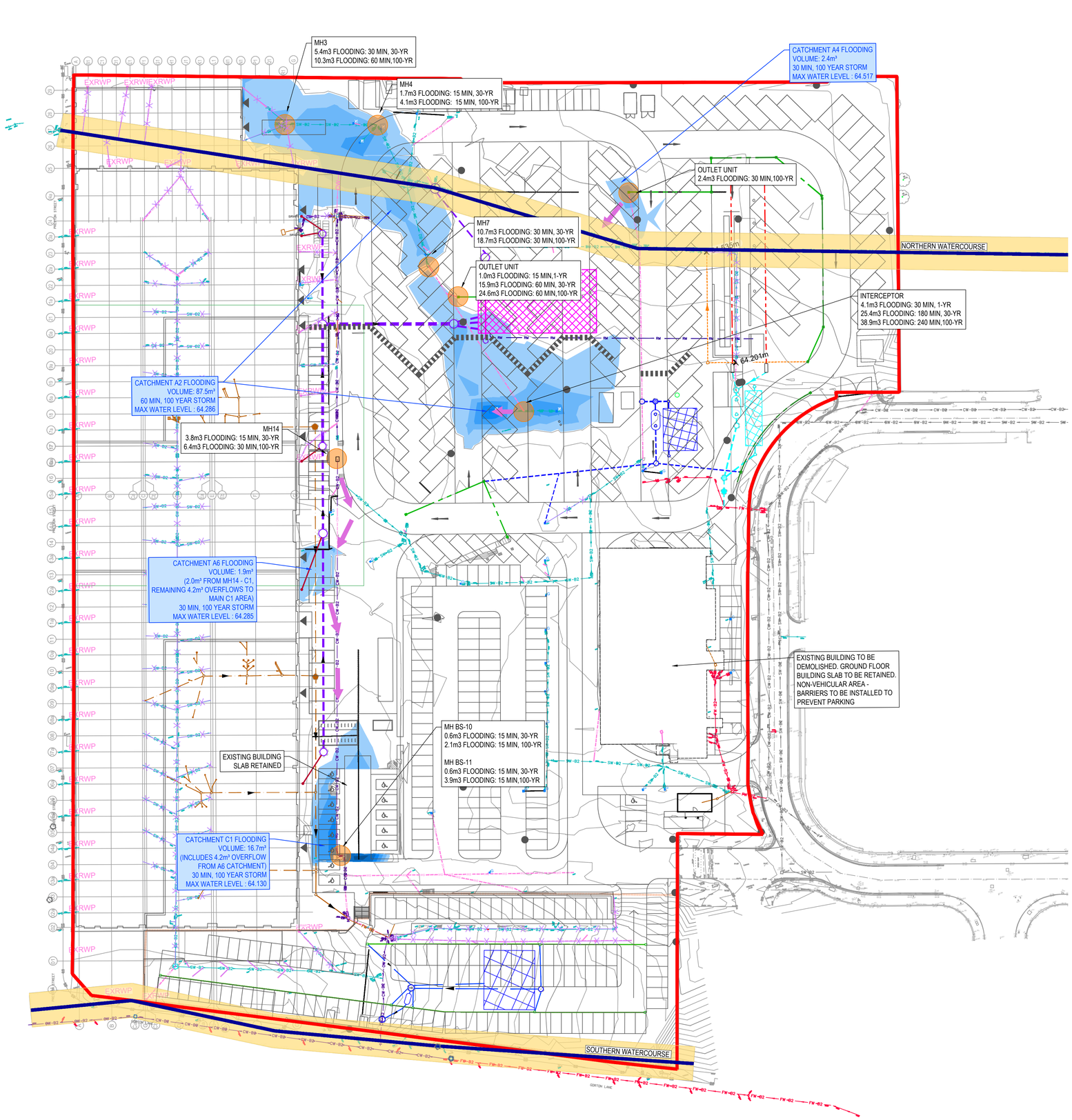


TABLE 1:FLOODING DEPTHS: 100-YEAR STORM EVENT

SURFACE LEVEL DATA			
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
1	0.000	0.050	
2	0.050	0.100	
3	0.100	0.150	
4	0.150	0.200	
5	0.200	0.250	
6	0.250	0.300	

KEY:

- SITE BOUNDARY BASED ON HRD-FRA-00-XX-DR-A-90-0200

EXISTING SERVICES BASED ON GPR SURVEY S17480-U DEC 2018

- UNKNOWN SERVICE
- FW=B2 — FOUL WATER PIPE
- SW=B2 — SURFACE WATER PIPE
- CW=B2 — COMBINED WATER DRAIN

UNITED UTILITIES RECORDS UUPS-ORD-76950 ALL UU ASSETS ARE SHOWN INDICATIVELY

- SW=B2 — EXISTING UU SURFACE WATER SEWER
- CW=B2 — EXISTING UU COMBINED WATER SEWER
- EXISTING WATERCOURSE
- 8M EASEMENT BASED ON SEWER FOR ADOPTION 6TH EDITION
- EXISTING LINEAR DRAINAGE CHANNEL
  CHANNEL SIZE, CONDITION OUTLET TBC
- EXISTING GULLY
- SW — ASSUMED SURFACE WATER DRAIN ROUTE
- CW — ASSUMED COMBINED DRAIN ROUTE
- POINT OF FLOODING - VOLUMES SHOWN FOR CRITICAL STORM DURATIONS.
  FOR FLOODING DEPTHS REFER TO TABLE 1
- OVERLAND FLOW ROUTE

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN. ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
3. DO NOT SCALE THIS DRAWING. ALL DETAILS AND DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
4. WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.

DRAWING BASED ON:
TOPOGRAPHICAL SURVEY BY SEP S15724-T
GPR SURVEY BY SEP S17480-U DEC 2018 JUNE 2018
CCTV SURVEY BY SEP DRAINAGE SURVEYS LTD DEC 2018 AND AUG 2020
UU RECORDS UUPS-ORD-76950
PROPOSED SITE PLAN HRD-FRA-00-XX-SK-A-90-9006-C02

SAPOFLOW SIPHON SYSTEM 21.02.23
HRD-SAP-01-RL-DR-X-0001C02
HRD-SAP-01-RL-DR-X-0002 C02

EXISTING DRAINAGE HAS BEEN MODELLED WITHOUT ALLOWANCE FOR SURCHARGED OUTFALLS TO WATERCOURSE

FLOODING EXTENTS SUBJECT TO FURTHER CCTV SURVEY

Rev:	Description:	Date:	By:	Chkd:
P02	FLOODING LEVELS UPDATED	07.07.23	ATL	MW
P01	ISSUED FOR INFORMATION	16.06.23	JS	MW

curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 236 2394
manchester@curtins.com
www.curtins.com
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Status: PRELIMINARY

Project: HAMMERSTONE ROAD

Drg Title: POST DEVELOPMENT OVERFLOW PLAN

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1	16.06.23	JS	JS	MW
	Scale: 1:500				

Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:

HRD - CUR - XX - 00 - DR - C - 92-624 -P01

\\mab02\Projects\068001 - 069000\068065 - Hammerstone Road Depot\2-IMS & Production\4-BIM Models & Drawings_Civil-CCAD\new planning application\

Our Locations

Birmingham
2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol
Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cardiff
3 Cwrt-y-Parc
Earlswood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas
Varley House
29-31 Duke Street
Douglas
Isle of Man
IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Dublin
39 Fitzwilliam Square
Dublin 2
Ireland
T. 00353 1 507 9447
dublin@curtins.com

Edinburgh
1a Belford Road
Edinburgh
EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Glasgow
Queens House
29 St Vincent Place
Glasgow
G1 2DT
T. 0141 319 8777
glasgow@curtins.com

Kendal
28 Lowther Street
Kendal
Cumbria
LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds
Rose Wharf
Ground Floor
Leeds
L29 8EE
T. 0113 274 8509
leeds@curtins.com

Liverpool
Curtin House
Columbus Quay
Riverside Drive
Liverpool
L3 4DB
T. 0151 726 2000
liverpool@curtins.com

London
40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester
Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham
56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com

Registered in England and Wales number: 2054159
Registered office: Curtin House, Columbus Quay, Riverside Drive, Liverpool L3 4DB

Appendix G

Proposed Surface Water Model Building

Proposed Surface Water Model Washdown Area

Proposed Surface Water Model Lower Ground

Proposed Surface Water Model Area previous Cocacola building and additional impermeable area

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for siphon and harvesting

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	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.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for siphon and harvesting

- 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)	Section Type	Auto Design
1.000	45.000#	0.000	0.0	0.247	5.00	0.0	0.600	\/	-4	Pipe/Conduit	
1.001	0.501	1.670	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
1.002	5.390	0.054	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	51.315	0.128	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	15.000#	0.005	3000.0	0.245	5.00	0.0	0.600	\/	-4	Pipe/Conduit	
2.001	0.500#	1.667	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
2.002	5.823	0.058	100.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	29.243	0.073	400.0	0.000	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	44.73	9.34	65.700	0.247	0.0	0.0	0.0	0.17	25.9«	39.9
1.001	44.73	9.34	65.680	0.247	0.0	0.0	0.0	22.35	702.0	39.9
1.002	44.56	9.41	63.205	0.247	0.0	0.0	0.0	1.31	52.0	39.9
1.003	42.61	10.26	62.926	0.247	0.0	0.0	0.0	1.01	160.7	39.9
2.000	50.00	5.78	65.600	0.245	0.0	0.0	0.0	0.32	48.2	44.2
2.001	50.00	5.78	65.580	0.245	0.0	0.0	0.0	22.35	702.1	44.2
2.002	50.00	5.85	63.488	0.245	0.0	0.0	0.0	1.30	51.9	44.2
1.004	41.59	10.74	62.798	0.492	0.0	0.0	0.0	1.01	160.7	73.9

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Network Design Table for siphon and harvesting

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
3.000	35.000#	0.032	1093.8	0.235	5.00	0.0	0.600	\/	-4	Pipe/Conduit	
3.001	0.500#	1.667	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
3.002	6.390#	0.064	99.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	28.825	0.058	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
4.000	30.000#	0.007	4285.7	0.235	5.00	0.0	0.600	\/	-4	Pipe/Conduit	
4.001	0.500#	1.667	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
4.002	5.877	0.059	99.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	20.000#	0.007	2857.1	0.116	5.00	0.0	0.600	\/	-4	Pipe/Conduit	
5.001	0.500#	1.667	0.3	0.000	0.00	0.0	0.600	o	160	Pipe/Conduit	
5.002	5.761	0.058	99.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	21.481	0.054	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	31.179	0.052	600.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.007	7.723	0.026	297.0	0.000	0.00	0.0	0.600	ooo	-1	Pipe/Conduit	
1.008	17.634	0.059	298.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	18.442	0.369	50.0	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)
3.000	50.00	6.08	65.500	0.235	0.0	0.0	0.0	0.54	80.9	42.4
3.001	50.00	6.08	65.468	0.235	0.0	0.0	0.0	22.35	702.1	42.4
3.002	50.00	6.16	63.671	0.235	0.0	0.0	0.0	1.31	52.0	42.4
1.005	40.69	11.18	62.575	0.727	0.0	0.0	0.0	1.08	306.0	106.9
4.000	50.00	6.87	65.400	0.235	0.0	0.0	0.0	0.27	40.1«	42.5
4.001	50.00	6.87	65.268	0.235	0.0	0.0	0.0	22.35	702.1	42.5
4.002	50.00	6.95	63.371	0.235	0.0	0.0	0.0	1.31	52.1	42.5
5.000	50.00	6.01	65.700	0.116	0.0	0.0	0.0	0.33	49.5	20.9
5.001	50.00	6.01	65.680	0.116	0.0	0.0	0.0	19.36	389.2	20.9
5.002	50.00	6.08	63.440	0.116	0.0	0.0	0.0	1.31	52.2	20.9
4.003	50.00	7.30	62.898	0.351	0.0	0.0	0.0	1.01	160.7	63.4
1.006	39.82	11.64	62.367	1.079	0.0	0.0	0.0	1.14	501.5	155.1
1.007	39.60	11.76	62.315	1.079	0.0	0.0	0.0	1.09	410.9	155.1
1.008	39.01	12.08	60.980	1.079	0.0	0.0	0.0	0.90	63.9«	155.1
1.009	38.77	12.22	60.921	1.079	0.0	0.0	0.0	2.23	157.5	155.1

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Area Summary for siphon and harvesting

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.247	0.247	0.247
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.245	0.245	0.245
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.235	0.235	0.235
3.001	-	-	100	0.000	0.000	0.000
3.002	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.235	0.235	0.235
4.001	-	-	100	0.000	0.000	0.000
4.002	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.116	0.116	0.116
5.001	-	-	100	0.000	0.000	0.000
5.002	-	-	100	0.000	0.000	0.000
4.003	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.079	1.079	1.079

Surcharged Outfall Details for siphon and harvesting

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	SRH	64.301	60.552	59.300	0	0

Datum (m) 60.050 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	1.000	300	1.000	540	1.000	780	1.000	1020	1.000	1260	1.000
120	1.000	360	1.000	600	1.000	840	1.000	1080	1.000	1320	1.000
180	1.000	420	1.000	660	1.000	900	1.000	1140	1.000	1380	1.000
240	1.000	480	1.000	720	1.000	960	1.000	1200	1.000	1440	1.000

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Simulation Criteria for siphon and harvesting

Volumetric Runoff Coeff	1.000	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	6	Number of Time/Area Diagrams	0
Number of Offline Controls	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for siphon and harvesting

Siphon Manhole: SRHdp, DS/PN: 1.001, Volume (m³): 6.8

Invert Level (m) 65.680 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 2.001, Volume (m³): 2.3

Invert Level (m) 65.580 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 3.001, Volume (m³): 5.3

Invert Level (m) 65.468 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 4.001, Volume (m³): 4.5

Invert Level (m) 65.268 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 5.001, Volume (m³): 3.0

Invert Level (m) 65.680 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	77.7300	0.200	77.7300
0.100	77.7300	0.260	77.7300

Hydro-Brake® Optimum Manhole: SRH6, DS/PN: 1.009, Volume (m³): 7.2

Unit Reference MD-SHE-0175-1810-2000-1810
Design Head (m) 2.000

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Hydro-Brake® Optimum Manhole: SRH6, DS/PN: 1.009, Volume (m³): 7.2

Design Flow (l/s)	18.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	175
Invert Level (m)	60.921
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	18.1
Flush-Flo™	0.580	18.0
Kick-Flo®	1.220	14.3
Mean Flow over Head Range	-	15.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.2	1.200	14.6	3.000	21.9	7.000	33.0
0.200	15.1	1.400	15.3	3.500	23.6	7.500	34.1
0.300	16.7	1.600	16.3	4.000	25.2	8.000	35.2
0.400	17.5	1.800	17.2	4.500	26.6	8.500	36.2
0.500	17.9	2.000	18.1	5.000	28.0	9.000	37.2
0.600	18.0	2.200	18.9	5.500	29.3	9.500	38.2
0.800	17.6	2.400	19.7	6.000	30.6		
1.000	16.7	2.600	20.5	6.500	31.8		

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Offline Controls for siphon and harvesting

Depth/Flow Relationship Manhole: SRHdp, DS/PN: 1.001, Loop to PN: 1.002

Invert Level (m) 65.680

Depth (m)	Flow (l/s)
0.020	0.5000

Depth/Flow Relationship Manhole: SRHdp, DS/PN: 2.001, Loop to PN: 2.002

Invert Level (m) 65.580

Depth (m)	Flow (l/s)
0.020	0.5000

Depth/Flow Relationship Manhole: SRHdp, DS/PN: 3.001, Loop to PN: 3.002

Invert Level (m) 65.468

Depth (m)	Flow (l/s)
0.020	0.5000

Depth/Flow Relationship Manhole: SRHdp, DS/PN: 4.001, Loop to PN: 4.002

Invert Level (m) 65.580

Depth (m)	Flow (l/s)
0.020	0.5000

Depth/Flow Relationship Manhole: SRHdp, DS/PN: 5.001, Loop to PN: 5.002

Invert Level (m) 65.680

Depth (m)	Flow (l/s)
0.500	0.5000

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Storage Structures for siphon and harvesting

Cellular Storage Manhole: SRHtank, DS/PN: 1.008

Invert Level (m) 60.980 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	420.0	0.0	1.601	0.0	0.0
1.600	420.0	0.0			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for siphon and harvesting

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	6	Number of Time/Area Diagrams	0
Number of Offline Controls	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.000	SRHgutter	15 Summer	1	+0%			
1.001	SRHdp	60 Summer	1	+0%			1/15 Summer
1.002	SRHsiphon gf	15 Summer	1	+0%	1/15 Summer		
1.003	SRH1	15 Summer	1	+0%	100/15 Summer		
2.000	SRHgutter	15 Summer	1	+0%	100/15 Summer		
2.001	SRHdp	360 Winter	1	+0%	100/15 Summer		1/15 Summer
2.002	SRHsiphon gf	15 Summer	1	+0%	1/15 Summer		
1.004	SRH2	15 Summer	1	+0%	30/15 Summer		
3.000	SRHgutter	15 Summer	1	+0%	100/15 Summer		
3.001	SRHdp	60 Winter	1	+0%			1/15 Summer
3.002	SRHsiphon gf	15 Summer	1	+0%	30/15 Summer		
1.005	SRH3	15 Summer	1	+0%	100/15 Summer		
4.000	SRHgutter	15 Summer	1	+0%	100/15 Summer		
4.001	SRHdp	960 Winter	1	+0%			
4.002	SRHsiphon gf	15 Summer	1	+0%	30/15 Summer		
5.000	SRHgutter	15 Summer	1	+0%			
5.001	SRHdp	120 Summer	1	+0%			1/15 Summer
5.002	SRHsiphon gf	15 Summer	1	+0%	30/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for siphon and harvesting

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SRHgutter		65.793	-0.167	0.000	0.46		37.1	FLOOD RISK*
1.001	SRHdp	72	65.705	-0.175	0.000	0.18	0.5	25.9	FLOOD RISK*
1.002	SRHsiphon gf		63.439	0.009	0.000	1.14		37.4	SURCHARGED*
1.003	SRH1		63.095	-0.282	0.000	0.24		35.9	OK
2.000	SRHgutter		65.718	-0.142	0.000	0.59		36.8	FLOOD RISK*
2.001	SRHdp	72	65.605	-0.175	0.000	0.04	0.5	5.5	OK*
2.002	SRHsiphon gf		63.717	0.004	0.000	1.08		36.7	SURCHARGED*
1.004	SRH2		63.023	-0.225	0.000	0.49		68.2	OK
3.000	SRHgutter		65.616	-0.144	0.000	0.50		35.5	OK
3.001	SRHdp	72	65.493	-0.175	0.000	0.12	0.5	17.7	OK*
3.002	SRHsiphon gf		63.858	-0.038	0.000	0.99		35.5	OK*
1.005	SRH3		62.839	-0.335	0.000	0.40		98.4	OK
4.000	SRHgutter		65.516	-0.144	0.000	0.55		35.8	OK
4.001	SRHdp	0	65.293	-0.175	0.000	0.02	0.0	2.9	OK*
4.002	SRHsiphon gf		63.596	0.000	0.000	1.03		35.1	OK*
5.000	SRHgutter		65.771	-0.189	0.000	0.33		17.6	FLOOD RISK*
5.001	SRHdp	72	65.705	-0.135	0.000	0.09	0.0	8.6	FLOOD RISK*
5.002	SRHsiphon gf		63.557	-0.108	0.000	0.52		17.6	OK*

PN	US/MH Name	Level Exceeded
1.000	SRHgutter	
1.001	SRHdp	
1.002	SRHsiphon gf	
1.003	SRH1	
2.000	SRHgutter	
2.001	SRHdp	
2.002	SRHsiphon gf	
1.004	SRH2	
3.000	SRHgutter	
3.001	SRHdp	
3.002	SRHsiphon gf	
1.005	SRH3	
4.000	SRHgutter	
4.001	SRHdp	
4.002	SRHsiphon gf	
5.000	SRHgutter	
5.001	SRHdp	
5.002	SRHsiphon gf	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for siphon and harvesting

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.003	SRH5	15 Summer	1	+0%	100/15 Summer				63.097
1.006	SRH4	15 Summer	1	+0%	100/15 Summer				62.685
1.007	SRH6a	15 Summer	1	+0%	100/15 Summer				62.520
1.008	SRHtank	360 Summer	1	+0%	1/240 Summer				61.289
1.009	SRH6	360 Summer	1	+0%	1/120 Summer				61.288

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.003	SRH5	-0.251	0.000	0.40		53.0	OK	
1.006	SRH4	-0.432	0.000	0.37		144.8	OK	
1.007	SRH6a	-0.195	0.000	0.52		144.9	OK	
1.008	SRHtank	0.009	0.000	0.30		16.4	SURCHARGED	
1.009	SRH6	0.067	0.000	0.11		15.2	SURCHARGED	

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

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	6	Number of Time/Area Diagrams	0
Number of Offline Controls	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.000	SRHgutter	15 Summer	30	+0%			
1.001	SRHdp	360 Summer	30	+0%			1/15 Summer
1.002	SRHsiphon gf	15 Summer	30	+0%	1/15 Summer		
1.003	SRH1	15 Summer	30	+0%	100/15 Summer		
2.000	SRHgutter	15 Summer	30	+0%	100/15 Summer		
2.001	SRHdp	720 Winter	30	+0%	100/15 Summer		1/15 Summer
2.002	SRHsiphon gf	15 Summer	30	+0%	1/15 Summer		
1.004	SRH2	15 Summer	30	+0%	30/15 Summer		
3.000	SRHgutter	15 Summer	30	+0%	100/15 Summer		
3.001	SRHdp	30 Winter	30	+0%			1/15 Summer
3.002	SRHsiphon gf	15 Winter	30	+0%	30/15 Summer		
1.005	SRH3	15 Summer	30	+0%	100/15 Summer		
4.000	SRHgutter	15 Summer	30	+0%	100/15 Summer		
4.001	SRHdp	480 Winter	30	+0%			
4.002	SRHsiphon gf	15 Winter	30	+0%	30/15 Summer		
5.000	SRHgutter	15 Summer	30	+0%			
5.001	SRHdp	1440 Summer	30	+0%			1/15 Summer
5.002	SRHsiphon gf	15 Summer	30	+0%	30/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SRHgutter		65.848	-0.112	0.000	1.15		92.0	FLOOD RISK*
1.001	SRHdp	72	65.705	-0.175	0.000	0.14	0.5	20.1	FLOOD RISK*
1.002	SRHsiphon gf		63.805	0.375	0.000	2.80		91.5	SURCHARGED*
1.003	SRH1		63.353	-0.023	0.000	0.59		86.8	OK
2.000	SRHgutter		65.829	-0.031	0.000	1.46		90.4	FLOOD RISK*
2.001	SRHdp	72	65.605	-0.175	0.000	0.05	0.5	7.4	OK*
2.002	SRHsiphon gf		64.053	0.340	0.000	2.66		90.3	FLOOD RISK*
1.004	SRH2		63.268	0.020	0.000	1.22		167.7	SURCHARGED
3.000	SRHgutter		65.723	-0.037	0.000	1.23		87.4	FLOOD RISK*
3.001	SRHdp	72	65.493	-0.175	0.000	0.45	0.5	64.6	OK*
3.002	SRHsiphon gf		64.001	0.105	0.000	2.27		81.1	SURCHARGED*
1.005	SRH3		63.048	-0.127	0.000	0.96		237.3	OK
4.000	SRHgutter		65.624	-0.036	0.000	1.34		87.8	OK
4.001	SRHdp	0	65.293	-0.175	0.000	0.07	0.0	10.2	OK*
4.002	SRHsiphon gf		63.801	0.205	0.000	2.37		81.1	SURCHARGED*
5.000	SRHgutter		65.833	-0.127	0.000	0.80		43.1	FLOOD RISK*
5.001	SRHdp	72	65.705	-0.135	0.000	0.04	0.0	3.6	FLOOD RISK*
5.002	SRHsiphon gf		63.690	0.025	0.000	1.27		43.1	SURCHARGED*

PN	US/MH Name	Level Exceeded
1.000	SRHgutter	
1.001	SRHdp	
1.002	SRHsiphon gf	
1.003	SRH1	
2.000	SRHgutter	
2.001	SRHdp	
2.002	SRHsiphon gf	
1.004	SRH2	
3.000	SRHgutter	
3.001	SRHdp	
3.002	SRHsiphon gf	
1.005	SRH3	
4.000	SRHgutter	
4.001	SRHdp	
4.002	SRHsiphon gf	
5.000	SRHgutter	
5.001	SRHdp	
5.002	SRHsiphon gf	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.003	SRH5	15 Summer	30	+0%	100/15 Summer				63.259
1.006	SRH4	15 Summer	30	+0%	100/15 Summer				62.926
1.007	SRH6a	30 Summer	30	+0%	100/15 Summer				62.715
1.008	SRHtank	360 Summer	30	+0%	1/240 Summer				61.737
1.009	SRH6	240 Summer	30	+0%	1/120 Summer				61.982

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.003	SRH5	-0.089	0.000	0.99		130.2	OK	
1.006	SRH4	-0.192	0.000	0.89		348.7	OK	
1.007	SRH6a	0.000	0.000	1.17		325.7	OK	
1.008	SRHtank	0.457	0.000	0.46		25.1	SURCHARGED	
1.009	SRH6	0.761	0.000	0.13		17.9	SURCHARGED	

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

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	6	Number of Time/Area Diagrams	0
Number of Offline Controls	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SRHgutter	15 Summer	100	+45%				
1.001	SRHdp	15 Summer	100	+45%			1/15 Summer	72
1.002	SRHsiphon gf	15 Winter	100	+45%	1/15 Summer			
1.003	SRH1	15 Summer	100	+45%	100/15 Summer			
2.000	SRHgutter	15 Summer	100	+45%	100/15 Summer			
2.001	SRHdp	15 Summer	100	+45%	100/15 Summer		1/15 Summer	72
2.002	SRHsiphon gf	15 Winter	100	+45%	1/15 Summer			
1.004	SRH2	15 Summer	100	+45%	30/15 Summer			
3.000	SRHgutter	15 Summer	100	+45%	100/15 Summer			
3.001	SRHdp	15 Summer	100	+45%			1/15 Summer	72
3.002	SRHsiphon gf	15 Winter	100	+45%	30/15 Summer			
1.005	SRH3	15 Summer	100	+45%	100/15 Summer			
4.000	SRHgutter	15 Summer	100	+45%	100/15 Summer			
4.001	SRHdp	15 Summer	100	+45%				0
4.002	SRHsiphon gf	15 Winter	100	+45%	30/15 Summer			
5.000	SRHgutter	15 Summer	100	+45%				
5.001	SRHdp	15 Summer	100	+45%			1/15 Summer	72
5.002	SRHsiphon gf	15 Summer	100	+45%	30/15 Summer			

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

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	SRHgutter	65.928	-0.032	0.000	2.09		168.2	FLOOD RISK*	
1.001	SRHdp	65.784	-0.096	0.000	1.08	0.5	155.5	FLOOD RISK*	
1.002	SRHsiphon gf	65.000	1.570	0.000	4.77		155.9	FLOOD RISK*	
1.003	SRH1	63.929	0.553	0.000	1.04		152.8	FLOOD RISK	
2.000	SRHgutter	65.948	0.088	0.000	2.74		169.7	FLOOD RISK*	
2.001	SRHdp	65.788	0.008	0.000	1.08	0.5	155.5	FLOOD RISK*	
2.002	SRHsiphon gf	64.113	0.400	0.000	4.55		154.5	FLOOD RISK*	
1.004	SRH2	63.780	0.532	0.000	2.21		303.8	SURCHARGED	
3.000	SRHgutter	65.849	0.089	0.000	2.31		163.4	FLOOD RISK*	
3.001	SRHdp	65.524	-0.144	0.000	1.08	0.5	155.5	OK*	
3.002	SRHsiphon gf	64.001	0.105	0.000	4.27		152.4	SURCHARGED*	
1.005	SRH3	63.420	0.246	0.000	1.82		451.5	SURCHARGED	
4.000	SRHgutter	65.756	0.096	0.000	2.50		163.8	FLOOD RISK*	
4.001	SRHdp	65.446	-0.022	0.000	1.08	0.0	155.5	OK*	
4.002	SRHsiphon gf	63.801	0.205	0.000	4.44		152.1	SURCHARGED*	
5.000	SRHgutter	65.911	-0.049	0.000	1.50		80.5	FLOOD RISK*	
5.001	SRHdp	65.729	-0.111	0.000	0.84	0.0	77.7	FLOOD RISK*	
5.002	SRHsiphon gf	63.902	0.237	0.000	2.29		77.8	SURCHARGED*	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
4.003	SRH5	15 Summer	100	+45%	100/15 Summer				63.443
1.006	SRH4	15 Summer	100	+45%	100/15 Summer				63.217
1.007	SRH6a	15 Summer	100	+45%	100/15 Summer				62.925
1.008	SRHtank	360 Winter	100	+45%	1/240 Summer				62.881
1.009	SRH6	360 Winter	100	+45%	1/120 Summer				62.864

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.003	SRH5	0.095	0.000	1.77		233.2	SURCHARGED	
1.006	SRH4	0.100	0.000	1.70		665.8	SURCHARGED	
1.007	SRH6a	0.210	0.000	2.42		673.2	SURCHARGED	
1.008	SRHtank	1.601	0.000	0.51		28.2	SURCHARGED	
1.009	SRH6	1.643	0.000	0.13		18.0	SURCHARGED	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for washdown

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	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.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for washdown

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
W4.000	5.241	0.275	19.1	0.062	5.00	0.0	0.600	o	150	Pipe/Conduit	
W5.000	8.834	0.275	32.1	0.062	5.00	0.0	0.600	o	150	Pipe/Conduit	
W4.001	8.438	0.134	63.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
W4.002	12.708	0.150	84.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
W6.000	14.004	0.056	250.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
W6.001	2.057	0.008	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
W6.002	9.200	0.037	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
W4.003	3.172	0.235	13.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
W4.004	3.637	0.364	10.0	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)
W4.000	50.00	5.04	64.000	0.062	0.0	0.0	0.0	2.32	41.0	11.2
W5.000	50.00	5.08	64.000	0.062	0.0	0.0	0.0	1.78	31.5	11.2
W4.001	50.00	5.17	63.170	0.124	0.0	0.0	0.0	1.65	65.6	22.4
W4.002	50.00	5.32	63.036	0.124	0.0	0.0	0.0	1.42	56.5	22.4
W6.000	50.00	5.24	62.840	0.000	0.0	0.0	0.0	0.99	70.0	0.0
W6.001	50.00	5.27	62.780	0.000	0.0	0.0	0.0	0.99	70.0	0.0
W6.002	50.00	5.43	62.772	0.000	0.0	0.0	0.0	0.99	70.0	0.0
W4.003	50.00	5.44	62.729	0.124	0.0	0.0	0.0	2.76	48.7	22.4
W4.004	50.00	5.02	62.494	0.000	5.0	0.0	0.0	3.20	56.6	5.0

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Area Summary for washdown

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
4.000	-	-	100	0.062	0.062	0.062
5.000	-	-	100	0.062	0.062	0.062
4.001	-	-	100	0.000	0.000	0.000
4.002	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.000	0.000	0.000
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	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
				Total	Total	Total
				0.124	0.124	0.124

Surcharged Outfall Details for washdown

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
W4.004	WEX BS4	64.236	62.130	62.130	1200	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	62.275	300	62.275	540	62.275	780	62.275	1020	62.275	1260	62.275
120	62.275	360	62.275	600	62.275	840	62.275	1080	62.275	1320	62.275
180	62.275	420	62.275	660	62.275	900	62.275	1140	62.275	1380	62.275
240	62.275	480	62.275	720	62.275	960	62.275	1200	62.275	1440	62.275

Simulation Criteria for washdown

Volumetric Runoff Coeff	1.000	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)	18.000
Return Period (years)	2	Ratio R	0.357
Region	England and Wales	Profile Type	Summer

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Synthetic Rainfall Details

Cv (Summer) 1.000 Storm Duration (mins) 30
Cv (Winter) 0.840

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Online Controls for washdown

Hydro-Brake® Optimum Manhole: WW05, DS/PN: W4.003, Volume (m³): 2.7

Unit Reference	MD-SHE-0100-5000-1400-5000
Design Head (m)	1.400
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	100
Invert Level (m)	62.729
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	5.0
Flush-Flo™	0.416	5.0
Kick-Flo®	0.855	4.0
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	3.3	1.200	4.7	3.000	7.1	7.000	10.7
0.200	4.6	1.400	5.0	3.500	7.7	7.500	11.0
0.300	4.9	1.600	5.3	4.000	8.2	8.000	11.4
0.400	5.0	1.800	5.6	4.500	8.6	8.500	11.7
0.500	5.0	2.000	5.9	5.000	9.1	9.000	12.0
0.600	4.9	2.200	6.2	5.500	9.5	9.500	12.3
0.800	4.3	2.400	6.4	6.000	9.9		
1.000	4.3	2.600	6.7	6.500	10.3		

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Storage Structures for washdown

Cellular Storage Manhole: WTANK, DS/PN: W6.001

Invert Level (m) 62.780 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	52.0	0.0	0.801	0.0	0.0
0.800	52.0	0.0			

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

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 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
W4.000	WOU 1	15 Summer	1	+0%	100/15 Summer				64.055
W5.000	WOU 2	15 Summer	1	+0%	100/15 Summer				64.061
W4.001	WW01	15 Summer	1	+0%	100/15 Summer				63.265
W4.002	WW02	15 Summer	1	+0%	100/15 Summer				63.134
W6.000	WW03	30 Summer	1	+0%	100/15 Summer				62.869
W6.001	WTANK	30 Summer	1	+0%	30/30 Summer				62.869
W6.002	WW04	15 Summer	1	+0%	30/30 Summer				62.918
W4.003	WW05	15 Summer	1	+0%	1/15 Summer				63.068
W4.004	WW06	15 Summer	1	+0%					62.530

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.000	WOU 1	-0.095	0.000	0.29		9.4	FLOOD RISK	
W5.000	WOU 2	-0.089	0.000	0.34		9.4	FLOOD RISK	
W4.001	WW01	-0.130	0.000	0.37		18.8	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.002	WW02	-0.127	0.000	0.39		18.9	OK	
W6.000	WW03	-0.271	0.000	0.00		0.0	OK	
W6.001	WTANK	-0.211	0.000	0.05		3.0	OK*	
W6.002	WW04	-0.154	0.000	0.06		3.1	OK	
W4.003	WW05	0.189	0.000	0.16		5.0	SURCHARGED	
W4.004	WW06	-0.114	0.000	0.13		5.0	OK	

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

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 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
W4.000	WOU 1	15 Summer	30	+0%	100/15 Summer				64.094
W5.000	WOU 2	15 Summer	30	+0%	100/15 Summer				64.106
W4.001	WW01	15 Summer	30	+0%	100/15 Summer				63.354
W4.002	WW02	15 Summer	30	+0%	100/15 Summer				63.243
W6.000	WW03	60 Summer	30	+0%	100/15 Summer				63.113
W6.001	WTANK	60 Summer	30	+0%	30/30 Summer				63.113
W6.002	WW04	60 Summer	30	+0%	30/30 Summer				63.113
W4.003	WW05	60 Summer	30	+0%	1/15 Summer				63.114
W4.004	WW06	60 Summer	30	+0%					62.530

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.000	WOU 1	-0.056	0.000	0.70		23.0	FLOOD RISK	
W5.000	WOU 2	-0.044	0.000	0.83		22.9	FLOOD RISK	
W4.001	WW01	-0.041	0.000	0.89		46.2	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.002	WW02	-0.018	0.000	0.95		46.3	OK	
W6.000	WW03	-0.027	0.000	0.00		0.0	OK	
W6.001	WTANK	0.033	0.000	0.07		4.6	SURCHARGED*	
W6.002	WW04	0.042	0.000	0.09		4.6	SURCHARGED	
W4.003	WW05	0.235	0.000	0.16		5.0	SURCHARGED	
W4.004	WW06	-0.114	0.000	0.13		5.0	OK	

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

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	0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
W4.000	WOU 1	15 Summer	100	+45%	100/15 Summer				64.288
W5.000	WOU 2	15 Summer	100	+45%	100/15 Summer				64.341
W4.001	WW01	120 Winter	100	+45%	100/15 Summer				64.170
W4.002	WW02	120 Winter	100	+45%	100/15 Summer				64.164
W6.000	WW03	120 Winter	100	+45%	100/15 Summer				64.155
W6.001	WTANK	240 Summer	100	+45%	30/30 Summer				63.581
W6.002	WW04	120 Winter	100	+45%	30/30 Summer				64.156
W4.003	WW05	120 Winter	100	+45%	1/15 Summer				64.156
W4.004	WW06	120 Winter	100	+45%					62.530

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.000	WOU 1	0.138	0.000	1.21		39.8	FLOOD RISK	
W5.000	WOU 2	0.191	0.000	1.31		36.2	FLOOD RISK	
W4.001	WW01	0.775	0.000	0.53		27.5	FLOOD RISK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
W4.002	WW02	0.903	0.000	0.56		27.1	FLOOD RISK	
W6.000	WW03	1.015	0.000	0.00		0.2	FLOOD RISK	
W6.001	WTANK	0.501	0.000	0.10		6.1	SURCHARGED*	
W6.002	WW04	1.084	0.000	0.10		5.5	FLOOD RISK	
W4.003	WW05	1.277	0.000	0.17		5.0	FLOOD RISK	
W4.004	WW06	-0.114	0.000	0.13		5.0	OK	

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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)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	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.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	0.552	0.010	55.2	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	10.487	0.525	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	0.552	0.010	55.2	0.062	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	5.584	0.279	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	9.958	0.033	301.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	20.780	0.069	300.0	0.000	0.00	0.0	0.600	oo	-1	Pipe/Conduit	
S3.000	1.029	0.010	102.9	0.115	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	6.276	0.209	30.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.000	1.016	0.010	101.6	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.01	62.563	0.041	0.0	0.0	0.0	1.36	24.0	7.3
S1.001	50.00	5.08	62.439	0.041	0.0	0.0	0.0	2.26	40.0	7.3
S2.000	50.00	5.01	62.130	0.062	0.0	0.0	0.0	1.76	70.1	11.2
S2.001	50.00	5.05	62.074	0.062	0.0	0.0	0.0	2.26	40.0	11.2
S1.002	50.00	5.27	60.350	0.103	0.0	0.0	0.0	0.90	63.6	18.6
S1.003	50.00	5.65	60.317	0.103	0.0	0.0	0.0	0.90	127.6	18.6
S3.000	50.00	5.01	61.400	0.115	0.0	0.0	0.0	1.29	51.2	20.8
S3.001	50.00	5.06	61.100	0.115	0.0	0.0	0.0	2.40	95.3	20.8
S4.000	50.00	5.02	61.878	0.047	0.0	0.0	0.0	1.00	17.6	8.6

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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
S4.001	14.624	0.585	25.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S5.000	0.505	0.010	50.5	0.068	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	4.674	0.234	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	7.755	0.052	149.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	37.854	1.352	28.0	0.012	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	8.570	1.182	7.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	5.499	0.275	20.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	9.192	0.065	141.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	4.986	0.033	151.1	0.000	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)
S4.001	50.00	5.14	61.494	0.047	0.0	0.0	0.0	2.02	35.7	8.6
S5.000	50.00	5.00	61.469	0.068	0.0	0.0	0.0	1.84	73.4	12.3
S5.001	50.00	5.04	61.169	0.068	0.0	0.0	0.0	2.26	40.0	12.3
S1.004	50.00	5.75	60.247	0.334	0.0	0.0	0.0	1.29	90.8	60.3
S6.000	50.00	5.25	60.340	0.012	0.0	0.0	0.0	2.48	98.7	2.1
S6.001	50.00	5.28	58.952	0.012	0.0	0.0	0.0	4.89	194.4	2.1
S6.002	50.00	5.31	57.760	0.012	0.0	0.0	0.0	2.94	116.9	2.1
S6.003	50.00	5.42	57.335	0.012	0.0	0.0	0.0	1.52	168.1	2.1
S1.005	50.00	5.81	57.270	0.346	0.0	0.0	0.0	1.47	162.5	62.4

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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	User	-	100	0.041	0.041	0.041
1.001	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.062	0.062	0.062
2.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.002	0.002	0.002
	User	-	100	0.113	0.113	0.115
3.001	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.047	0.047	0.047
4.001	-	-	100	0.000	0.000	0.000
5.000	User	-	100	0.068	0.068	0.068
5.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
6.000	User	-	100	0.012	0.012	0.012
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
6.003	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.346	0.346	0.346

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	S	61.410	57.237	0.000	0	0

Datum (m) 57.237 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	1.900	300	1.900	540	1.900	780	1.900	1020	1.900	1260	1.900
120	1.900	360	1.900	600	1.900	840	1.900	1080	1.900	1320	1.900
180	1.900	420	1.900	660	1.900	900	1.900	1140	1.900	1380	1.900
240	1.900	480	1.900	720	1.900	960	1.900	1200	1.900	1440	1.900

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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 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)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S2, DS/PN: S1.004, Volume (m³): 6.5

Unit Reference	MD-SHE-0115-7000-1600-7000
Design Head (m)	1.600
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	115
Invert Level (m)	60.247
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	7.0
Flush-Flo™	0.476	7.0
Kick-Flo®	0.977	5.6
Mean Flow over Head Range	-	6.1

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	4.0	1.200	6.1	3.000	9.4	7.000	14.1
0.200	6.2	1.400	6.6	3.500	10.1	7.500	14.5
0.300	6.7	1.600	7.0	4.000	10.8	8.000	15.0
0.400	6.9	1.800	7.4	4.500	11.4	8.500	15.4
0.500	7.0	2.000	7.8	5.000	12.0	9.000	15.9
0.600	6.9	2.200	8.1	5.500	12.5	9.500	16.3
0.800	6.5	2.400	8.5	6.000	13.1		
1.000	5.6	2.600	8.8	6.500	13.6		

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Storage Structures for Storm

Cellular Storage Manhole: Stank, DS/PN: S1.003

Invert Level (m) 60.321 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	154.0	0.0	1.201	0.0	0.0
1.200	154.0	0.0			

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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 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.000	Schannel 1	15 Summer	1	+0%	30/15 Summer		
S1.001	Soutlet 1	15 Summer	1	+0%			
S2.000	Schannel 2	15 Summer	1	+0%	100/15 Summer		
S2.001	Soutlet 2	15 Summer	1	+0%	100/15 Summer		
S1.002	S1	15 Summer	1	+0%	30/30 Summer		
S1.003	Stank	120 Summer	1	+0%	30/30 Summer		
S3.000	Schannel 3	15 Summer	1	+0%	30/15 Summer	100/15 Summer	
S3.001	Soutlet 3	15 Summer	1	+0%	100/15 Summer		
S4.000	Schannel 4	15 Summer	1	+0%	30/15 Summer		
S4.001	Soutlet 4	15 Summer	1	+0%			
S5.000	Schannel 5	15 Summer	1	+0%	100/15 Summer		
S5.001	Soutlet 5	15 Summer	1	+0%	100/15 Summer		
S1.004	S2	15 Summer	1	+0%	30/15 Summer		
S6.000	Sjunction	15 Summer	1	+0%			
S6.001	Sex30	120 Summer	1	+0%			
S6.002	Sex29	120 Summer	1	+0%	1/15 Summer		
S6.003	Sjunction	120 Winter	1	+0%			
S1.005	S3	120 Summer	1	+0%	1/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	Schannel 1		62.643	-0.070	0.000	0.55		6.0	FLOOD RISK
S1.001	Soutlet 1		62.480	-0.109	0.000	0.17		6.0	OK
S2.000	Schannel 2		62.216	-0.139	0.000	0.31		9.2	OK
S2.001	Soutlet 2		62.128	-0.096	0.000	0.28		9.2	OK
S1.002	S1		60.464	-0.186	0.000	0.30		15.1	OK
S1.003	Stank		60.454	-0.163	0.000	0.04		4.8	OK
S3.000	Schannel 3		61.518	-0.107	0.000	0.53		15.8	OK
S3.001	Soutlet 3		61.176	-0.149	0.000	0.25		15.8	OK
S4.000	Schannel 4		61.965	-0.063	0.000	0.62		6.7	FLOOD RISK
S4.001	Soutlet 4		61.540	-0.104	0.000	0.20		6.7	OK
S5.000	Schannel 5		61.559	-0.135	0.000	0.34		10.1	OK
S5.001	Soutlet 5		61.229	-0.090	0.000	0.33		10.0	OK
S1.004	S2		60.476	-0.071	0.000	0.10		6.4	OK
S6.000	Sjunction		60.359	-0.206	0.000	0.02		1.8	OK*
S6.001	Sex30		59.142	-0.035	0.000	0.01		0.9	OK
S6.002	Sex29		59.140	1.155	0.000	0.01		0.9	SURCHARGED
S6.003	Sjunction		57.710	0.000	0.000	0.01		0.6	SURCHARGED*
S1.005	S3		59.139	1.494	0.000	0.07		6.9	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	Schannel 1	
S1.001	Soutlet 1	
S2.000	Schannel 2	
S2.001	Soutlet 2	
S1.002	S1	
S1.003	Stank	
S3.000	Schannel 3	1
S3.001	Soutlet 3	
S4.000	Schannel 4	
S4.001	Soutlet 4	
S5.000	Schannel 5	
S5.001	Soutlet 5	
S1.004	S2	
S6.000	Sjunction	
S6.001	Sex30	
S6.002	Sex29	
S6.003	Sjunction	
S1.005	S3	

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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 0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.000	Schannel 1	15 Summer	30	+0%	30/15 Summer		
S1.001	Soutlet 1	15 Summer	30	+0%			
S2.000	Schannel 2	15 Summer	30	+0%	100/15 Summer		
S2.001	Soutlet 2	15 Summer	30	+0%	100/15 Summer		
S1.002	S1	120 Winter	30	+0%	30/30 Summer		
S1.003	Stank	120 Winter	30	+0%	30/30 Summer		
S3.000	Schannel 3	15 Summer	30	+0%	30/15 Summer	100/15 Summer	
S3.001	Soutlet 3	15 Summer	30	+0%	100/15 Summer		
S4.000	Schannel 4	15 Summer	30	+0%	30/15 Summer		
S4.001	Soutlet 4	15 Summer	30	+0%			
S5.000	Schannel 5	15 Summer	30	+0%	100/15 Summer		
S5.001	Soutlet 5	15 Summer	30	+0%	100/15 Summer		
S1.004	S2	120 Summer	30	+0%	30/15 Summer		
S6.000	Sjunction	15 Summer	30	+0%			
S6.001	Sex30	120 Summer	30	+0%			
S6.002	Sex29	120 Summer	30	+0%	1/15 Summer		
S6.003	Sjunction	120 Winter	30	+0%			
S1.005	S3	120 Summer	30	+0%	1/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	Schannel 1		62.751	0.038	0.000	1.30		14.1	FLOOD RISK
S1.001	Soutlet 1		62.506	-0.083	0.000	0.40		14.2	OK
S2.000	Schannel 2		62.279	-0.076	0.000	0.76		22.9	OK
S2.001	Soutlet 2		62.166	-0.058	0.000	0.69		22.9	OK
S1.002	S1		60.794	0.144	0.000	0.24		12.0	SURCHARGED
S1.003	Stank		60.792	0.175	0.000	0.09		9.8	SURCHARGED
S3.000	Schannel 3		61.670	0.045	0.000	1.18		35.4	FLOOD RISK
S3.001	Soutlet 3		61.219	-0.106	0.000	0.54		35.0	OK
S4.000	Schannel 4		62.081	0.053	0.000	1.48		16.1	FLOOD RISK
S4.001	Soutlet 4		61.569	-0.075	0.000	0.49		16.2	OK
S5.000	Schannel 5		61.628	-0.066	0.000	0.84		25.0	FLOOD RISK
S5.001	Soutlet 5		61.273	-0.046	0.000	0.82		24.9	OK
S1.004	S2		60.875	0.328	0.000	0.11		7.0	SURCHARGED
S6.000	Sjunction		60.370	-0.195	0.000	0.04		4.4	OK*
S6.001	Sex30		59.146	-0.031	0.000	0.01		2.1	OK
S6.002	Sex29		59.143	1.158	0.000	0.03		2.1	SURCHARGED
S6.003	Sjunction		57.710	0.000	0.000	0.01		1.4	SURCHARGED*
S1.005	S3		59.139	1.494	0.000	0.09		8.9	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	Schannel 1	
S1.001	Soutlet 1	
S2.000	Schannel 2	
S2.001	Soutlet 2	
S1.002	S1	
S1.003	Stank	
S3.000	Schannel 3	1
S3.001	Soutlet 3	
S4.000	Schannel 4	
S4.001	Soutlet 4	
S5.000	Schannel 5	
S5.001	Soutlet 5	
S1.004	S2	
S6.000	Sjunction	
S6.001	Sex30	
S6.002	Sex29	
S6.003	Sjunction	
S1.005	S3	

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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	0.357
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.000	Schannel 1	15 Summer	100	+45%	30/15 Summer		
S1.001	Soutlet 1	15 Summer	100	+45%			
S2.000	Schannel 2	15 Summer	100	+45%	100/15 Summer		
S2.001	Soutlet 2	15 Summer	100	+45%	100/15 Summer		
S1.002	S1	240 Winter	100	+45%	30/30 Summer		
S1.003	Stank	240 Winter	100	+45%	30/30 Summer		
S3.000	Schannel 3	15 Summer	100	+45%	30/15 Summer	100/15 Summer	
S3.001	Soutlet 3	180 Winter	100	+45%	100/15 Summer		
S4.000	Schannel 4	15 Summer	100	+45%	30/15 Summer		
S4.001	Soutlet 4	180 Winter	100	+45%			
S5.000	Schannel 5	15 Summer	100	+45%	100/15 Summer		
S5.001	Soutlet 5	15 Summer	100	+45%	100/15 Summer		
S1.004	S2	180 Winter	100	+45%	30/15 Summer		
S6.000	Sjunction	15 Summer	100	+45%			
S6.001	Sex30	120 Summer	100	+45%			
S6.002	Sex29	120 Summer	100	+45%	1/15 Summer		
S6.003	Sjunction	120 Winter	100	+45%			
S1.005	S3	120 Summer	100	+45%	1/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	Schannel 1		62.883	0.170	0.000	2.46		26.7	FLOOD RISK
S1.001	Soutlet 1		62.537	-0.052	0.000	0.74		26.5	OK
S2.000	Schannel 2		62.445	0.090	0.000	1.35		40.3	FLOOD RISK
S2.001	Soutlet 2		62.361	0.137	0.000	1.22		40.1	SURCHARGED
S1.002	S1		61.512	0.862	0.000	0.28		13.9	SURCHARGED
S1.003	Stank		61.511	0.894	0.000	0.08		8.5	SURCHARGED
S3.000	Schannel 3		61.850	0.225	0.238	2.34		69.8	FLOOD
S3.001	Soutlet 3		61.591	0.266	0.000	0.30		19.6	FLOOD RISK
S4.000	Schannel 4		62.237	0.209	0.000	2.71		29.4	FLOOD RISK
S4.001	Soutlet 4		61.607	-0.037	0.000	0.25		8.1	OK
S5.000	Schannel 5		61.786	0.092	0.000	1.56		46.7	FLOOD RISK
S5.001	Soutlet 5		61.633	0.314	0.000	1.54		46.5	FLOOD RISK
S1.004	S2		61.602	1.055	0.000	0.11		7.0	SURCHARGED
S6.000	Sjunction		60.383	-0.182	0.000	0.08		8.1	OK*
S6.001	Sex30		59.150	-0.027	0.000	0.03		3.9	OK
S6.002	Sex29		59.145	1.160	0.000	0.05		3.9	SURCHARGED
S6.003	Sjunction		57.710	0.000	0.000	0.02		2.6	SURCHARGED*
S1.005	S3		59.140	1.495	0.000	0.11		10.6	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	Schannel 1	
S1.001	Soutlet 1	
S2.000	Schannel 2	
S2.001	Soutlet 2	
S1.002	S1	
S1.003	Stank	
S3.000	Schannel 3	1
S3.001	Soutlet 3	
S4.000	Schannel 4	
S4.001	Soutlet 4	
S5.000	Schannel 5	
S5.001	Soutlet 5	
S1.004	S2	
S6.000	Sjunction	
S6.001	Sex30	
S6.002	Sex29	
S6.003	Sjunction	
S1.005	S3	

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
OU2	0.096	5.00	64.363	450	450	388184.011	396869.882	1.100
OU1	0.025	5.00	64.312	450	450	388243.207	396855.808	1.000
CP01	0.056	5.00	64.119	1200		388224.470	396863.140	1.129
PI			64.205	600		388227.098	396873.038	1.326
CP02		5.00	64.102	600		388227.855	396864.050	1.500
CP03			64.250	1200		388231.194	396876.506	1.700
CP04			64.231	1200		388228.176	396877.310	1.693
CP05			64.233	1200		388225.157	396878.114	2.456
EX MH1			64.520	1200		388234.313	396913.353	3.332

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	OU2	CP01	41.017	0.600	63.263	62.990	0.273	150.0	225	5.64	50.0
2.000	OU1	CP01	20.120	0.600	63.312	63.111	0.201	100.0	150	5.33	50.0
1.001	CP01	PI	10.241	0.600	62.990	62.929	0.061	167.0	225	5.81	50.0
1.002	PI	CP04	4.406	0.600	62.879	62.853	0.026	167.0	225	5.88	50.0
3.000	CP02	CP03	12.896	0.600	62.602	62.550	0.052	250.0	300	5.22	50.0
3.001	CP03	CP04	3.123	0.600	62.550	62.538	0.012	250.0	300	5.27	50.0
1.003	CP04	CP05	3.124	0.600	62.538	62.507	0.031	100.0	150	5.94	50.0
1.004	CP05	EX MH1	36.409	0.600	61.777	61.188	0.589	61.8	225	6.19	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

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Node EX MH1 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to 100yr+45% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	1.750	300	1.750	600	1.750	900	1.750	1200	1.750
60	1.750	360	1.750	660	1.750	960	1.750	1260	1.750
120	1.750	420	1.750	720	1.750	1020	1.750	1320	1.750
180	1.750	480	1.750	780	1.750	1080	1.750	1380	1.750
240	1.750	540	1.750	840	1.750	1140	1.750	1440	1.750

Node CP04 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	62.538	Product Number	CTL-SHE-0098-5000-1500-5000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node CP03 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	204

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	80.0	0.0	0.800	80.0	0.0	0.801	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	1 year 960 minute winter	3.745	1.489
1 year 15 minute winter	64.927	26.180	1 year 1440 minute summer	4.127	1.106
1 year 30 minute summer	60.022	16.984	1 year 1440 minute winter	2.773	1.106
1 year 30 minute winter	42.121	16.984	30 year 15 minute summer	226.195	64.005
1 year 60 minute summer	40.398	10.676	30 year 15 minute winter	158.733	64.005
1 year 60 minute winter	26.839	10.676	30 year 30 minute summer	147.452	41.724
1 year 120 minute summer	24.980	6.602	30 year 30 minute winter	103.475	41.724
1 year 120 minute winter	16.596	6.602	30 year 60 minute summer	98.615	26.061
1 year 180 minute summer	19.271	4.959	30 year 60 minute winter	65.517	26.061
1 year 180 minute winter	12.527	4.959	30 year 120 minute summer	59.946	15.842
1 year 240 minute summer	15.301	4.043	30 year 120 minute winter	39.827	15.842
1 year 240 minute winter	10.165	4.043	30 year 180 minute summer	45.598	11.734
1 year 360 minute summer	11.775	3.030	30 year 180 minute winter	29.640	11.734
1 year 360 minute winter	7.654	3.030	30 year 240 minute summer	35.759	9.450
1 year 480 minute summer	9.342	2.469	30 year 240 minute winter	23.758	9.450
1 year 480 minute winter	6.207	2.469	30 year 360 minute summer	26.939	6.932
1 year 600 minute summer	7.682	2.101	30 year 360 minute winter	17.511	6.932
1 year 600 minute winter	5.249	2.101	30 year 480 minute summer	20.981	5.545
1 year 720 minute summer	6.859	1.838	30 year 480 minute winter	13.940	5.545
1 year 720 minute winter	4.609	1.838	30 year 600 minute summer	17.039	4.661
1 year 960 minute summer	5.653	1.489	30 year 600 minute winter	11.642	4.661

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 720 minute summer	15.093	4.045	100 year +45% CC 180 minute winter	56.520	22.375
30 year 720 minute winter	10.143	4.045	100 year +45% CC 240 minute summer	68.114	18.001
30 year 960 minute summer	12.278	3.233	100 year +45% CC 240 minute winter	45.253	18.001
30 year 960 minute winter	8.133	3.233	100 year +45% CC 360 minute summer	51.133	13.158
30 year 1440 minute summer	8.788	2.355	100 year +45% CC 360 minute winter	33.238	13.158
30 year 1440 minute winter	5.906	2.355	100 year +45% CC 480 minute summer	39.658	10.480
100 year +45% CC 15 minute summer	423.061	119.712	100 year +45% CC 480 minute winter	26.348	10.480
100 year +45% CC 15 minute winter	296.885	119.712	100 year +45% CC 600 minute summer	32.099	8.780
100 year +45% CC 30 minute summer	278.374	78.770	100 year +45% CC 600 minute winter	21.932	8.780
100 year +45% CC 30 minute winter	195.350	78.770	100 year +45% CC 720 minute summer	28.365	7.602
100 year +45% CC 60 minute summer	187.417	49.529	100 year +45% CC 720 minute winter	19.063	7.602
100 year +45% CC 60 minute winter	124.515	49.529	100 year +45% CC 960 minute summer	22.984	6.052
100 year +45% CC 120 minute summer	114.312	30.209	100 year +45% CC 960 minute winter	15.225	6.052
100 year +45% CC 120 minute winter	75.946	30.209	100 year +45% CC 1440 minute summer	16.353	4.383
100 year +45% CC 180 minute summer	86.951	22.375	100 year +45% CC 1440 minute winter	10.990	4.383

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Results for 1 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU2	10	63.341	0.078	11.4	0.1522	0.0000	OK
15 minute winter	OU1	10	63.354	0.042	3.0	0.0294	0.0000	OK
15 minute winter	CP01	11	63.113	0.123	20.7	0.2607	0.0000	OK
15 minute winter	PI	11	63.007	0.128	20.4	0.0362	0.0000	OK
30 minute winter	CP02	28	62.680	0.078	0.4	0.0222	0.0000	OK
30 minute winter	CP03	28	62.680	0.130	12.0	6.6212	0.0000	OK
30 minute winter	CP04	28	62.680	0.142	15.9	0.1610	0.0000	OK
30 minute winter	CP05	28	61.815	0.038	4.0	0.0430	0.0000	OK
30 minute winter	EX MH1	28	61.226	0.038	4.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU2	1.000	CP01	11.1	0.659	0.263	0.7030	
15 minute winter	OU1	2.000	CP01	2.9	0.735	0.163	0.0794	
15 minute winter	CP01	1.001	PI	20.4	0.972	0.510	0.2153	
15 minute winter	PI	1.002	CP04	20.5	0.945	0.510	0.0954	
30 minute winter	CP02	3.000	CP03	-0.4	-0.036	-0.005	0.2838	
30 minute winter	CP03	3.001	CP04	-12.0	-0.554	-0.171	0.0973	
30 minute winter	CP04	Hydro-Brake®	CP05	4.0				
30 minute winter	CP05	1.004	EX MH1	4.0	0.923	0.061	0.1594	12.6

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Results for 30 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU2	10	63.394	0.131	28.0	0.2544	0.0000	OK
15 minute winter	OU1	10	63.378	0.066	7.3	0.0467	0.0000	OK
15 minute winter	CP01	11	63.266	0.276	51.0	0.5861	0.0000	SURCHARGED
15 minute winter	PI	11	63.132	0.253	49.5	0.0715	0.0000	SURCHARGED
60 minute winter	CP02	55	62.887	0.285	0.7	0.0806	0.0000	OK
60 minute winter	CP03	55	62.887	0.337	21.4	23.3580	0.0000	SURCHARGED
60 minute winter	CP04	55	62.887	0.349	26.3	0.3944	0.0000	SURCHARGED
60 minute winter	CP05	55	61.819	0.042	4.9	0.0470	0.0000	OK
60 minute winter	EX MH1	55	61.229	0.041	4.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU2	1.000	CP01	27.5	0.785	0.648	1.3056	
15 minute winter	OU1	2.000	CP01	7.2	0.849	0.406	0.2509	
15 minute winter	CP01	1.001	PI	49.5	1.245	1.233	0.3966	
15 minute winter	PI	1.002	CP04	49.5	1.260	1.233	0.1646	
60 minute winter	CP02	3.000	CP03	-0.7	-0.024	-0.010	0.8996	
60 minute winter	CP03	3.001	CP04	-21.4	-0.484	-0.306	0.2199	
60 minute winter	CP04	Hydro-Brake®	CP05	4.9				
60 minute winter	CP05	1.004	EX MH1	4.9	0.974	0.073	0.1814	38.7

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU2	11	64.149	0.886	52.3	1.7255	0.0000	FLOOD RISK
15 minute winter	OU1	11	63.859	0.547	13.6	0.3846	0.0000	SURCHARGED
15 minute winter	CP01	11	63.747	0.757	88.5	1.6073	0.0000	SURCHARGED
240 minute winter	PI	184	63.469	0.590	17.6	0.1669	0.0000	SURCHARGED
240 minute winter	CP02	184	63.468	0.866	0.3	0.2451	0.0000	SURCHARGED
240 minute winter	CP03	184	63.467	0.917	14.2	65.1171	0.0000	SURCHARGED
240 minute winter	CP04	184	63.468	0.930	17.2	1.0515	0.0000	SURCHARGED
60 minute summer	CP05	34	62.946	1.169	4.7	1.3219	0.0000	SURCHARGED
15 minute summer	EX MH1	1	62.938	1.750	2.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU2	1.000	CP01	47.8	1.202	1.129	1.6313	
15 minute winter	OU1	2.000	CP01	12.2	0.829	0.689	0.3542	
15 minute winter	CP01	1.001	PI	87.2	2.194	2.175	0.4073	
240 minute winter	PI	1.002	CP04	17.2	0.868	0.429	0.1752	
240 minute winter	CP02	3.000	CP03	-0.3	-0.020	-0.004	0.9081	
240 minute winter	CP03	3.001	CP04	-14.2	-0.248	-0.203	0.2199	
240 minute winter	CP04	Hydro-Brake®	CP05	4.9				
60 minute summer	CP05	1.004	EX MH1	4.7	0.119	0.072	1.4480	32.9

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Appendix H

Existing Surface Water Flows calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
END 1	0.035	5.00	64.560		388153.184	396888.711	2.550
MH8	0.035	5.00	64.290	1200	388158.667	396939.466	0.540
MH9	0.035	5.00	64.280	1200	388160.137	396941.537	0.630
END 2	0.035	5.00	64.320		388174.482	396937.195	1.250
MH10	0.035	5.00	64.440	1200	388167.198	396939.714	3.240
OF			64.240	1200	388169.872	396949.660	3.143

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	END 1	MH10	52.910	0.600	62.010	61.275	0.735	72.0	150	5.74	50.0
2.000	MH8	MH9	2.540	0.600	63.750	63.650	0.100	25.4	150	5.02	50.0
2.001	MH9	MH10	7.293	0.600	63.650	63.190	0.460	15.9	150	5.07	50.0
3.000	END 2	MH10	7.707	0.600	63.070	62.890	0.180	42.8	150	5.08	50.0
1.001	MH10	OF	10.299	0.600	61.200	61.097	0.103	100.0	225	5.87	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year 15 minute summer	291.766	82.560
1 year 360 minute winter	7.654	3.030	100 year 15 minute winter	204.748	82.560
1 year 480 minute summer	9.342	2.469	100 year 30 minute summer	191.982	54.324
1 year 480 minute winter	6.207	2.469	100 year 30 minute winter	134.724	54.324
1 year 600 minute summer	7.682	2.101	100 year 60 minute summer	129.253	34.158
1 year 600 minute winter	5.249	2.101	100 year 60 minute winter	85.873	34.158
1 year 720 minute summer	6.859	1.838	100 year 120 minute summer	78.836	20.834
1 year 720 minute winter	4.609	1.838	100 year 120 minute winter	52.377	20.834
1 year 960 minute summer	5.653	1.489	100 year 180 minute summer	59.966	15.431
1 year 960 minute winter	3.745	1.489	100 year 180 minute winter	38.980	15.431
1 year 1440 minute summer	4.127	1.106	100 year 240 minute summer	46.975	12.414
1 year 1440 minute winter	2.773	1.106	100 year 240 minute winter	31.209	12.414
30 year 15 minute summer	226.195	64.005	100 year 360 minute summer	35.264	9.075
30 year 15 minute winter	158.733	64.005	100 year 360 minute winter	22.923	9.075
30 year 30 minute summer	147.452	41.724	100 year 480 minute summer	27.350	7.228
30 year 30 minute winter	103.475	41.724	100 year 480 minute winter	18.171	7.228
30 year 60 minute summer	98.615	26.061	100 year 600 minute summer	22.137	6.055
30 year 60 minute winter	65.517	26.061	100 year 600 minute winter	15.126	6.055
30 year 120 minute summer	59.946	15.842	100 year 720 minute summer	19.562	5.243
30 year 120 minute winter	39.827	15.842	100 year 720 minute winter	13.147	5.243
30 year 180 minute summer	45.598	11.734	100 year 960 minute summer	15.851	4.174
30 year 180 minute winter	29.640	11.734	100 year 960 minute winter	10.500	4.174
30 year 240 minute summer	35.759	9.450	100 year 1440 minute summer	11.278	3.023
30 year 240 minute winter	23.758	9.450	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	END 1	11	62.054	0.044	4.2	0.0122	0.0000	OK
15 minute winter	MH8	10	63.788	0.038	4.2	0.0921	0.0000	OK
15 minute winter	MH9	10	63.696	0.046	8.3	0.1040	0.0000	OK
15 minute winter	END 2	10	63.111	0.041	4.2	0.0228	0.0000	OK
15 minute winter	MH10	10	61.306	0.106	20.4	0.1431	0.0000	OK
15 minute winter	OF	10	61.194	0.097	20.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	END 1	1.000	MH10	4.0	0.917	0.191	0.2305	
15 minute winter	MH8	2.000	MH9	4.1	1.020	0.117	0.0103	
15 minute winter	MH9	2.001	MH10	8.2	1.857	0.183	0.0323	
15 minute winter	END 2	3.000	MH10	4.1	1.097	0.152	0.0291	
15 minute winter	MH10	1.001	OF	20.2	1.167	0.389	0.1788	9.6

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	END 1	10	62.083	0.073	10.2	0.0200	0.0000	OK
15 minute winter	MH8	10	63.816	0.066	10.2	0.1600	0.0000	OK
15 minute winter	MH9	10	63.729	0.079	20.3	0.1761	0.0000	OK
15 minute winter	END 2	10	63.136	0.066	10.2	0.0371	0.0000	OK
15 minute winter	MH10	11	61.403	0.203	50.4	0.2737	0.0000	OK
15 minute winter	OF	11	61.270	0.173	49.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	END 1	1.000	MH10	10.0	0.983	0.476	0.6445	
15 minute winter	MH8	2.000	MH9	10.1	1.202	0.284	0.0213	
15 minute winter	MH9	2.001	MH10	20.1	2.306	0.448	0.0636	
15 minute winter	END 2	3.000	MH10	10.1	1.391	0.371	0.0561	
15 minute winter	MH10	1.001	OF	49.5	1.397	0.953	0.3632	23.5

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	END 1	10	62.095	0.085	13.1	0.0233	0.0000	OK
15 minute winter	MH8	10	63.829	0.079	13.1	0.1910	0.0000	OK
15 minute winter	MH9	10	63.743	0.093	26.1	0.2088	0.0000	OK
15 minute winter	END 2	10	63.147	0.077	13.1	0.0431	0.0000	OK
15 minute winter	MH10	11	61.524	0.324	64.8	0.4364	0.0000	SURCHARGED
15 minute winter	OF	11	61.301	0.204	63.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	END 1	1.000	MH10	12.9	0.971	0.614	0.7372	
15 minute winter	MH8	2.000	MH9	13.0	1.243	0.366	0.0265	
15 minute winter	MH9	2.001	MH10	25.9	2.428	0.575	0.0776	
15 minute winter	END 2	3.000	MH10	13.0	1.479	0.477	0.0678	
15 minute winter	MH10	1.001	OF	63.7	1.603	1.226	0.3996	30.2

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
IS1	0.110	5.00	64.210	1200	388197.589	396883.346	0.600
OU	0.076	5.00	64.310	450	388191.325	396912.170	0.700
JUN	0.110	5.00	64.310		388187.662	396914.177	1.092
MH7	0.110	5.00	64.290	1350	388184.940	396922.689	1.180
MH3	0.060	5.00	64.240	1200	388161.516	396964.037	0.770
MH4	0.060	5.00	64.250	1200	388182.456	396957.895	1.280
MH5	0.060	5.00	64.270	1200	388185.198	396941.912	1.590
MH6-OF			64.330	1200	388191.134	396940.020	1.830

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	IS1	JUN	32.390	0.600	63.610	63.218	0.392	82.6	100	5.54	50.0
2.000	OU	JUN	4.177	0.600	63.610	63.218	0.392	10.7	100	5.07	50.0
1.001	JUN	MH7	8.936	0.600	63.218	63.110	0.108	82.7	100	5.69	50.0
1.002	MH7	MH5	19.225	0.600	63.110	62.680	0.430	44.7	100	5.98	50.0
4.000	MH3	MH4	6.095	0.600	63.470	62.970	0.500	12.2	100	5.07	50.0
3.001	MH4	MH5	21.822	0.600	62.970	62.680	0.290	75.2	100	5.53	50.0
1.003	MH5	MH6-OF	6.230	0.600	62.680	62.500	0.180	34.6	100	6.08	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year 15 minute summer	291.766	82.560
1 year 360 minute winter	7.654	3.030	100 year 15 minute winter	204.748	82.560
1 year 480 minute summer	9.342	2.469	100 year 30 minute summer	191.982	54.324
1 year 480 minute winter	6.207	2.469	100 year 30 minute winter	134.724	54.324
1 year 600 minute summer	7.682	2.101	100 year 60 minute summer	129.253	34.158
1 year 600 minute winter	5.249	2.101	100 year 60 minute winter	85.873	34.158
1 year 720 minute summer	6.859	1.838	100 year 120 minute summer	78.836	20.834
1 year 720 minute winter	4.609	1.838	100 year 120 minute winter	52.377	20.834
1 year 960 minute summer	5.653	1.489	100 year 180 minute summer	59.966	15.431
1 year 960 minute winter	3.745	1.489	100 year 180 minute winter	38.980	15.431
1 year 1440 minute summer	4.127	1.106	100 year 240 minute summer	46.975	12.414
1 year 1440 minute winter	2.773	1.106	100 year 240 minute winter	31.209	12.414
30 year 15 minute summer	226.195	64.005	100 year 360 minute summer	35.264	9.075
30 year 15 minute winter	158.733	64.005	100 year 360 minute winter	22.923	9.075
30 year 30 minute summer	147.452	41.724	100 year 480 minute summer	27.350	7.228
30 year 30 minute winter	103.475	41.724	100 year 480 minute winter	18.171	7.228
30 year 60 minute summer	98.615	26.061	100 year 600 minute summer	22.137	6.055
30 year 60 minute winter	65.517	26.061	100 year 600 minute winter	15.126	6.055
30 year 120 minute summer	59.946	15.842	100 year 720 minute summer	19.562	5.243
30 year 120 minute winter	39.827	15.842	100 year 720 minute winter	13.147	5.243
30 year 180 minute summer	45.598	11.734	100 year 960 minute summer	15.851	4.174
30 year 180 minute winter	29.640	11.734	100 year 960 minute winter	10.500	4.174
30 year 240 minute summer	35.759	9.450	100 year 1440 minute summer	11.278	3.023
30 year 240 minute winter	23.758	9.450	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	IS1	19	64.210	0.600	11.7	2.8788	4.0680	FLOOD
15 minute winter	OU	12	64.310	0.700	9.2	1.6310	1.0475	FLOOD
15 minute winter	JUN	12	64.310	1.092	16.8	2.2155	0.0000	FLOOD RISK
15 minute winter	MH7	13	64.273	1.163	20.5	3.8327	0.0000	FLOOD RISK
15 minute winter	MH3	14	63.820	0.350	7.1	0.9420	0.0000	SURCHARGED
15 minute winter	MH4	14	63.799	0.829	12.4	1.7142	0.0000	SURCHARGED
15 minute winter	MH5	13	63.544	0.864	22.5	1.6287	0.0000	SURCHARGED
15 minute winter	MH6-OF	30	62.600	0.100	20.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	IS1	1.000	JUN	4.4	0.574	0.668	0.2534	
15 minute winter	OU	2.000	JUN	4.6	0.758	0.248	0.0327	
15 minute winter	JUN	1.001	MH7	8.6	1.098	1.292	0.0699	
15 minute winter	MH7	1.002	MH5	10.9	1.396	1.203	0.1504	
15 minute winter	MH3	4.000	MH4	5.7	0.855	0.325	0.0477	
15 minute winter	MH4	3.001	MH5	6.4	0.814	0.914	0.1707	
15 minute winter	MH5	1.003	MH6-OF	20.8	2.662	2.016	0.0486	28.0

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	IS1	80	64.210	0.600	10.7	2.8788	25.3979	FLOOD
60 minute winter	OU	26	64.310	0.700	18.1	1.6310	15.8615	FLOOD
15 minute summer	JUN	9	64.310	1.092	30.5	2.7305	0.0000	FLOOD RISK
30 minute winter	MH7	15	64.290	1.180	32.8	3.8893	10.7255	FLOOD
30 minute winter	MH3	17	64.240	0.770	15.5	2.0705	5.3899	FLOOD
15 minute winter	MH4	10	64.250	1.280	17.6	2.6470	1.6836	FLOOD
15 minute winter	MH5	11	64.096	1.416	31.3	2.6707	0.0000	FLOOD RISK
15 minute summer	MH6-OF	33	62.600	0.100	25.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	IS1	1.000	JUN	3.4	0.472	0.519	0.2534	
60 minute winter	OU	2.000	JUN	-6.8	-0.866	-0.362	0.0327	
15 minute summer	JUN	1.001	MH7	10.0	1.274	1.500	0.0699	
30 minute winter	MH7	1.002	MH5	10.8	1.386	1.195	0.1504	
30 minute winter	MH3	4.000	MH4	4.7	0.772	0.266	0.0477	
15 minute winter	MH4	3.001	MH5	8.4	1.070	1.200	0.1707	
15 minute winter	MH5	1.003	MH6-OF	26.2	3.349	2.536	0.0487	36.4

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	IS1	100	64.210	0.600	11.3	2.8788	38.8735	FLOOD
60 minute winter	OU	23	64.310	0.700	24.3	1.6310	24.6315	FLOOD
15 minute summer	JUN	8	64.310	1.092	39.3	3.1039	0.0000	FLOOD RISK
30 minute winter	MH7	13	64.290	1.180	42.8	3.8893	18.6544	FLOOD
60 minute winter	MH3	28	64.240	0.770	13.8	2.0705	10.2711	FLOOD
15 minute winter	MH4	9	64.250	1.280	22.4	2.6470	4.0610	FLOOD
15 minute winter	MH5	11	64.217	1.537	33.2	2.8985	0.0000	FLOOD RISK
120 minute summer	MH6-OF	126	62.600	0.100	24.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	IS1	1.000	JUN	3.4	0.481	0.514	0.2534	
60 minute winter	OU	2.000	JUN	-9.4	-1.206	-0.505	0.0327	
15 minute summer	JUN	1.001	MH7	12.8	1.638	1.928	0.0699	
30 minute winter	MH7	1.002	MH5	10.6	1.351	1.165	0.1504	
60 minute winter	MH3	4.000	MH4	4.4	0.724	0.251	0.0477	
15 minute winter	MH4	3.001	MH5	8.4	1.072	1.203	0.1707	
15 minute winter	MH5	1.003	MH6-OF	27.2	3.481	2.637	0.0486	38.2

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
OU	0.067	5.00	64.350	450	388197.648	396937.189	0.700
OF			64.320	1200	388195.457	396937.434	5.120

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	OU	OF	2.205	0.600	63.650	59.200	4.450	0.5	100	5.00	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	1 year 180 minute winter	12.527	4.959
1 year 15 minute winter	64.927	26.180	1 year 240 minute summer	15.301	4.043
1 year 30 minute summer	60.022	16.984	1 year 240 minute winter	10.165	4.043
1 year 30 minute winter	42.121	16.984	1 year 360 minute summer	11.775	3.030
1 year 60 minute summer	40.398	10.676	1 year 360 minute winter	7.654	3.030
1 year 60 minute winter	26.839	10.676	1 year 480 minute summer	9.342	2.469
1 year 120 minute summer	24.980	6.602	1 year 480 minute winter	6.207	2.469
1 year 120 minute winter	16.596	6.602	1 year 600 minute summer	7.682	2.101
1 year 180 minute summer	19.271	4.959	1 year 600 minute winter	5.249	2.101

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 720 minute summer	6.859	1.838	30 year 960 minute winter	8.133	3.233
1 year 720 minute winter	4.609	1.838	30 year 1440 minute summer	8.788	2.355
1 year 960 minute summer	5.653	1.489	30 year 1440 minute winter	5.906	2.355
1 year 960 minute winter	3.745	1.489	100 year 15 minute summer	291.766	82.560
1 year 1440 minute summer	4.127	1.106	100 year 15 minute winter	204.748	82.560
1 year 1440 minute winter	2.773	1.106	100 year 30 minute summer	191.982	54.324
30 year 15 minute summer	226.195	64.005	100 year 30 minute winter	134.724	54.324
30 year 15 minute winter	158.733	64.005	100 year 60 minute summer	129.253	34.158
30 year 30 minute summer	147.452	41.724	100 year 60 minute winter	85.873	34.158
30 year 30 minute winter	103.475	41.724	100 year 120 minute summer	78.836	20.834
30 year 60 minute summer	98.615	26.061	100 year 120 minute winter	52.377	20.834
30 year 60 minute winter	65.517	26.061	100 year 180 minute summer	59.966	15.431
30 year 120 minute summer	59.946	15.842	100 year 180 minute winter	38.980	15.431
30 year 120 minute winter	39.827	15.842	100 year 240 minute summer	46.975	12.414
30 year 180 minute summer	45.598	11.734	100 year 240 minute winter	31.209	12.414
30 year 180 minute winter	29.640	11.734	100 year 360 minute summer	35.264	9.075
30 year 240 minute summer	35.759	9.450	100 year 360 minute winter	22.923	9.075
30 year 240 minute winter	23.758	9.450	100 year 480 minute summer	27.350	7.228
30 year 360 minute summer	26.939	6.932	100 year 480 minute winter	18.171	7.228
30 year 360 minute winter	17.511	6.932	100 year 600 minute summer	22.137	6.055
30 year 480 minute summer	20.981	5.545	100 year 600 minute winter	15.126	6.055
30 year 480 minute winter	13.940	5.545	100 year 720 minute summer	19.562	5.243
30 year 600 minute summer	17.039	4.661	100 year 720 minute winter	13.147	5.243
30 year 600 minute winter	11.642	4.661	100 year 960 minute summer	15.851	4.174
30 year 720 minute summer	15.093	4.045	100 year 960 minute winter	10.500	4.174
30 year 720 minute winter	10.143	4.045	100 year 1440 minute summer	11.278	3.023
30 year 960 minute summer	12.278	3.233	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 93.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.672	0.022	8.0	0.0462	0.0000	OK
15 minute winter	OF	10	59.221	0.021	8.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	8.0	6.497	0.092	0.0027	3.7

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Results for 30 year Critical Storm Duration. Lowest mass balance: 93.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.687	0.037	19.5	0.0768	0.0000	OK
15 minute winter	OF	10	59.232	0.032	19.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	19.5	8.075	0.223	0.0053	9.0

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Results for 100 year Critical Storm Duration. Lowest mass balance: 93.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.693	0.043	25.2	0.0900	0.0000	OK
15 minute winter	OF	10	59.237	0.037	25.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	25.1	8.541	0.289	0.0065	11.6

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
OU	0.164	5.00	64.430	405	388235.250	396926.712	0.700
OF			64.520	1200	388234.428	396913.492	1.150

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	OU	OF	13.246	0.600	63.730	63.370	0.360	36.8	150	5.10	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	1 year 180 minute winter	12.527	4.959
1 year 15 minute winter	64.927	26.180	1 year 240 minute summer	15.301	4.043
1 year 30 minute summer	60.022	16.984	1 year 240 minute winter	10.165	4.043
1 year 30 minute winter	42.121	16.984	1 year 360 minute summer	11.775	3.030
1 year 60 minute summer	40.398	10.676	1 year 360 minute winter	7.654	3.030
1 year 60 minute winter	26.839	10.676	1 year 480 minute summer	9.342	2.469
1 year 120 minute summer	24.980	6.602	1 year 480 minute winter	6.207	2.469
1 year 120 minute winter	16.596	6.602	1 year 600 minute summer	7.682	2.101
1 year 180 minute summer	19.271	4.959	1 year 600 minute winter	5.249	2.101

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 720 minute summer	6.859	1.838
1 year 720 minute winter	4.609	1.838
1 year 960 minute summer	5.653	1.489
1 year 960 minute winter	3.745	1.489
1 year 1440 minute summer	4.127	1.106
1 year 1440 minute winter	2.773	1.106
30 year 15 minute summer	226.195	64.005
30 year 15 minute winter	158.733	64.005
30 year 30 minute summer	147.452	41.724
30 year 30 minute winter	103.475	41.724
30 year 60 minute summer	98.615	26.061
30 year 60 minute winter	65.517	26.061
30 year 120 minute summer	59.946	15.842
30 year 120 minute winter	39.827	15.842
30 year 180 minute summer	45.598	11.734
30 year 180 minute winter	29.640	11.734
30 year 240 minute summer	35.759	9.450
30 year 240 minute winter	23.758	9.450
30 year 360 minute summer	26.939	6.932
30 year 360 minute winter	17.511	6.932
30 year 480 minute summer	20.981	5.545
30 year 480 minute winter	13.940	5.545
30 year 600 minute summer	17.039	4.661
30 year 600 minute winter	11.642	4.661
30 year 720 minute summer	15.093	4.045
30 year 720 minute winter	10.143	4.045
30 year 960 minute summer	12.278	3.233
30 year 960 minute winter	8.133	3.233
30 year 1440 minute summer	8.788	2.355
30 year 1440 minute winter	5.906	2.355
100 year 15 minute summer	291.766	82.560
100 year 15 minute winter	204.748	82.560
100 year 30 minute summer	191.982	54.324
100 year 30 minute winter	134.724	54.324
100 year 60 minute summer	129.253	34.158
100 year 60 minute winter	85.873	34.158
100 year 120 minute summer	78.836	20.834
100 year 120 minute winter	52.377	20.834
100 year 180 minute summer	59.966	15.431
100 year 180 minute winter	38.980	15.431
100 year 240 minute summer	46.975	12.414
100 year 240 minute winter	31.209	12.414
100 year 360 minute summer	35.264	9.075
100 year 360 minute winter	22.923	9.075
100 year 480 minute summer	27.350	7.228
100 year 480 minute winter	18.171	7.228
100 year 600 minute summer	22.137	6.055
100 year 600 minute winter	15.126	6.055
100 year 720 minute summer	19.562	5.243
100 year 720 minute winter	13.147	5.243
100 year 960 minute summer	15.851	4.174
100 year 960 minute winter	10.500	4.174
100 year 1440 minute summer	11.278	3.023
100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.826	0.096	19.5	0.4599	0.0000	OK
15 minute winter	OF	10	63.458	0.088	19.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	19.1	1.694	0.650	0.1495	9.0

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	12	64.322	0.592	47.6	2.8490	0.0000	FLOOD RISK
30 minute winter	OF	22	63.522	0.152	33.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	39.7	2.258	1.351	0.2308	21.9

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	64.430	0.700	61.5	3.3691	2.4406	FLOOD
15 minute summer	OF	8	63.522	0.152	42.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	OF	42.3	2.402	1.438	0.2315	26.3

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.040	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
END	0.118	5.00	64.300		388247.767	396877.147	0.750
MH2	0.117	5.00	64.540	1200	388256.044	396906.014	1.050
MH1-OF			64.520	1200	388234.503	396913.381	1.150

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	END	MH2	30.034	0.600	63.550	63.490	0.060	500.6	150	5.41	39.6
1.001	MH2	MH1-OF	22.766	0.600	63.490	63.370	0.120	189.7	150	5.81	39.4

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.040	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	44.998	12.733	1 year 120 minute winter	26.264	10.447
1 year 15 minute winter	31.578	12.733	1 year 180 minute summer	39.584	10.186
1 year 30 minute summer	40.530	11.469	1 year 180 minute winter	25.731	10.186
1 year 30 minute winter	28.442	11.469	1 year 240 minute summer	38.023	10.048
1 year 60 minute summer	40.398	10.676	1 year 240 minute winter	25.261	10.048
1 year 60 minute winter	26.839	10.676	1 year 360 minute summer	38.394	9.880
1 year 120 minute summer	39.532	10.447	1 year 360 minute winter	24.957	9.880

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 480 minute summer	36.565	9.663
1 year 480 minute winter	24.293	9.663
1 year 600 minute summer	34.156	9.343
1 year 600 minute winter	23.338	9.343
1 year 720 minute summer	33.887	9.082
1 year 720 minute winter	22.774	9.082
1 year 960 minute summer	32.984	8.685
1 year 960 minute winter	21.849	8.685
1 year 1440 minute summer	30.427	8.155
1 year 1440 minute winter	20.449	8.155
30 year 15 minute summer	103.666	29.334
30 year 15 minute winter	72.748	29.334
30 year 30 minute summer	98.135	27.769
30 year 30 minute winter	68.867	27.769
30 year 60 minute summer	98.615	26.061
30 year 60 minute winter	65.517	26.061
30 year 120 minute summer	87.761	23.193
30 year 120 minute winter	58.306	23.193
30 year 180 minute summer	81.976	21.095
30 year 180 minute winter	53.287	21.095
30 year 240 minute summer	74.148	19.595
30 year 240 minute winter	49.262	19.595
30 year 360 minute summer	67.995	17.497
30 year 360 minute winter	44.198	17.497
30 year 480 minute summer	61.172	16.166
30 year 480 minute winter	40.641	16.166
30 year 600 minute summer	55.787	15.259
30 year 600 minute winter	38.117	15.259
30 year 720 minute summer	54.635	14.643
30 year 720 minute winter	36.718	14.643
30 year 960 minute summer	52.567	13.842
30 year 960 minute winter	34.821	13.842
30 year 1440 minute summer	47.529	12.738
30 year 1440 minute winter	31.942	12.738
100 year 15 minute summer	129.887	36.754
100 year 15 minute winter	91.149	36.754
100 year 30 minute summer	125.789	35.594
100 year 30 minute winter	88.273	35.594
100 year 60 minute summer	129.253	34.158
100 year 60 minute winter	85.873	34.158
100 year 120 minute summer	114.053	30.141
100 year 120 minute winter	75.774	30.141
100 year 180 minute summer	104.318	26.844
100 year 180 minute winter	67.809	26.844
100 year 240 minute summer	92.595	24.470
100 year 240 minute winter	61.518	24.470
100 year 360 minute summer	82.221	21.158
100 year 360 minute winter	53.446	21.158
100 year 480 minute summer	72.363	19.123
100 year 480 minute winter	48.076	19.123
100 year 600 minute summer	65.032	17.788
100 year 600 minute winter	44.434	17.788
100 year 720 minute summer	63.169	16.930
100 year 720 minute winter	42.453	16.930
100 year 960 minute summer	60.333	15.887
100 year 960 minute winter	39.966	15.887
100 year 1440 minute summer	53.862	14.436
100 year 1440 minute winter	36.199	14.436

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	END	248	63.822	0.272	9.0	0.8573	0.0000	SURCHARGED
480 minute summer	MH2	248	63.737	0.247	17.8	0.8310	0.0000	SURCHARGED
480 minute summer	MH1-OF	248	63.493	0.123	17.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	END	1.000	MH2	8.9	0.508	1.143	0.5287	
480 minute summer	MH2	1.001	MH1-OF	17.8	1.024	1.386	0.3762	136.0

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	END	19	64.300	0.750	19.5	2.5815	0.0000	FLOOD RISK
120 minute summer	MH2	66	64.507	1.017	36.8	3.4170	0.0000	FLOOD RISK
30 minute summer	MH1-OF	20	63.512	0.142	28.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	END	1.000	MH2	14.0	0.794	1.788	0.5287	
120 minute summer	MH2	1.001	MH1-OF	34.9	1.980	2.717	0.3967	81.6

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	END	12	64.300	0.750	19.7	2.4218	0.0000	FLOOD RISK
120 minute summer	MH2	62	64.540	1.050	50.9	3.5280	6.5771	FLOOD
30 minute summer	MH1-OF	18	63.512	0.142	34.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	END	1.000	MH2	13.7	0.777	1.750	0.5287	
120 minute summer	MH2	1.001	MH1-OF	35.4	2.014	2.763	0.3967	99.5

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MH15	0.039	5.00	64.500	1200	388151.340	396878.825	0.360
MH16	0.039	5.00	64.430	1200	388162.735	396862.174	0.720
MH17	0.038	5.00	64.400	1200	388164.393	396853.306	0.800
MH18	0.038	5.00	64.470	1200	388174.551	396847.468	1.000
MH19	0.038	5.00	64.400	1200	388192.986	396842.927	1.060
MH28	0.038	5.00	64.410	1200	388202.599	396841.174	1.420
MH26	0.038	5.00	64.420	1200	388207.230	396859.924	1.710
MH27	0.038	5.00	64.150	1200	388221.754	396865.013	1.936
MH1			64.520	1200	388234.313	396913.353	3.917

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	MH15	MH16	20.177	0.600	64.140	63.710	0.430	46.9	100	5.30	50.0
1.001	MH16	MH17	9.056	0.600	63.710	63.600	0.110	82.3	100	5.48	50.0
1.002	MH17	MH18	11.716	0.600	63.600	63.470	0.130	90.1	100	5.72	50.0
1.003	MH18	MH19	18.986	0.600	63.470	63.340	0.130	146.0	100	6.22	50.0
1.004	MH19	MH28	9.772	0.600	63.340	63.065	0.275	35.5	100	6.34	50.0
1.005	MH28	MH26	19.313	0.600	62.990	62.710	0.280	69.0	150	6.61	50.0
1.006	MH26	MH27	15.390	0.600	62.710	62.214	0.496	31.0	150	6.75	50.0
1.007	MH27	MH1	49.945	0.600	62.214	60.603	1.611	31.0	150	7.21	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year 15 minute summer	291.766	82.560
1 year 360 minute winter	7.654	3.030	100 year 15 minute winter	204.748	82.560
1 year 480 minute summer	9.342	2.469	100 year 30 minute summer	191.982	54.324
1 year 480 minute winter	6.207	2.469	100 year 30 minute winter	134.724	54.324
1 year 600 minute summer	7.682	2.101	100 year 60 minute summer	129.253	34.158
1 year 600 minute winter	5.249	2.101	100 year 60 minute winter	85.873	34.158
1 year 720 minute summer	6.859	1.838	100 year 120 minute summer	78.836	20.834
1 year 720 minute winter	4.609	1.838	100 year 120 minute winter	52.377	20.834
1 year 960 minute summer	5.653	1.489	100 year 180 minute summer	59.966	15.431
1 year 960 minute winter	3.745	1.489	100 year 180 minute winter	38.980	15.431
1 year 1440 minute summer	4.127	1.106	100 year 240 minute summer	46.975	12.414
1 year 1440 minute winter	2.773	1.106	100 year 240 minute winter	31.209	12.414
30 year 15 minute summer	226.195	64.005	100 year 360 minute summer	35.264	9.075
30 year 15 minute winter	158.733	64.005	100 year 360 minute winter	22.923	9.075
30 year 30 minute summer	147.452	41.724	100 year 480 minute summer	27.350	7.228
30 year 30 minute winter	103.475	41.724	100 year 480 minute winter	18.171	7.228
30 year 60 minute summer	98.615	26.061	100 year 600 minute summer	22.137	6.055
30 year 60 minute winter	65.517	26.061	100 year 600 minute winter	15.126	6.055
30 year 120 minute summer	59.946	15.842	100 year 720 minute summer	19.562	5.243
30 year 120 minute winter	39.827	15.842	100 year 720 minute winter	13.147	5.243
30 year 180 minute summer	45.598	11.734	100 year 960 minute summer	15.851	4.174
30 year 180 minute winter	29.640	11.734	100 year 960 minute winter	10.500	4.174
30 year 240 minute summer	35.759	9.450	100 year 1440 minute summer	11.278	3.023
30 year 240 minute winter	23.758	9.450	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH15	14	64.205	0.065	4.6	0.2152	0.0000	OK
15 minute winter	MH16	14	64.185	0.475	9.1	1.0507	0.0000	FLOOD RISK
15 minute winter	MH17	14	64.130	0.530	8.9	1.1027	0.0000	FLOOD RISK
15 minute winter	MH18	14	63.976	0.506	10.0	0.9572	0.0000	SURCHARGED
15 minute winter	MH19	13	63.556	0.216	11.9	0.3990	0.0000	SURCHARGED
15 minute winter	MH28	11	63.088	0.098	15.0	0.1633	0.0000	OK
15 minute winter	MH26	11	62.797	0.087	19.2	0.1372	0.0000	OK
15 minute winter	MH27	11	62.312	0.098	23.5	0.1493	0.0000	OK
15 minute winter	MH1	11	60.698	0.095	23.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH15	1.000	MH16	4.5	0.665	0.505	0.1335	
15 minute winter	MH16	1.001	MH17	4.7	0.723	0.706	0.0709	
15 minute winter	MH17	1.002	MH18	6.5	0.831	1.022	0.0917	
15 minute winter	MH18	1.003	MH19	8.5	1.089	1.711	0.1486	
15 minute winter	MH19	1.004	MH28	11.2	1.429	1.097	0.0764	
15 minute winter	MH28	1.005	MH26	14.9	1.324	0.697	0.2201	
15 minute winter	MH26	1.006	MH27	19.2	1.686	0.599	0.1753	
15 minute winter	MH27	1.007	MH1	23.5	1.959	0.733	0.5992	16.8

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	MH15	17	64.500	0.360	8.7	1.1873	1.5443	FLOOD
60 minute winter	MH16	32	64.430	0.720	9.1	1.5941	3.6785	FLOOD
15 minute winter	MH17	10	64.400	0.800	16.6	1.6648	3.8411	FLOOD
15 minute winter	MH18	11	64.437	0.967	16.2	1.8278	0.0000	FLOOD RISK
15 minute winter	MH19	12	64.209	0.869	19.8	1.6056	0.0000	FLOOD RISK
15 minute winter	MH28	13	63.626	0.636	24.7	1.0594	0.0000	SURCHARGED
15 minute winter	MH26	13	63.313	0.603	30.5	0.9497	0.0000	SURCHARGED
15 minute winter	MH27	12	62.845	0.631	37.2	0.9624	0.0000	SURCHARGED
30 minute winter	MH1	17	60.755	0.152	33.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	MH15	1.000	MH16	4.7	0.696	0.535	0.1579	
60 minute winter	MH16	1.001	MH17	5.0	0.686	0.749	0.0709	
15 minute winter	MH17	1.002	MH18	7.1	0.908	1.116	0.0917	
15 minute winter	MH18	1.003	MH19	9.4	1.197	1.880	0.1486	
15 minute winter	MH19	1.004	MH28	14.1	1.804	1.385	0.0765	
15 minute winter	MH28	1.005	MH26	20.6	1.405	0.963	0.3400	
15 minute winter	MH26	1.006	MH27	27.9	1.735	0.870	0.2709	
15 minute winter	MH27	1.007	MH1	35.3	2.003	1.100	0.8792	32.8

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	MH15	16	64.500	0.360	11.4	1.1873	2.9358	FLOOD
60 minute winter	MH16	29	64.430	0.720	10.9	1.5941	6.2415	FLOOD
30 minute winter	MH17	15	64.400	0.800	18.3	1.6648	8.6590	FLOOD
15 minute winter	MH18	10	64.470	1.000	16.8	1.8910	0.7907	FLOOD
15 minute winter	MH19	11	64.400	1.060	21.9	1.9589	0.5671	FLOOD
15 minute winter	MH28	13	64.039	1.049	27.6	1.7480	0.0000	SURCHARGED
15 minute winter	MH26	13	63.751	1.041	34.1	1.6397	0.0000	SURCHARGED
15 minute winter	MH27	13	63.238	1.024	41.7	1.5599	0.0000	SURCHARGED
60 minute winter	MH1	32	60.755	0.152	33.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	MH15	1.000	MH16	4.6	0.672	0.521	0.1579	
60 minute winter	MH16	1.001	MH17	4.9	0.681	0.741	0.0709	
30 minute winter	MH17	1.002	MH18	7.2	0.919	1.130	0.0917	
15 minute winter	MH18	1.003	MH19	9.2	1.179	1.853	0.1486	
15 minute winter	MH19	1.004	MH28	13.9	1.772	1.360	0.0765	
15 minute winter	MH28	1.005	MH26	20.7	1.403	0.967	0.3400	
15 minute winter	MH26	1.006	MH27	29.1	1.727	0.907	0.2709	
15 minute winter	MH27	1.007	MH1	38.4	2.184	1.199	0.8793	37.7

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
OU	0.028	5.00	64.180	450	388278.514	396865.534	0.700
UU2802			64.040	1200	388274.411	396862.258	1.085

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	OU	UU2802	5.250	0.600	63.480	62.955	0.525	10.0	150	5.03	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	1 year 180 minute winter	12.527	4.959
1 year 15 minute winter	64.927	26.180	1 year 240 minute summer	15.301	4.043
1 year 30 minute summer	60.022	16.984	1 year 240 minute winter	10.165	4.043
1 year 30 minute winter	42.121	16.984	1 year 360 minute summer	11.775	3.030
1 year 60 minute summer	40.398	10.676	1 year 360 minute winter	7.654	3.030
1 year 60 minute winter	26.839	10.676	1 year 480 minute summer	9.342	2.469
1 year 120 minute summer	24.980	6.602	1 year 480 minute winter	6.207	2.469
1 year 120 minute winter	16.596	6.602	1 year 600 minute summer	7.682	2.101
1 year 180 minute summer	19.271	4.959	1 year 600 minute winter	5.249	2.101

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 720 minute summer	6.859	1.838
1 year 720 minute winter	4.609	1.838
1 year 960 minute summer	5.653	1.489
1 year 960 minute winter	3.745	1.489
1 year 1440 minute summer	4.127	1.106
1 year 1440 minute winter	2.773	1.106
30 year 15 minute summer	226.195	64.005
30 year 15 minute winter	158.733	64.005
30 year 30 minute summer	147.452	41.724
30 year 30 minute winter	103.475	41.724
30 year 60 minute summer	98.615	26.061
30 year 60 minute winter	65.517	26.061
30 year 120 minute summer	59.946	15.842
30 year 120 minute winter	39.827	15.842
30 year 180 minute summer	45.598	11.734
30 year 180 minute winter	29.640	11.734
30 year 240 minute summer	35.759	9.450
30 year 240 minute winter	23.758	9.450
30 year 360 minute summer	26.939	6.932
30 year 360 minute winter	17.511	6.932
30 year 480 minute summer	20.981	5.545
30 year 480 minute winter	13.940	5.545
30 year 600 minute summer	17.039	4.661
30 year 600 minute winter	11.642	4.661
30 year 720 minute summer	15.093	4.045
30 year 720 minute winter	10.143	4.045
30 year 960 minute summer	12.278	3.233
30 year 960 minute winter	8.133	3.233
30 year 1440 minute summer	8.788	2.355
30 year 1440 minute winter	5.906	2.355
100 year 15 minute summer	291.766	82.560
100 year 15 minute winter	204.748	82.560
100 year 30 minute summer	191.982	54.324
100 year 30 minute winter	134.724	54.324
100 year 60 minute summer	129.253	34.158
100 year 60 minute winter	85.873	34.158
100 year 120 minute summer	78.836	20.834
100 year 120 minute winter	52.377	20.834
100 year 180 minute summer	59.966	15.431
100 year 180 minute winter	38.980	15.431
100 year 240 minute summer	46.975	12.414
100 year 240 minute winter	31.209	12.414
100 year 360 minute summer	35.264	9.075
100 year 360 minute winter	22.923	9.075
100 year 480 minute summer	27.350	7.228
100 year 480 minute winter	18.171	7.228
100 year 600 minute summer	22.137	6.055
100 year 600 minute winter	15.126	6.055
100 year 720 minute summer	19.562	5.243
100 year 720 minute winter	13.147	5.243
100 year 960 minute summer	15.851	4.174
100 year 960 minute winter	10.500	4.174
100 year 1440 minute summer	11.278	3.023
100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.506	0.026	3.3	0.0245	0.0000	OK
15 minute winter	UU2802	10	62.980	0.025	3.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	UU2802	3.3	1.694	0.058	0.0102	1.5

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.521	0.041	8.1	0.0393	0.0000	OK
15 minute winter	UU2802	10	62.993	0.038	8.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	UU2802	8.1	2.160	0.142	0.0196	3.7

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	OU	10	63.527	0.047	10.4	0.0452	0.0000	OK
15 minute winter	UU2802	10	62.999	0.044	10.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	OU	1.000	UU2802	10.4	2.302	0.183	0.0237	4.8

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MH BS1	0.012	5.00	64.180	450	388220.099	396859.542	0.600
MH BS2	0.012	5.00	64.200	1200	388226.987	396858.682	0.620
MH-BS3	0.012	5.00	64.260	1200	388236.550	396856.147	0.860
MH24	0.012	5.00	64.240	1200	388230.400	396833.577	1.400
MH25	0.012	5.00	64.200	1200	388233.417	396850.140	1.854
MH-BS4	0.012	5.00	64.280	1200	388237.274	396848.981	2.150
UU2801			64.070	1200	388247.144	396845.498	1.960

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	MH BS1	MH BS2	6.941	0.600	63.580	63.580	0.000	0.0	100	5.12	50.0
1.001	MH BS2	MH-BS3	9.896	0.600	63.580	63.400	0.180	55.0	100	5.27	50.0
1.002	MH-BS3	MH-BS4	7.202	0.600	63.400	62.255	1.145	6.3	100	5.31	50.0
2.000	MH24	MH25	16.836	0.600	62.840	62.346	0.494	34.1	100	5.21	50.0
2.001	MH25	MH-BS4	4.027	0.600	62.346	62.228	0.118	34.1	100	5.26	50.0
1.003	MH-BS4	UU2801	10.467	0.600	62.130	62.110	0.020	523.3	225	5.62	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year 15 minute summer	291.766	82.560
1 year 360 minute winter	7.654	3.030	100 year 15 minute winter	204.748	82.560
1 year 480 minute summer	9.342	2.469	100 year 30 minute summer	191.982	54.324
1 year 480 minute winter	6.207	2.469	100 year 30 minute winter	134.724	54.324
1 year 600 minute summer	7.682	2.101	100 year 60 minute summer	129.253	34.158
1 year 600 minute winter	5.249	2.101	100 year 60 minute winter	85.873	34.158
1 year 720 minute summer	6.859	1.838	100 year 120 minute summer	78.836	20.834
1 year 720 minute winter	4.609	1.838	100 year 120 minute winter	52.377	20.834
1 year 960 minute summer	5.653	1.489	100 year 180 minute summer	59.966	15.431
1 year 960 minute winter	3.745	1.489	100 year 180 minute winter	38.980	15.431
1 year 1440 minute summer	4.127	1.106	100 year 240 minute summer	46.975	12.414
1 year 1440 minute winter	2.773	1.106	100 year 240 minute winter	31.209	12.414
30 year 15 minute summer	226.195	64.005	100 year 360 minute summer	35.264	9.075
30 year 15 minute winter	158.733	64.005	100 year 360 minute winter	22.923	9.075
30 year 30 minute summer	147.452	41.724	100 year 480 minute summer	27.350	7.228
30 year 30 minute winter	103.475	41.724	100 year 480 minute winter	18.171	7.228
30 year 60 minute summer	98.615	26.061	100 year 600 minute summer	22.137	6.055
30 year 60 minute winter	65.517	26.061	100 year 600 minute winter	15.126	6.055
30 year 120 minute summer	59.946	15.842	100 year 720 minute summer	19.562	5.243
30 year 120 minute winter	39.827	15.842	100 year 720 minute winter	13.147	5.243
30 year 180 minute summer	45.598	11.734	100 year 960 minute summer	15.851	4.174
30 year 180 minute winter	29.640	11.734	100 year 960 minute winter	10.500	4.174
30 year 240 minute summer	35.759	9.450	100 year 1440 minute summer	11.278	3.023
30 year 240 minute winter	23.758	9.450	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH BS1	10	63.642	0.062	1.4	0.0347	0.0000	OK
15 minute winter	MH BS2	11	63.623	0.043	2.7	0.0650	0.0000	OK
15 minute winter	MH-BS3	11	63.429	0.029	4.1	0.0403	0.0000	OK
15 minute winter	MH24	10	62.865	0.025	1.4	0.0320	0.0000	OK
15 minute winter	MH25	10	62.384	0.038	2.8	0.0474	0.0000	OK
15 minute winter	MH-BS4	11	62.222	0.092	8.1	0.1143	0.0000	OK
15 minute winter	UU2801	11	62.183	0.073	8.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH BS1	1.000	MH BS2	1.3	0.323	0.171	0.0288	
15 minute winter	MH BS2	1.001	MH-BS3	2.7	1.070	0.328	0.0250	
15 minute winter	MH-BS3	1.002	MH-BS4	4.0	2.234	0.165	0.0129	
15 minute winter	MH24	2.000	MH25	1.4	0.660	0.131	0.0352	
15 minute winter	MH25	2.001	MH-BS4	2.7	1.056	0.259	0.0103	
15 minute winter	MH-BS4	1.003	UU2801	8.1	0.613	0.360	0.1383	3.9

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH BS1	10	63.686	0.106	3.5	0.0591	0.0000	SURCHARGED
15 minute winter	MH BS2	11	63.658	0.078	6.9	0.1179	0.0000	OK
15 minute winter	MH-BS3	10	63.448	0.048	10.2	0.0681	0.0000	OK
15 minute winter	MH24	10	62.880	0.040	3.5	0.0518	0.0000	OK
15 minute winter	MH25	10	62.414	0.068	7.0	0.0854	0.0000	OK
15 minute winter	MH-BS4	10	62.283	0.153	20.5	0.1904	0.0000	OK
15 minute winter	UU2801	11	62.228	0.118	20.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH BS1	1.000	MH BS2	3.4	0.452	0.432	0.0498	
15 minute winter	MH BS2	1.001	MH-BS3	6.8	1.304	0.827	0.0508	
15 minute winter	MH-BS3	1.002	MH-BS4	10.1	2.832	0.416	0.0258	
15 minute winter	MH24	2.000	MH25	3.5	0.806	0.332	0.0719	
15 minute winter	MH25	2.001	MH-BS4	6.8	1.302	0.655	0.0211	
15 minute winter	MH-BS4	1.003	UU2801	20.3	0.814	0.906	0.2610	9.6

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH BS1	11	63.742	0.162	4.5	0.0903	0.0000	SURCHARGED
15 minute winter	MH BS2	11	63.701	0.121	8.6	0.1844	0.0000	SURCHARGED
15 minute winter	MH-BS3	10	63.455	0.055	12.2	0.0769	0.0000	OK
15 minute winter	MH24	10	62.886	0.046	4.5	0.0595	0.0000	OK
15 minute winter	MH25	10	62.430	0.084	8.9	0.1057	0.0000	OK
15 minute winter	MH-BS4	10	62.306	0.176	25.6	0.2193	0.0000	OK
15 minute winter	UU2801	10	62.243	0.133	25.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH BS1	1.000	MH BS2	4.1	0.525	0.523	0.0543	
15 minute winter	MH BS2	1.001	MH-BS3	7.9	1.348	0.970	0.0603	
15 minute winter	MH-BS3	1.002	MH-BS4	12.4	2.951	0.509	0.0303	
15 minute winter	MH24	2.000	MH25	4.4	0.833	0.426	0.0884	
15 minute winter	MH25	2.001	MH-BS4	8.7	1.303	0.836	0.0274	
15 minute winter	MH-BS4	1.003	UU2801	25.4	0.873	1.131	0.3025	12.4

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MH31	0.042	5.00	64.370	1200	388188.463	396828.530	0.980
MH32	0.042	5.00	64.290	1200	388181.042	396802.263	1.150
MH33	0.042	5.00	64.260	1200	388191.420	396798.934	1.191
MH34	0.042	5.00	64.180	1200	388207.113	396793.500	1.219
MH38	0.042	5.00	64.260	1200	388224.169	396810.152	0.910
MH37	0.042	5.00	64.240	1200	388220.838	396797.106	1.150
MH36	0.042	5.00	64.190	1200	388220.780	396795.280	1.210
FW1B	0.042	5.00	64.230	1200	388221.021	396783.307	2.600
UU2708			64.040	1200	388228.769	396779.732	4.205

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	MH31	MH32	27.295	0.600	63.390	63.140	0.250	109.2	150	5.47	50.0
1.001	MH32	MH33	10.899	0.600	63.140	63.069	0.071	153.9	150	5.70	50.0
1.002	MH33	MH34	16.607	0.600	63.069	62.961	0.108	153.8	150	5.96	50.0
1.003	MH34	FW1B	17.243	0.600	62.961	62.480	0.481	35.8	225	6.09	50.0
1.004	MH38	MH37	7.998	0.600	63.350	63.090	0.260	30.8	100	5.49	50.0
2.001	MH37	MH36	1.827	0.600	63.090	63.050	0.040	45.7	150	5.51	50.0
1.005	MH36	FW1B	27.504	0.600	62.980	61.630	1.350	20.4	150	5.81	50.0
1.004_1	FW1B	UU2708	8.533	0.600	61.630	59.835	1.795	4.8	225	6.11	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year 15 minute summer	291.766	82.560
1 year 360 minute winter	7.654	3.030	100 year 15 minute winter	204.748	82.560
1 year 480 minute summer	9.342	2.469	100 year 30 minute summer	191.982	54.324
1 year 480 minute winter	6.207	2.469	100 year 30 minute winter	134.724	54.324
1 year 600 minute summer	7.682	2.101	100 year 60 minute summer	129.253	34.158
1 year 600 minute winter	5.249	2.101	100 year 60 minute winter	85.873	34.158
1 year 720 minute summer	6.859	1.838	100 year 120 minute summer	78.836	20.834
1 year 720 minute winter	4.609	1.838	100 year 120 minute winter	52.377	20.834
1 year 960 minute summer	5.653	1.489	100 year 180 minute summer	59.966	15.431
1 year 960 minute winter	3.745	1.489	100 year 180 minute winter	38.980	15.431
1 year 1440 minute summer	4.127	1.106	100 year 240 minute summer	46.975	12.414
1 year 1440 minute winter	2.773	1.106	100 year 240 minute winter	31.209	12.414
30 year 15 minute summer	226.195	64.005	100 year 360 minute summer	35.264	9.075
30 year 15 minute winter	158.733	64.005	100 year 360 minute winter	22.923	9.075
30 year 30 minute summer	147.452	41.724	100 year 480 minute summer	27.350	7.228
30 year 30 minute winter	103.475	41.724	100 year 480 minute winter	18.171	7.228
30 year 60 minute summer	98.615	26.061	100 year 600 minute summer	22.137	6.055
30 year 60 minute winter	65.517	26.061	100 year 600 minute winter	15.126	6.055
30 year 120 minute summer	59.946	15.842	100 year 720 minute summer	19.562	5.243
30 year 120 minute winter	39.827	15.842	100 year 720 minute winter	13.147	5.243
30 year 180 minute summer	45.598	11.734	100 year 960 minute summer	15.851	4.174
30 year 180 minute winter	29.640	11.734	100 year 960 minute winter	10.500	4.174
30 year 240 minute summer	35.759	9.450	100 year 1440 minute summer	11.278	3.023
30 year 240 minute winter	23.758	9.450	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH31	10	63.445	0.055	5.0	0.1089	0.0000	OK
15 minute winter	MH32	11	63.239	0.099	9.9	0.1845	0.0000	OK
15 minute winter	MH33	11	63.195	0.126	14.3	0.2311	0.0000	OK
15 minute winter	MH34	11	63.036	0.075	19.0	0.1360	0.0000	OK
15 minute winter	MH38	10	63.397	0.047	5.0	0.0968	0.0000	OK
15 minute winter	MH37	10	63.168	0.078	9.9	0.1455	0.0000	OK
15 minute winter	MH36	10	63.045	0.065	14.8	0.1180	0.0000	OK
15 minute winter	FW1B	11	61.696	0.066	38.2	0.0958	0.0000	OK
15 minute winter	UU2708	11	59.895	0.060	38.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH31	1.000	MH32	4.9	0.549	0.286	0.2472	
15 minute winter	MH32	1.001	MH33	9.6	0.677	0.673	0.1533	
15 minute winter	MH33	1.002	MH34	14.3	1.146	1.004	0.2038	
15 minute winter	MH34	1.003	FW1B	19.1	1.712	0.219	0.1920	
15 minute winter	MH38	1.004	MH37	4.9	0.956	0.450	0.0408	
15 minute winter	MH37	2.001	MH36	9.8	1.201	0.372	0.0149	
15 minute winter	MH36	1.005	FW1B	14.7	2.006	0.370	0.2011	
15 minute winter	FW1B	1.004_1	UU2708	38.3	4.211	0.159	0.0776	18.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH31	12	63.824	0.434	12.2	0.8627	0.0000	SURCHARGED
15 minute winter	MH32	12	63.741	0.601	19.9	1.1185	0.0000	SURCHARGED
15 minute winter	MH33	12	63.590	0.521	28.9	0.9567	0.0000	SURCHARGED
15 minute winter	MH34	11	63.072	0.111	38.1	0.2027	0.0000	OK
15 minute winter	MH38	11	63.558	0.208	12.2	0.4271	0.0000	SURCHARGED
15 minute winter	MH37	11	63.232	0.142	22.4	0.2649	0.0000	OK
15 minute winter	MH36	11	63.094	0.114	34.2	0.2085	0.0000	OK
15 minute winter	FW1B	11	61.734	0.104	83.4	0.1518	0.0000	OK
15 minute winter	UU2708	11	59.926	0.091	83.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH31	1.000	MH32	9.2	0.591	0.540	0.4805	
15 minute winter	MH32	1.001	MH33	18.2	1.035	1.277	0.1919	
15 minute winter	MH33	1.002	MH34	27.6	1.629	1.932	0.2626	
15 minute winter	MH34	1.003	FW1B	37.9	2.031	0.435	0.3217	
15 minute winter	MH38	1.004	MH37	10.8	1.384	0.988	0.0626	
15 minute winter	MH37	2.001	MH36	22.3	1.435	0.847	0.0279	
15 minute winter	MH36	1.005	FW1B	34.0	2.474	0.859	0.3780	
15 minute winter	FW1B	1.004_1	UU2708	83.4	5.061	0.347	0.1407	45.1

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH31	12	64.179	0.789	15.8	1.5686	0.0000	FLOOD RISK
15 minute winter	MH32	12	64.058	0.918	24.9	1.7090	0.0000	FLOOD RISK
15 minute winter	MH33	12	63.835	0.766	35.8	1.4072	0.0000	SURCHARGED
15 minute winter	MH34	11	63.089	0.128	47.6	0.2335	0.0000	OK
15 minute winter	MH38	12	63.814	0.464	15.8	0.9530	0.0000	SURCHARGED
15 minute winter	MH37	12	63.377	0.287	27.7	0.5333	0.0000	SURCHARGED
15 minute winter	MH36	12	63.284	0.304	41.8	0.5546	0.0000	SURCHARGED
15 minute winter	FW1B	11	61.748	0.118	100.1	0.1710	0.0000	OK
15 minute winter	UU2708	11	59.935	0.100	100.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	MH31	1.000	MH32	11.2	0.636	0.659	0.4805	
15 minute winter	MH32	1.001	MH33	22.3	1.265	1.561	0.1919	
15 minute winter	MH33	1.002	MH34	33.7	1.931	2.362	0.2794	
15 minute winter	MH34	1.003	FW1B	47.3	2.134	0.542	0.3818	
15 minute winter	MH38	1.004	MH37	12.6	1.608	1.147	0.0626	
15 minute winter	MH37	2.001	MH36	26.0	1.478	0.987	0.0322	
15 minute winter	MH36	1.005	FW1B	38.2	2.604	0.965	0.4459	
15 minute winter	FW1B	1.004_1	UU2708	100.0	5.257	0.416	0.1624	58.3

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
END	0.418	5.00	64.220		388126.920	396936.172	2.400
MH2	0.106	5.00	64.360	1200	388097.728	396829.987	2.570
MH1	0.028	5.00	64.350	1200	388085.979	396788.782	3.640
JUN 3	0.030	5.00	61.570		388083.104	396778.719	2.236
MH30	0.030	5.00	61.880	1200	388119.728	396767.099	2.930
MH29	0.030	5.00	62.010	1200	388127.755	396763.706	4.250
MH14	0.102	5.00	64.320	1200	388145.830	396861.797	0.203
MH BS10	0.102	5.00	64.020	1200	388127.042	396793.844	0.370
MH BS11	0.102	5.00	63.990	1200	388128.654	396793.322	0.460
G	0.078	5.00	64.350	450	388179.881	396774.991	0.700
JUN 1	0.078	5.00	64.290	1200	388127.476	396788.679	1.003
MH44	0.040	5.00	64.250	1200	388126.559	396785.065	4.230
MH20	0.040	5.00	63.420	1200	388185.970	396759.396	1.130
MH21	0.040	5.00	62.950	1200	388172.221	396763.322	1.120
MH22	0.040	5.00	62.480	1200	388148.925	396769.756	0.900
MH23	0.040	5.00	62.390	1200	388144.151	396771.131	0.830
MH43	0.040	5.00	62.390	1200	388136.522	396771.336	0.870
MH41	0.000	5.00	62.340	1200	388133.501	396771.894	4.870
JUN 2			62.050	1200	388132.523	396761.623	4.978
OF			61.620	1350	388130.278	396745.724	4.655

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	END	MH2	163.436	0.600	61.820	61.790	0.030	5447.9	225	7.72	50.0
1.001	MH2	MH1	42.847	0.600	61.790	61.600	0.190	225.0	225	8.54	50.0
1.002_1	MH1	JUN 3	10.466	0.600	60.710	59.334	1.376	7.6	225	8.58	50.0
1.003	JUN 3	MH30	38.423	0.600	59.334	58.950	0.384	100.0	225	9.07	50.0
1.002	MH30	MH29	8.715	0.600	58.950	57.760	1.190	7.3	225	8.06	50.0
1.005	MH29	JUN 2	5.203	0.600	57.760	57.447	0.313	16.6	225	8.09	50.0
3.000	MH14	MH BS10	70.504	0.600	64.117	63.650	0.467	151.0	100	6.89	50.0
2.001	MH BS10	MH BS11	1.694	0.600	63.650	63.530	0.120	14.1	150	6.90	50.0
3.002	MH BS11	JUN 1	4.790	0.600	63.530	63.287	0.243	19.7	150	6.97	50.0
3.000_1	G	JUN 1	54.163	0.600	63.650	63.501	0.149	363.5	225	6.33	50.0
3.003	JUN 1	MH44	3.729	0.600	63.287	63.098	0.189	19.7	150	7.03	50.0
3.004	MH44	MH41	6.283	0.600	60.020	59.957	0.063	99.7	150	7.05	50.0
11.001	MH20	MH21	14.299	0.600	62.290	61.830	0.460	31.1	225	5.28	50.0
11.002	MH21	MH22	24.168	0.600	61.830	61.580	0.250	96.7	225	5.84	50.0
11.003	MH22	MH23	4.968	0.600	61.580	61.560	0.020	248.4	225	5.93	50.0
4.003	MH23	MH43	7.632	0.600	61.560	61.520	0.040	190.8	225	6.06	50.0

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
11.005	MH43	MH41	3.072	0.600	61.520	61.180	0.340	9.0	225	6.14	50.0
3.006	MH41	JUN 2	10.317	0.600	57.470	57.401	0.069	149.5	375	6.78	50.0
1.004	JUN 2	OF	16.057	0.600	57.072	56.965	0.107	150.1	375	8.35	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 30 minute summer	147.452	41.724
1 year 15 minute winter	64.927	26.180	30 year 30 minute winter	103.475	41.724
1 year 30 minute summer	60.022	16.984	30 year 60 minute summer	98.615	26.061
1 year 30 minute winter	42.121	16.984	30 year 60 minute winter	65.517	26.061
1 year 60 minute summer	40.398	10.676	30 year 120 minute summer	59.946	15.842
1 year 60 minute winter	26.839	10.676	30 year 120 minute winter	39.827	15.842
1 year 120 minute summer	24.980	6.602	30 year 180 minute summer	45.598	11.734
1 year 120 minute winter	16.596	6.602	30 year 180 minute winter	29.640	11.734
1 year 180 minute summer	19.271	4.959	30 year 240 minute summer	35.759	9.450
1 year 180 minute winter	12.527	4.959	30 year 240 minute winter	23.758	9.450
1 year 240 minute summer	15.301	4.043	30 year 360 minute summer	26.939	6.932
1 year 240 minute winter	10.165	4.043	30 year 360 minute winter	17.511	6.932
1 year 360 minute summer	11.775	3.030	30 year 480 minute summer	20.981	5.545
1 year 360 minute winter	7.654	3.030	30 year 480 minute winter	13.940	5.545
1 year 480 minute summer	9.342	2.469	30 year 600 minute summer	17.039	4.661
1 year 480 minute winter	6.207	2.469	30 year 600 minute winter	11.642	4.661
1 year 600 minute summer	7.682	2.101	30 year 720 minute summer	15.093	4.045
1 year 600 minute winter	5.249	2.101	30 year 720 minute winter	10.143	4.045
1 year 720 minute summer	6.859	1.838	30 year 960 minute summer	12.278	3.233
1 year 720 minute winter	4.609	1.838	30 year 960 minute winter	8.133	3.233
1 year 960 minute summer	5.653	1.489	30 year 1440 minute summer	8.788	2.355
1 year 960 minute winter	3.745	1.489	30 year 1440 minute winter	5.906	2.355
1 year 1440 minute summer	4.127	1.106	100 year 15 minute summer	291.766	82.560
1 year 1440 minute winter	2.773	1.106	100 year 15 minute winter	204.748	82.560
30 year 15 minute summer	226.195	64.005	100 year 30 minute summer	191.982	54.324
30 year 15 minute winter	158.733	64.005	100 year 30 minute winter	134.724	54.324

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 60 minute summer	129.253	34.158	100 year 480 minute summer	27.350	7.228
100 year 60 minute winter	85.873	34.158	100 year 480 minute winter	18.171	7.228
100 year 120 minute summer	78.836	20.834	100 year 600 minute summer	22.137	6.055
100 year 120 minute winter	52.377	20.834	100 year 600 minute winter	15.126	6.055
100 year 180 minute summer	59.966	15.431	100 year 720 minute summer	19.562	5.243
100 year 180 minute winter	38.980	15.431	100 year 720 minute winter	13.147	5.243
100 year 240 minute summer	46.975	12.414	100 year 960 minute summer	15.851	4.174
100 year 240 minute winter	31.209	12.414	100 year 960 minute winter	10.500	4.174
100 year 360 minute summer	35.264	9.075	100 year 1440 minute summer	11.278	3.023
100 year 360 minute winter	22.923	9.075	100 year 1440 minute winter	7.579	3.023

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Results for 1 year Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	END	13	62.677	0.857	49.8	2.9842	0.0000	SURCHARGED
15 minute winter	MH2	13	62.033	0.243	43.5	0.4749	0.0000	SURCHARGED
15 minute winter	MH1	13	60.781	0.071	41.3	0.0912	0.0000	OK
15 minute winter	JUN 3	13	59.509	0.175	43.3	0.0468	0.0000	OK
15 minute winter	MH30	13	59.024	0.074	45.2	0.0992	0.0000	OK
15 minute winter	MH29	13	57.875	0.115	47.1	0.1458	0.0000	OK
15 minute winter	MH14	13	64.320	0.203	12.2	2.2695	0.0873	FLOOD
15 minute winter	MH BS10	12	63.748	0.098	17.5	0.6504	0.0000	OK
15 minute winter	MH BS11	12	63.727	0.197	28.2	1.0966	0.0000	FLOOD RISK
15 minute winter	G	11	63.740	0.090	9.3	0.2141	0.0000	OK
15 minute winter	JUN 1	12	63.580	0.293	41.3	0.7880	0.0000	SURCHARGED
15 minute winter	MH44	12	60.662	0.642	44.3	0.8476	0.0000	SURCHARGED
15 minute winter	MH20	10	62.324	0.034	4.8	0.0632	0.0000	OK
15 minute winter	MH21	10	61.894	0.064	9.5	0.1172	0.0000	OK
15 minute winter	MH22	11	61.698	0.118	14.1	0.2381	0.0000	OK
15 minute winter	MH23	11	61.672	0.112	18.4	0.2344	0.0000	OK
15 minute winter	MH43	11	61.586	0.066	23.0	0.1360	0.0000	OK
15 minute winter	MH41	11	57.655	0.185	66.5	0.2093	0.0000	OK
15 minute winter	JUN 2	12	57.325	0.253	112.1	0.2859	0.0000	OK
15 minute winter	OF	12	57.189	0.224	112.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	END	1.000	MH2	32.4	0.814	4.842	6.5000	
15 minute winter	MH2	1.001	MH1	39.4	1.051	1.142	1.5267	
15 minute winter	MH1	1.002_1	JUN 3	41.3	1.864	0.218	0.2292	
15 minute winter	JUN 3	1.003	MH30	43.2	1.924	0.831	0.8548	
15 minute winter	MH30	1.002	MH29	45.1	2.858	0.233	0.1382	
15 minute winter	MH29	1.005	JUN 2	47.2	2.621	0.368	0.0937	
15 minute winter	MH14	3.000	MH BS10	5.6	0.884	1.148	0.5502	
15 minute winter	MH BS10	2.001	MH BS11	16.0	1.443	0.336	0.0252	
15 minute winter	MH BS11	3.002	JUN 1	26.1	1.499	0.649	0.0843	
15 minute winter	G	3.000_1	JUN 1	8.4	0.644	0.313	0.7175	
15 minute winter	JUN 1	3.003	MH44	40.2	2.284	0.999	0.0656	
15 minute winter	MH44	3.004	MH41	44.0	2.500	2.476	0.1095	
15 minute winter	MH20	11.001	MH21	4.7	0.747	0.051	0.0930	
15 minute winter	MH21	11.002	MH22	9.3	0.629	0.176	0.3645	
15 minute winter	MH22	11.003	MH23	13.9	0.684	0.425	0.1012	
15 minute winter	MH23	4.003	MH43	18.5	1.269	0.495	0.1124	
15 minute winter	MH43	11.005	MH41	23.1	2.680	0.133	0.0265	
15 minute winter	MH41	3.006	JUN 2	66.4	1.323	0.406	0.5176	
15 minute winter	JUN 2	1.004	OF	112.2	1.518	0.688	1.1857	71.6

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Results for 30 year Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	END	10	64.220	2.400	115.8	14.9710	0.0000	FLOOD RISK
15 minute winter	MH2	13	63.296	1.506	94.9	2.9456	0.0000	SURCHARGED
15 minute winter	MH1	14	61.232	0.522	98.2	0.6705	0.0000	SURCHARGED
15 minute winter	JUN 3	14	60.809	1.475	100.1	0.3954	0.0000	SURCHARGED
15 minute winter	MH30	14	59.072	0.122	100.7	0.1632	0.0000	OK
15 minute winter	MH29	13	58.049	0.289	105.4	0.3671	0.0000	SURCHARGED
30 minute winter	MH14	15	64.320	0.203	22.9	2.2695	8.5516	FLOOD
15 minute winter	MH BS10	10	64.020	0.370	33.4	2.4583	3.3122	FLOOD
15 minute winter	MH BS11	10	63.990	0.460	44.3	2.5604	4.6639	FLOOD
15 minute winter	G	11	64.030	0.380	22.7	0.9071	0.0000	SURCHARGED
15 minute winter	JUN 1	11	63.931	0.644	63.3	1.7285	0.0000	SURCHARGED
15 minute winter	MH44	12	61.398	1.378	68.5	1.8189	0.0000	SURCHARGED
15 minute winter	MH20	10	62.343	0.053	11.6	0.0977	0.0000	OK
15 minute winter	MH21	10	61.932	0.102	23.1	0.1890	0.0000	OK
15 minute winter	MH22	11	61.798	0.218	34.4	0.4402	0.0000	OK
15 minute winter	MH23	11	61.754	0.194	45.0	0.4068	0.0000	OK
15 minute winter	MH43	11	61.638	0.118	56.1	0.2411	0.0000	OK
15 minute winter	MH41	11	57.744	0.274	122.6	0.3104	0.0000	OK
15 minute winter	JUN 2	12	57.601	0.529	220.3	0.5985	0.0000	SURCHARGED
15 minute winter	OF	12	57.300	0.335	219.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	END	1.000	MH2	68.5	1.723	10.254	6.5000	
15 minute winter	MH2	1.001	MH1	92.5	2.326	2.682	1.6868	
15 minute winter	MH1	1.002_1	JUN 3	95.1	2.454	0.501	0.4162	
15 minute winter	JUN 3	1.003	MH30	97.2	2.780	1.869	1.1868	
15 minute winter	MH30	1.002	MH29	100.9	3.150	0.521	0.2692	
15 minute winter	MH29	1.005	JUN 2	105.0	2.939	0.819	0.1789	
30 minute winter	MH14	3.000	MH BS10	5.6	0.886	1.154	0.5516	
15 minute winter	MH BS10	2.001	MH BS11	17.4	1.431	0.365	0.0298	
15 minute winter	MH BS11	3.002	JUN 1	28.4	1.626	0.706	0.0843	
15 minute winter	G	3.000_1	JUN 1	20.7	0.633	0.767	2.1541	
15 minute winter	JUN 1	3.003	MH44	57.5	3.265	1.428	0.0656	
15 minute winter	MH44	3.004	MH41	66.9	3.798	3.761	0.1095	
15 minute winter	MH20	11.001	MH21	11.5	0.948	0.123	0.1767	
15 minute winter	MH21	11.002	MH22	22.8	0.760	0.431	0.6867	
15 minute winter	MH22	11.003	MH23	33.8	0.887	1.031	0.1884	
15 minute winter	MH23	4.003	MH43	45.1	1.538	1.203	0.2191	
15 minute winter	MH43	11.005	MH41	56.3	3.199	0.323	0.0541	
15 minute winter	MH41	3.006	JUN 2	122.5	1.529	0.750	0.8249	
15 minute winter	JUN 2	1.004	OF	219.6	1.993	1.347	1.7206	160.8

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Results for 100 year Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	END	9	64.220	2.400	149.4	22.4251	0.0000	FLOOD RISK
15 minute winter	MH2	13	64.125	2.335	116.7	4.5676	0.0000	FLOOD RISK
15 minute winter	MH1	14	61.989	1.279	120.1	1.6435	0.0000	SURCHARGED
15 minute winter	JUN 3	14	61.378	2.044	121.4	0.5479	0.0000	FLOOD RISK
15 minute winter	MH30	13	59.124	0.174	123.1	0.2319	0.0000	OK
15 minute winter	MH29	13	58.342	0.582	129.6	0.7402	0.0000	SURCHARGED
30 minute winter	MH14	13	64.320	0.203	29.8	2.2695	14.1093	FLOOD
15 minute winter	MH BS10	9	64.020	0.370	42.0	2.4583	6.7393	FLOOD
15 minute winter	MH BS11	9	63.990	0.460	52.9	2.5604	11.2592	FLOOD
15 minute winter	G	11	64.168	0.518	29.3	1.2374	0.0000	FLOOD RISK
15 minute winter	JUN 1	10	63.988	0.701	68.1	1.8831	0.0000	SURCHARGED
15 minute winter	MH44	11	61.647	1.627	74.8	2.1483	0.0000	SURCHARGED
15 minute winter	MH20	10	62.350	0.060	15.0	0.1112	0.0000	OK
15 minute winter	MH21	11	61.959	0.129	29.9	0.2381	0.0000	OK
15 minute winter	MH22	11	61.895	0.315	43.5	0.6363	0.0000	SURCHARGED
15 minute winter	MH23	11	61.830	0.270	56.8	0.5666	0.0000	SURCHARGED
15 minute winter	MH43	11	61.659	0.139	71.0	0.2857	0.0000	OK
15 minute winter	MH41	12	57.832	0.362	144.1	0.4097	0.0000	OK
15 minute winter	JUN 2	12	57.746	0.674	263.5	0.7618	0.0000	SURCHARGED
15 minute winter	OF	12	57.317	0.352	263.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	END	1.000	MH2	83.6	2.102	12.505	6.5000	
15 minute winter	MH2	1.001	MH1	111.9	2.813	3.244	1.7041	
15 minute winter	MH1	1.002_1	JUN 3	113.0	2.842	0.595	0.4162	
15 minute winter	JUN 3	1.003	MH30	116.9	3.074	2.250	1.3956	
15 minute winter	MH30	1.002	MH29	123.1	3.221	0.636	0.3165	
15 minute winter	MH29	1.005	JUN 2	130.2	3.275	1.016	0.2069	
30 minute winter	MH14	3.000	MH BS10	5.5	0.894	1.119	0.5516	
15 minute winter	MH BS10	2.001	MH BS11	16.6	1.426	0.349	0.0298	
15 minute winter	MH BS11	3.002	JUN 1	28.2	1.604	0.701	0.0843	
15 minute winter	G	3.000_1	JUN 1	28.5	0.717	1.055	2.1541	
15 minute winter	JUN 1	3.003	MH44	59.8	3.398	1.486	0.0656	
15 minute winter	MH44	3.004	MH41	73.0	4.145	4.104	0.1095	
15 minute winter	MH20	11.001	MH21	14.9	1.003	0.159	0.2275	
15 minute winter	MH21	11.002	MH22	28.5	0.819	0.539	0.7651	
15 minute winter	MH22	11.003	MH23	42.7	1.074	1.302	0.1976	
15 minute winter	MH23	4.003	MH43	56.9	1.566	1.518	0.2502	
15 minute winter	MH43	11.005	MH41	71.1	3.325	0.408	0.0656	
15 minute winter	MH41	3.006	JUN 2	142.9	1.556	0.875	1.1098	
15 minute winter	JUN 2	1.004	OF	263.3	2.387	1.614	1.7477	199.5

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