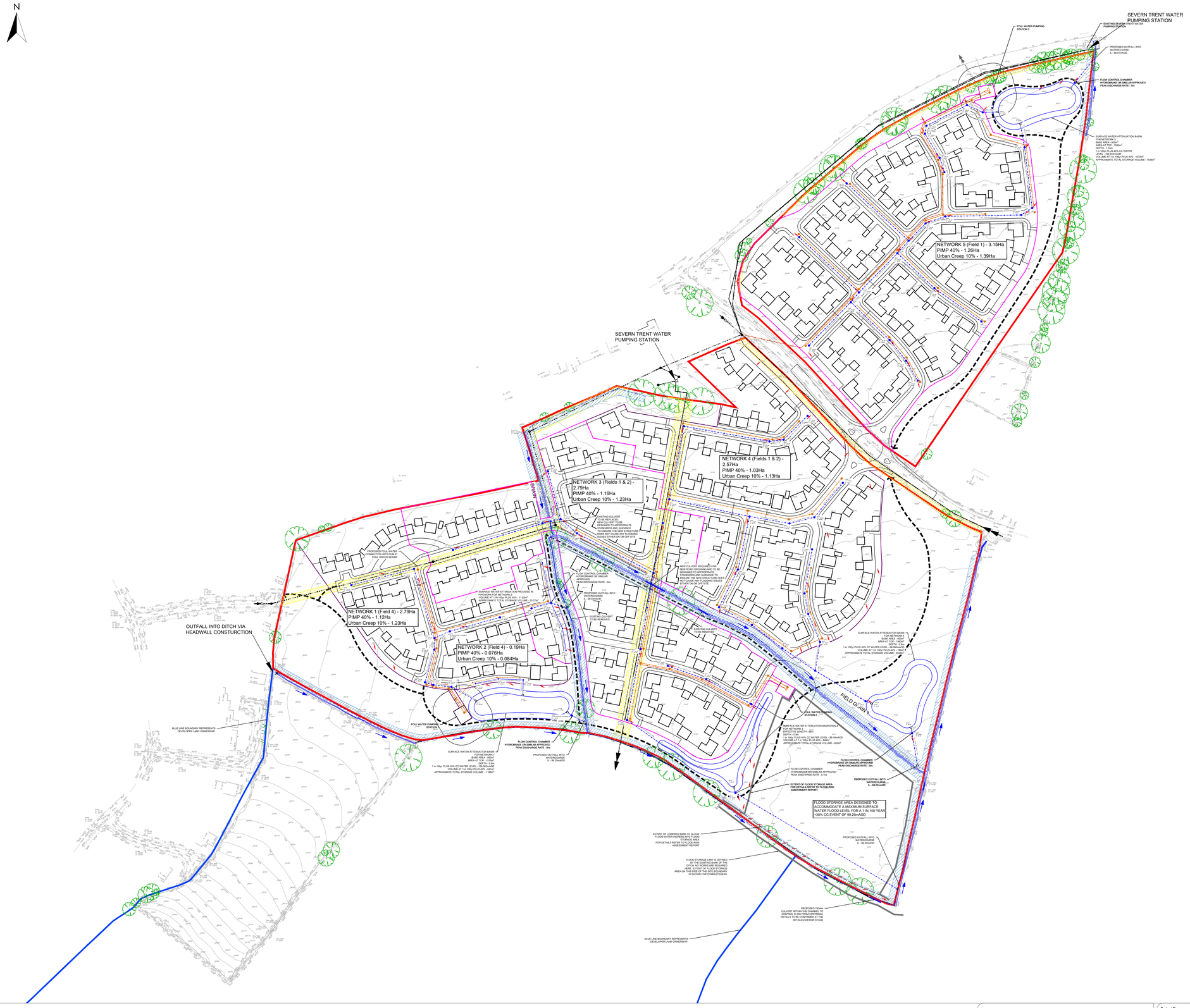
Project Name	Scale @ A0	Drawn	Checked	Date
Land South of Sapcote Road Burbage	1:1250	GH	DH	14.06.23

Client: Jelson Homes Ltd

Project No.: 01C300542

Drawing Title: Existing Catchment Area Plan

Drawing No.: 005 Rev.: - A0



NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS ARE SHOWN IN mAOD UNLESS STATED OTHERWISE.

KEY

- SITE REDLINE BOUNDARY - WHERE BLUE AND RED LINES COINCIDE, THE ONLY THE RED LINE BOUNDARY IS SHOWN FOR CLARITY
- OWNERSHIP BOUNDARY
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC FOUL RISING MAIN
- EXISTING PUBLIC OVERFLOW SEWER
- DRAINAGE EASEMENT
- DITCH CHANNEL
- TOP BANK OF DITCH
- DIRECTION OF DITCH FLOW
- EXISTING CULVERT
- 4.5m WIDE DITCH EASEMENT FOR DITCH >2m WIDE AND 3.0m WIDE EASEMENT FOR CULVERT
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER RISING MAIN
- EXCEEDANCE FLOW ROUTE
- DRAINAGE NETWORK CATCHMENT AREA BOUNDARY

PLANNING

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Rev	Revision Details	By	Chk'd	Date
A	Amendments made in accordance with LLFA requirements	GH	GC	22.06.23

AVISON YOUNG
3 Brindleyplace, Birmingham, B1 2JB
08449 02 03 04 www.avisonyoung.co.uk

Project Name	Scale @ A0	Drawn	Checked	Date
Land South of Sapcote Road Burbage	1:1250	GH	DH	14.06.23

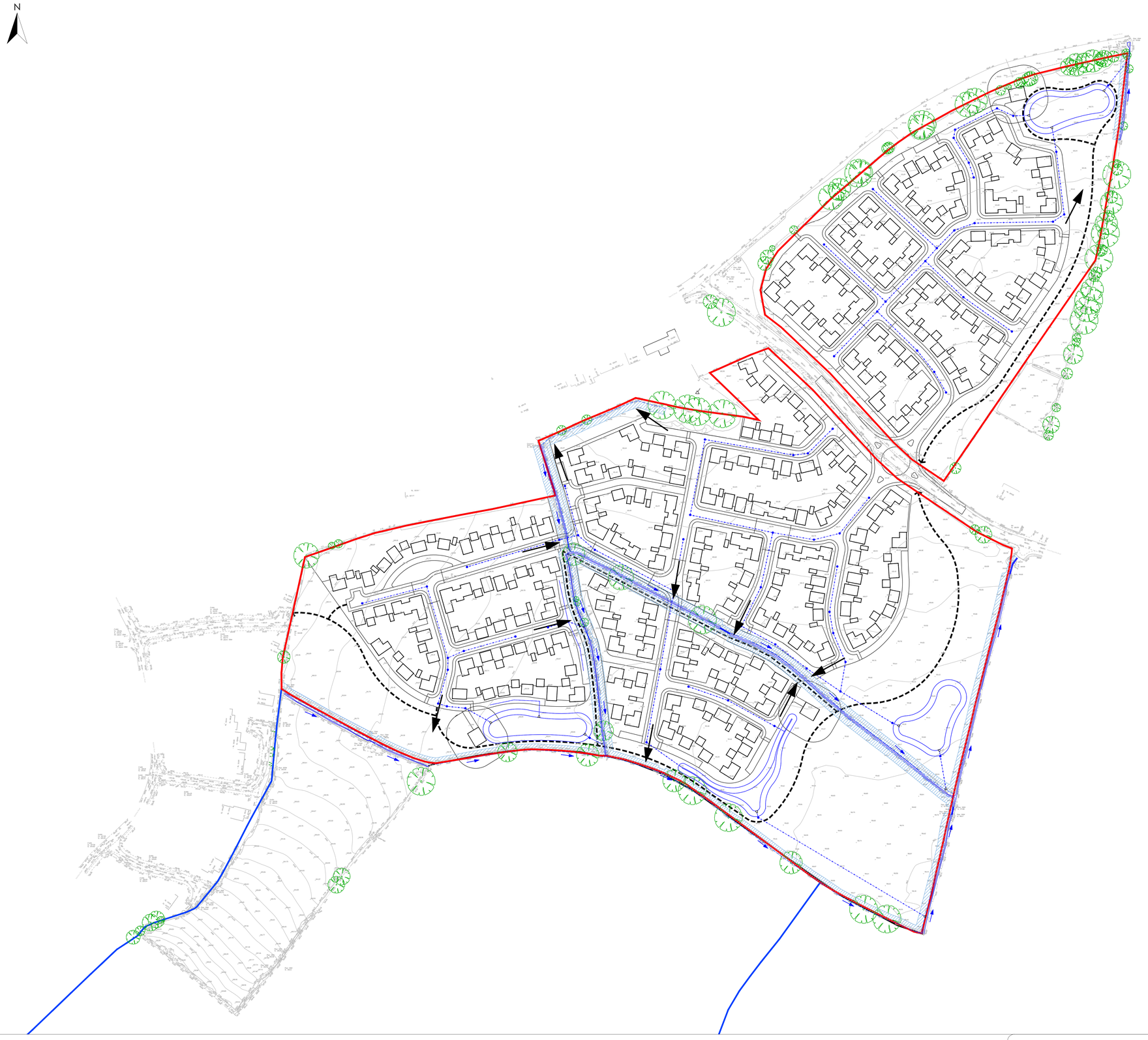
Client: Jelson Homes Ltd

Drawing Title: Outline Drainage Strategy Plan

Project No.: 01C300542

Drawing No.: 001 Rev.: A

A0



NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS ARE SHOWN IN mAOD UNLESS STATED OTHERWISE.

KEY

- SITE REDLINE BOUNDARY
- OWNERSHIP BOUNDARY
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC FOUL RISING MAIN
- EXISTING PUBLIC OVERFLOW SEWER
- DRAINAGE EASEMENT
- DITCH CHANNEL
- TOP BANK OF DITCH
- DIRECTION OF DITCH FLOW
- EXISTING CULVERT
- 4.5m WIDE DITCH EASEMENT FOR DITCH >2m WIDE AND 3.0m WIDE EASEMENT FOR CULVERT
- MAINTENANCE ACCESS POINT

PLANNING

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All dimensions to be checked on site. Drawing to be read in conjunction with any specifications, schedules and Consultants drawings and details.

Rev	Revision Details	By	Chk'd	Date

AVISON YOUNG
3 Brindleyplace, Birmingham, B1 2JB
08449 02 03 04 www.avisonyoung.co.uk

Project Name	Scale @ A0	Drawn	Checked	Date
Land South of Sapcote Road Burbage	1:1250	GH	DH	14.06.23

Client: Jelson Homes Ltd

Drawing Title: Maintenance Access Plan

Project No.: 01C300542

Drawing No.: 002

Rev.: -

A0

Appendix VII

Severn Trent Water Pre-Application Response

Hasan, Kazi (Avison Young - UK)

From: Baker, Keith <Keith.Baker@severntrent.co.uk>
Sent: 03 March 2021 08:44
To: Hasan, Kazi (Avison Young - UK)
Subject: DE: 8444156 - Aston Flamville Road, Burbage, Hinckley

External Sender

ST Classification: OFFICIAL PERSONAL

Hi Kazi,

I have received the SCA modelling report and can confirm that there were Very Low risks on all aspects for flooding impact, pollution impact and operational impacts. No network capacity improvements are needed to accommodate this development based on the following:

Approx 35% of flows to the north to MH 1402 or MH 1401 and approx. 65% of flows south to MH 0303.

Kind regards,

Keith Baker
Senior Evaluation Technician
Asset Protection East (Waste Water)
Asset Strategy and Planning
Chief Engineer

Mob: 07889 631417

Severn Trent Plc (registered number 2366619) and Severn Trent Water Limited (registered number 2366686) (together the "Companies") are both limited companies registered in England & Wales with their registered office at Severn Trent Centre, 2 St John's Street, Coventry, CV1 2LZ This email (which includes any files attached to it) is not contractually binding on its own, is intended solely for the named recipient and may contain CONFIDENTIAL, legally privileged or trade secret information protected by law. If you have received this message in error please delete it and notify us immediately by telephoning +44 2477715000. If you are not the intended recipient you must not use, disclose, distribute, reproduce, retransmit, retain or rely on any information contained in this email. Please note the Companies reserve the right to monitor email communicationsin accordance with applicable law and regulations. To the extent permitted by law, neither the Companies or any of their subsidiaries, nor any employee, director or officer thereof, accepts any liability whatsoever in relation to this email including liability arising from any external breach of security or confidentiality or for virus infection or for statements made by the sender as these are not necessarily made on behalf of the Companies. Reduce waste! Please consider the environment before printing this email

Contact Details

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