

Technical Note

To: Knowsley Council LLFA

From: Curtins Liverpool

Subject: 25/00688/FUL Drainage Strategy – Additional information

Reference: 088269-CUR-XX-XX-T-C-00005

Date: 1st April 2026

This technical note is to be read in conjunction with the proposed developments Flood Risk Assessment (088269-CUR-XX-XX-T-C-00001) and Drainage Strategy Note (088269-CUR-XX-XX-T-C-00002).

The proposals for the drainage strategy are based on the requirements of Knowsley Council in their role as Lead Local Flood Authority (LLFA), United Utilities (UU) in their role as the water authority, the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG), and DEFRA Non-Statutory Technical Standards for Sustainable Drainage System.

The drainage strategy has been designed in accordance with the latest climate change requirements, relative to the proposed development use. The Flood Risk Assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments.

Please see below response to the LLFA's comments as statutory consultee.

LLFA Response

The development site is brownfield and the maximum surface water from the site has been estimated to be 318.5l/s for an event with the probability of 1 in 100 years plus 45% impact of climate change while no evidence of such a calculation has been provided. The estimated figure seems to be overestimated considering the size of the recipient UU pipes. As a minimum, brownfield sites should reduce the discharge by a 50% betterment, from the existing site runoff OR from the original un-surcharged pipe-full capacity of the existing system, whichever is the lowest, depending on sufficient capacity in the recipient feature(s). Therefore, calculations of the exiting site discharge rate as well as estimation of the original un-surcharged pipe-full capacity at outlet(s) both will be required. In cases where the surface water discharges to the UU system, the maximum discharge rate will be determined by the LLFA in collaboration with the UU to make sure there is spare capacity in the receiving sewer system. At the present time, we cannot confirm the proposed discharge rate of 145.9l/s for post development as long as no information is available in relation to the existing outlet pipe characteristics and the spare capacity of the receiving public sewer system.

Curtins response: The calculations and the plans and catchments have been provided within the FRA along with GPR etc. Please see attached hydraulic calculations for existing network. As no new connections are being made, the flow into UU's sewers is reduced in line with their requirements.

From the submitted drainage drawing, it is not clear how many connection point(s) has been proposed for surface water and what is the maximum discharge rate at each.

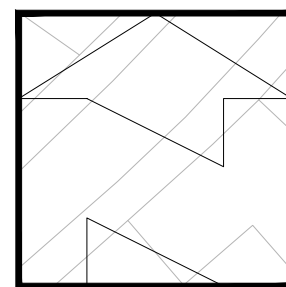
Curtins response: There is one main outfall into the existing public network at the northwest of the site which is noted as having a max flow rate of 145.9 l/s at SW13 FC. This outfall is via the existing rainwater harvesting system. An additional point of connection is at the northeast which allows the new stand to be constructed. This is intentionally not limited in flow as it discharges into the wider site rainwater harvesting and water management network where inflows are used for the maintenance of the site. There is no increase in flow into this system and it will continue to perform as it does so now.

Where the proposals are connected to an existing drainage system, it is likely that the authorities responsible for maintaining those systems will have their own design requirements (e.g. easement required). These requirements will need to be reviewed and agreed as part of any surface water drainage scheme.

Curtins response: There are no authorities, only the asset owner, which is LFC as landowner, so no easements. Drainage maintenance is carried out by estates.

No information of the long term management and maintenance of the proposed system has been provided. The mechanism for securing long-term maintenance will need to be considered and agreed between the applicant and the Local Planning Authority. This may involve discussions with those adopting and/or maintaining the proposed systems, which could include the Highway Authority, Planning Authority, Parish Councils, Water Companies and private management companies. A management and maintenance plan for the proposed drainage system, arrangements for adoption and means of access for inspection and maintenance purposes shall be considered.

Curtins response: Please see appended maintenance schedule for the drainage system.



GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.

KEY

-  EXISTING PRIVATE SURFACE WATER
-  EXISTING ADOPTED SURFACE WATER
-  EXISTING PRIVATE FOUL WATER
-  EXISTING ADOPTED FOUL WATER
-  EXISTING PRIVATE COMBINED WATER

P01	ISSUED FOR PLANNING (S2)	25/11/25	RIT	MB
Rev:	Description:	Date:	By:	Chkd:

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Status: **SUITABLE FOR INFORMATION** **S2**

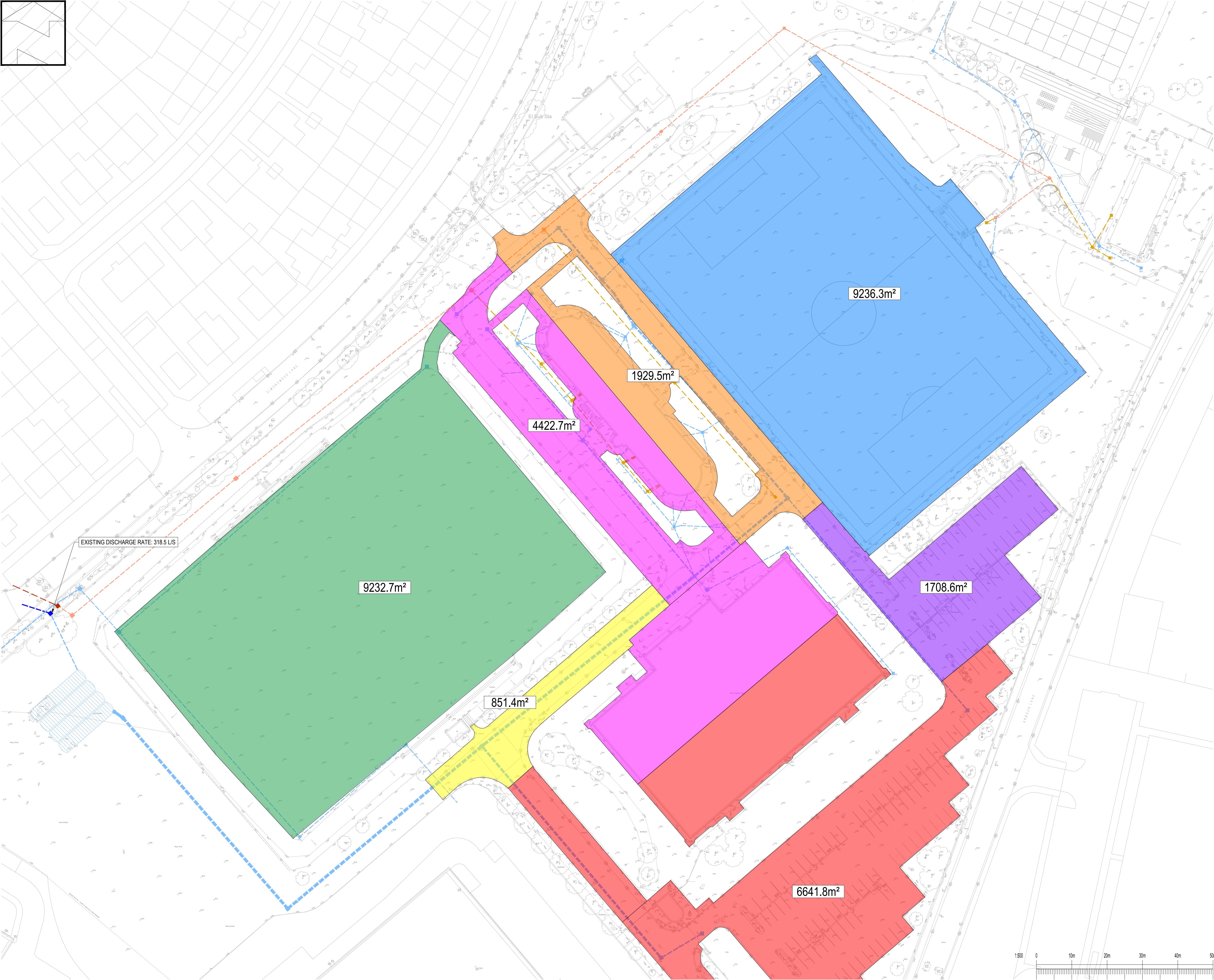
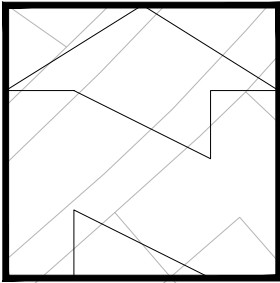
Project: **LIVERPOOL FC TRAINING CENTRE ACADEMY**

Org Title:

EXISTING DRAINAGE

Drawn By RIT	Designed By RIT	Checked By JDB
	Date 25/11/2025	Scales @ A1 1:500

088269 - CUR - XX - XX- DR- C- 76000	P01
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P01	ISSUED FOR PLANNING (S2)	25/11/25	RIT	MB
Rev:	Description:	Date:	By:	Chkd:

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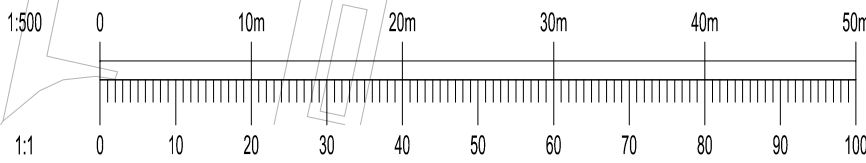
Status:	SUITABLE FOR INFORMATION	S2
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Project:	LIVERPOOL FC TRAINING CENTRE ACADEMY
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Orig Title:	EXISTING DRAINAGE CATCHMENTS
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Drawn By	Designed By	Checked By
RIT	RIT	JDB
Date	25/11/2025	Scales @ A1
25/11/2025		1:500
Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision	

088269 - CUR - XX - XX - DR - C - 76500	P01
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Curtins	Curtins Consulting Ltd	File: Existing Drainage No Tank.pfd		Page 1								
		Network: SW Jake Busby 17/03/2026										
Design Settings												
Rainfall Methodology FSR				Maximum Time of Concentration (mins) 30.00								
Return Period (years) 2				Maximum Rainfall (mm/hr) 50.0								
Additional Flow (%) 0				Minimum Velocity (m/s) 1.00								
FSR Region England and Wales				Connection Type Level Soffits								
M5-60 (mm) 20.000				Minimum Backdrop Height (m) 0.200								
Ratio-R 0.400				Preferred Cover Depth (m) 1.200								
CV 1.000				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)	Node Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)			
✓	MH53	0.171	5.00	38.208	Manhole	1500	342455.465	398436.212	1.868			
✓	MH54	0.193	5.00	38.095	Manhole	1500	342404.570	398496.303	2.675			
✓	MH48	0.442	5.00	38.001	Manhole	1500	342378.175	398474.195	2.681			
✓	MH49	0.085	5.00	37.952	Manhole	1500	342317.996	398426.083	3.142			
✓	MH59			37.901	Manhole	1500	342385.596	398518.398	2.231			
✓	MH58			37.734	Manhole	1500	342361.025	398545.186	2.024			
✓	MH50			37.727	Manhole	1500	342263.036	398380.056	3.561			
✓	MH56	0.924	5.00	37.567	Manhole	1500	342351.985	398558.055	1.777			
✓	MH55			37.503	Manhole	1500	342339.773	398572.796	1.703			
✓	MH66	0.664	5.00	37.490	Manhole	1500	342368.731	398366.140	1.890			
✓	MH60		5.00	37.249	Manhole	1500	342310.909	398548.369	1.109			
✓	MH51			35.800	Manhole	1500	342216.379	398434.079	2.824			
✓	MH52			35.790	Manhole	1500	342213.950	398435.824	5.370			
✓	UU 2403			33.760	Manhole	1200	342195.872	398463.649	1.500			
Links												
	Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
✓	PN32	MH48	MH49	77.047	0.600	35.320	34.810	0.510	151.1	750	Circular	8.21
?	PN33	MH49	MH50	71.687	0.600	34.810	34.332	0.478	150.0	750	Circular	8.74
?	PN34	MH50	MH51	71.382	0.600	34.166	32.976	1.190	60.0	750	Circular	9.07
?	PN35	MH51	MH52	2.991	0.600	32.976	30.420	2.556	1.2	750	Circular	9.07
✓	PN36	MH53	MH54	78.748	0.600	36.340	35.420	0.920	85.6	300	Circular	5.77
✓	PN37	MH54	MH48	34.431	0.600	35.420	35.320	0.100	344.3	600	Circular	7.65
?	PN38	MH55	MH56	19.142	0.600	35.800	35.790	0.010	1914.2	525	Circular	6.06
✓	PN40	MH56	MH58	10.746	0.600	35.790	35.710	0.080	134.3	525	Circular	6.15
?	PN41	MH58	MH59	36.350	0.600	35.710	35.670	0.040	908.8	525	Circular	6.98
	Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
✓	PN32	MH48	MH49	2.274	1004.7	312.6	1.931	2.392	1.730	0.0	286	2.020
?	PN33	MH49	MH50	2.283	1008.4	448.0	2.392	2.645	2.479	0.0	350	2.218
?	PN34	MH50	MH51	3.617	1597.8	447.1	2.811	2.074	2.479	0.0	270	3.125
?	PN35	MH51	MH52	25.976	11475.8	446.2	2.074	4.620	2.479	0.0	99	12.974
✓	PN36	MH53	MH54	1.700	120.2	30.9	1.568	2.375	0.171	0.0	103	1.432
✓	PN37	MH54	MH48	1.306	369.4	232.7	2.075	2.081	1.288	0.0	346	1.377
?	PN38	MH55	MH56	0.503	108.8	0.0	1.178	1.252	0.000	0.0	0	0.000
✓	PN40	MH56	MH58	1.931	417.9	167.0	1.252	1.499	0.924	0.0	230	1.827
?	PN41	MH58	MH59	0.735	159.0	167.0	1.499	1.706	0.924	0.0	464	0.825
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Links

	Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
✓	PN42	MH59	MH54	29.124	0.600	35.670	35.420	0.250	116.5	525	Circular	7.21
?	PN43	MH60	MH55	37.813	0.600	36.140	35.800	0.340	111.2	300	Circular	5.42
?	PN49	MH66	MH49	78.532	0.600	35.600	34.810	0.790	99.4	600	Circular	5.54
?	1.010	MH52	UU 2403	33.182	0.600	32.591	32.260	0.331	100.2	300	Circular	9.42

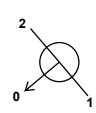
	Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
✓	PN42	MH59	MH54	2.074	449.0	167.0	1.706	2.150	0.924	0.0	221	1.928
?	PN43	MH60	MH55	1.490	105.3	0.0	0.809	1.403	0.000	0.0	0	0.000
?	PN49	MH66	MH49	2.442	690.5	120.0	1.290	2.542	0.664	0.0	168	1.854
?	1.010	MH52	UU 2403	1.570	111.0	444.4	2.899	1.200	2.479	0.0	300	1.590

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
PN32	77.047	151.1	750	Circular	38.001	35.320	1.931	37.952	34.810	2.392
PN33	71.687	150.0	750	Circular	37.952	34.810	2.392	37.727	34.332	2.645
PN34	71.382	60.0	750	Circular	37.727	34.166	2.811	35.800	32.976	2.074
PN35	2.991	1.2	750	Circular	35.800	32.976	2.074	35.790	30.420	4.620
PN36	78.748	85.6	300	Circular	38.208	36.340	1.568	38.095	35.420	2.375
PN37	34.431	344.3	600	Circular	38.095	35.420	2.075	38.001	35.320	2.081
PN38	19.142	1914.2	525	Circular	37.503	35.800	1.178	37.567	35.790	1.252
PN40	10.746	134.3	525	Circular	37.567	35.790	1.252	37.734	35.710	1.499
PN41	36.350	908.8	525	Circular	37.734	35.710	1.499	37.901	35.670	1.706
PN42	29.124	116.5	525	Circular	37.901	35.670	1.706	38.095	35.420	2.150
PN43	37.813	111.2	300	Circular	37.249	36.140	0.809	37.503	35.800	1.403
PN49	78.532	99.4	600	Circular	37.490	35.600	1.290	37.952	34.810	2.542
1.010	33.182	100.2	300	Circular	35.790	32.591	2.899	33.760	32.260	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
PN32	MH48	1500	Manhole	Adoptable	MH49	1500	Manhole	Adoptable
PN33	MH49	1500	Manhole	Adoptable	MH50	1500	Manhole	Adoptable
PN34	MH50	1500	Manhole	Adoptable	MH51	1500	Manhole	Adoptable
PN35	MH51	1500	Manhole	Adoptable	MH52	1500	Manhole	Adoptable
PN36	MH53	1500	Manhole	Adoptable	MH54	1500	Manhole	Adoptable
PN37	MH54	1500	Manhole	Adoptable	MH48	1500	Manhole	Adoptable
PN38	MH55	1500	Manhole	Adoptable	MH56	1500	Manhole	Adoptable
PN40	MH56	1500	Manhole	Adoptable	MH58	1500	Manhole	Adoptable
PN41	MH58	1500	Manhole	Adoptable	MH59	1500	Manhole	Adoptable
PN42	MH59	1500	Manhole	Adoptable	MH54	1500	Manhole	Adoptable
PN43	MH60	1500	Manhole	Adoptable	MH55	1500	Manhole	Adoptable
PN49	MH66	1500	Manhole	Adoptable	MH49	1500	Manhole	Adoptable
1.010	MH52	1500	Manhole	Adoptable	UU 2403	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	Link Type	
MH53	342455.465	398436.212	38.208	1.868	1500		0	PN36	36.340	300	Circular
MH54	342404.570	398496.303	38.095	2.675	1500		1	PN36	35.420	300	Circular
							2	PN42	35.420	525	Circular
							0	PN37	35.420	600	Circular
MH48	342378.175	398474.195	38.001	2.681	1500		1	PN37	35.320	600	Circular
							0	PN32	35.320	750	Circular
MH49	342317.996	398426.083	37.952	3.142	1500		1	PN49	34.810	600	Circular
							2	PN32	34.810	750	Circular
							0	PN33	34.810	750	Circular
MH59	342385.596	398518.398	37.901	2.231	1500		1	PN41	35.670	525	Circular
							0	PN42	35.670	525	Circular
MH58	342361.025	398545.186	37.734	2.024	1500		1	PN40	35.710	525	Circular
							0	PN41	35.710	525	Circular
MH50	342263.036	398380.056	37.727	3.561	1500		1	PN33	34.332	750	Circular
							0	PN34	34.166	750	Circular
MH56	342351.985	398558.055	37.567	1.777	1500		1	PN38	35.790	525	Circular
							0	PN40	35.790	525	Circular
MH55	342339.773	398572.796	37.503	1.703	1500		1	PN43	35.800	300	Circular
							0	PN38	35.800	525	Circular
MH66	342368.731	398366.140	37.490	1.890	1500		0	PN49	35.600	600	Circular
MH60	342310.909	398548.369	37.249	1.109	1500		0	PN43	36.140	300	Circular
MH51	342216.379	398434.079	35.800	2.824	1500		1	PN34	32.976	750	Circular
							0	PN35	32.976	750	Circular
MH52	342213.950	398435.824	35.790	5.370	1500		1	PN35	30.420	750	Circular
							0	1.010	32.591	300	Circular

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	Link Type
UU 2403	342195.872	398463.649	33.760	1.500	1200	1	1.010	32.260	300	Circular

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	141.566	40.058	2 year 600 minute winter	7.576	3.033
2 year 15 minute winter	99.345	40.058	2 year 720 minute summer	9.878	2.647
2 year 30 minute summer	91.753	25.963	2 year 720 minute winter	6.639	2.647
2 year 30 minute winter	64.388	25.963	2 year 960 minute summer	8.113	2.136
2 year 60 minute summer	61.301	16.200	2 year 960 minute winter	5.374	2.136
2 year 60 minute winter	40.727	16.200	2 year 1440 minute summer	5.891	1.579
2 year 120 minute summer	37.449	9.897	2 year 1440 minute winter	3.959	1.579
2 year 120 minute winter	24.880	9.897	30 year 15 minute summer	268.706	76.035
2 year 180 minute summer	28.672	7.378	30 year 15 minute winter	188.566	76.035
2 year 180 minute winter	18.637	7.378	30 year 30 minute summer	174.929	49.499
2 year 240 minute summer	22.636	5.982	30 year 30 minute winter	122.757	49.499
2 year 240 minute winter	15.039	5.982	30 year 60 minute summer	116.589	30.811
2 year 360 minute summer	17.235	4.435	30 year 60 minute winter	77.459	30.811
2 year 360 minute winter	11.203	4.435	30 year 120 minute summer	70.438	18.615
2 year 480 minute summer	13.550	3.581	30 year 120 minute winter	46.797	18.615
2 year 480 minute winter	9.003	3.581	30 year 180 minute summer	53.298	13.715
2 year 600 minute summer	11.088	3.033	30 year 180 minute winter	34.645	13.715

Curtins	Curtins Consulting Ltd	File: Existing Drainage No Tank.pfd Network: SW Jake Busby 17/03/2026	Page 5		
Rainfall					
Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 240 minute summer	41.604	10.995	100 year 60 minute winter	101.841	40.510
30 year 240 minute winter	27.641	10.995	100 year 120 minute summer	92.562	24.461
30 year 360 minute summer	31.221	8.034	100 year 120 minute winter	61.496	24.461
30 year 360 minute winter	20.295	8.034	100 year 180 minute summer	69.806	17.964
30 year 480 minute summer	24.324	6.428	100 year 180 minute winter	45.376	17.964
30 year 480 minute winter	16.160	6.428	100 year 240 minute summer	54.269	14.342
30 year 600 minute summer	19.756	5.404	100 year 240 minute winter	36.055	14.342
30 year 600 minute winter	13.498	5.404	100 year 360 minute summer	40.484	10.418
30 year 720 minute summer	17.490	4.687	100 year 360 minute winter	26.315	10.418
30 year 720 minute winter	11.754	4.687	100 year 480 minute summer	31.414	8.302
30 year 960 minute summer	14.215	3.743	100 year 480 minute winter	20.871	8.302
30 year 960 minute winter	9.416	3.743	100 year 600 minute summer	25.431	6.956
30 year 1440 minute summer	10.161	2.723	100 year 600 minute winter	17.376	6.956
30 year 1440 minute winter	6.829	2.723	100 year 720 minute summer	22.452	6.017
30 year +40% CC 15 minute summer	376.189	106.449	100 year 720 minute winter	15.089	6.017
30 year +40% CC 15 minute winter	263.992	106.449	100 year 960 minute summer	18.166	4.784
30 year +40% CC 30 minute summer	244.900	69.298	100 year 960 minute winter	12.033	4.784
30 year +40% CC 30 minute winter	171.860	69.298	100 year 1440 minute summer	12.896	3.456
30 year +40% CC 60 minute summer	163.225	43.136	100 year 1440 minute winter	8.667	3.456
30 year +40% CC 60 minute winter	108.443	43.136	100 year +45% CC 15 minute summer	505.670	143.087
30 year +40% CC 120 minute summer	98.613	26.061	100 year +45% CC 15 minute winter	354.856	143.087
30 year +40% CC 120 minute winter	65.516	26.061	100 year +45% CC 30 minute summer	332.000	93.944
30 year +40% CC 180 minute summer	74.617	19.202	100 year +45% CC 30 minute winter	232.982	93.944
30 year +40% CC 180 minute winter	48.503	19.202	100 year +45% CC 60 minute summer	222.268	58.739
30 year +40% CC 240 minute summer	58.245	15.393	100 year +45% CC 60 minute winter	147.669	58.739
30 year +40% CC 240 minute winter	38.697	15.393	100 year +45% CC 120 minute summer	134.215	35.469
30 year +40% CC 360 minute summer	43.710	11.248	100 year +45% CC 120 minute winter	89.169	35.469
30 year +40% CC 360 minute winter	28.413	11.248	100 year +45% CC 180 minute summer	101.219	26.047
30 year +40% CC 480 minute summer	34.053	8.999	100 year +45% CC 180 minute winter	65.795	26.047
30 year +40% CC 480 minute winter	22.624	8.999	100 year +45% CC 240 minute summer	78.690	20.795
30 year +40% CC 600 minute summer	27.658	7.565	100 year +45% CC 240 minute winter	52.280	20.795
30 year +40% CC 600 minute winter	18.898	7.565	100 year +45% CC 360 minute summer	58.701	15.106
30 year +40% CC 720 minute summer	24.485	6.562	100 year +45% CC 360 minute winter	38.157	15.106
30 year +40% CC 720 minute winter	16.456	6.562	100 year +45% CC 480 minute summer	45.550	12.038
30 year +40% CC 960 minute summer	19.901	5.240	100 year +45% CC 480 minute winter	30.262	12.038
30 year +40% CC 960 minute winter	13.183	5.240	100 year +45% CC 600 minute summer	36.875	10.086
30 year +40% CC 1440 minute summer	14.225	3.812	100 year +45% CC 600 minute winter	25.195	10.086
30 year +40% CC 1440 minute winter	9.560	3.812	100 year +45% CC 720 minute summer	32.556	8.725
100 year 15 minute summer	348.738	98.681	100 year +45% CC 720 minute winter	21.879	8.725
100 year 15 minute winter	244.728	98.681	100 year +45% CC 960 minute summer	26.340	6.936
100 year 30 minute summer	228.965	64.789	100 year +45% CC 960 minute winter	17.448	6.936
100 year 30 minute winter	160.677	64.789	100 year +45% CC 1440 minute summer	18.700	5.012
100 year 60 minute summer	153.288	40.510	100 year +45% CC 1440 minute winter	12.567	5.012
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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH53	10	36.456	0.116	39.5	0.4163	0.0000	OK
15 minute summer	MH54	11	35.823	0.403	283.5	1.2927	0.0000	OK
15 minute summer	MH48	11	35.654	0.334	380.4	1.6900	0.0000	OK
15 minute summer	MH49	14	35.308	0.498	544.3	1.1487	0.0000	OK
15 minute summer	MH59	11	35.948	0.278	203.1	0.4921	0.0000	OK
15 minute summer	MH58	11	36.110	0.400	203.2	0.7069	0.0000	OK
15 minute summer	MH50	13	35.381	1.215	530.3	2.1472	0.0000	SURCHARGED
15 minute summer	MH56	11	36.160	0.370	213.5	4.4999	0.0000	OK
15 minute summer	MH55	11	36.160	0.360	16.6	0.6366	0.0000	OK
15 minute summer	MH66	10	35.786	0.186	153.4	1.6382	0.0000	OK
15 minute summer	MH60	11	36.168	0.028	1.8	0.0501	0.0000	OK
15 minute summer	MH51	13	35.406	2.430	488.9	4.2940	0.0000	SURCHARGED
15 minute summer	MH52	13	35.393	4.973	316.4	8.7868	0.0000	SURCHARGED
15 minute summer	UU 2403	10	32.544	0.284	296.4	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 summer	MH53	PN36	MH54	38.6	0.688	0.321	3.7587	
15 minute summer	MH54	PN37	MH48	282.8	1.611	0.766	6.2334	
15 minute summer	MH48	PN32	MH49	377.0	1.763	0.375	16.7579	
15 minute summer	MH49	PN33	MH50	530.3	2.228	0.526	26.8944	
15 minute summer	MH59	PN42	MH54	202.6	1.383	0.451	4.2820	
15 minute summer	MH58	PN41	MH59	203.1	1.377	1.277	5.3226	
15 minute summer	MH50	PN34	MH51	488.9	3.187	0.306	31.4167	
15 minute summer	MH56	PN40	MH58	203.2	1.217	0.486	1.8223	
15 minute summer	MH55	PN38	MH56	-16.6	-0.346	-0.152	3.0680	
15 minute summer	MH66	PN49	MH49	150.8	1.363	0.218	11.3207	
15 minute summer	MH60	PN43	MH55	-1.8	-0.042	-0.017	1.3946	
15 minute summer	MH51	PN35	MH52	316.4	1.324	0.028	1.3164	
15 minute summer	MH52	1.010	UU 2403	296.4	4.210	2.671	2.3130	241.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH53	13	36.957	0.617	74.9	2.2189	0.0000	SURCHARGED
30 minute summer	MH54	20	36.733	1.313	467.5	4.2149	0.0000	SURCHARGED
30 minute summer	MH48	20	36.586	1.266	619.4	6.4094	0.0000	SURCHARGED
15 minute summer	MH49	12	36.502	1.692	956.4	3.9054	0.0000	SURCHARGED
30 minute summer	MH59	20	36.859	1.189	322.1	2.1009	0.0000	SURCHARGED
30 minute summer	MH58	20	36.992	1.282	322.8	2.2657	0.0000	SURCHARGED
15 minute winter	MH50	12	36.182	2.016	762.1	3.5624	0.0000	SURCHARGED
30 minute summer	MH56	20	37.053	1.263	362.1	15.3614	0.0000	SURCHARGED
30 minute summer	MH55	20	37.057	1.257	30.8	2.2219	0.0000	SURCHARGED
15 minute summer	MH66	12	36.793	1.193	291.2	10.4942	0.0000	SURCHARGED
15 minute summer	MH60	13	37.110	0.970	29.5	1.7140	0.0000	FLOOD RISK
30 minute summer	MH51	18	35.800	2.824	731.4	4.9900	102.0413	FLOOD
30 minute summer	MH52	18	35.790	5.370	344.7	9.4888	1.5804	FLOOD
15 minute summer	UU 2403	9	32.544	0.284	318.5	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 summer	MH53	PN36	MH54	73.7	1.179	0.613	5.5454	
30 minute summer	MH54	PN37	MH48	446.2	1.637	1.208	9.6984	
30 minute summer	MH48	PN32	MH49	552.5	1.855	0.550	33.9100	
15 minute summer	MH49	PN33	MH50	864.7	2.233	0.857	31.5509	
30 minute summer	MH59	PN42	MH54	325.0	1.505	0.724	6.2917	
30 minute summer	MH58	PN41	MH59	322.1	1.491	2.025	7.8528	
15 minute winter	MH50	PN34	MH51	705.4	3.045	0.441	31.4167	
30 minute summer	MH56	PN40	MH58	322.8	1.494	0.772	2.3215	
30 minute summer	MH55	PN38	MH56	32.6	-0.349	0.299	4.1353	
15 minute summer	MH66	PN49	MH49	287.5	1.532	0.416	22.1207	
15 minute summer	MH60	PN43	MH55	-29.5	-0.466	-0.280	2.6628	
30 minute summer	MH51	PN35	MH52	344.7	1.028	0.030	1.3164	
30 minute summer	MH52	1.010	UU 2403	318.5	4.524	2.870	2.3130	500.4

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH53	12	38.023	1.683	105.0	6.0556	0.0000	FLOOD RISK
15 minute summer	MH54	11	37.534	2.114	536.7	6.7846	0.0000	SURCHARGED
15 minute summer	MH48	11	37.427	2.107	773.5	10.6697	0.0000	SURCHARGED
15 minute summer	MH49	11	37.143	2.333	1136.0	5.3853	0.0000	SURCHARGED
15 minute summer	MH59	11	37.563	1.893	361.2	3.3442	0.0000	SURCHARGED
15 minute summer	MH58	11	37.558	1.848	385.6	3.2651	0.0000	FLOOD RISK
15 minute summer	MH50	11	36.510	2.344	1041.3	4.1416	0.0000	SURCHARGED
15 minute summer	MH56	11	37.567	1.777	567.3	21.6208	11.6476	FLOOD
30 minute summer	MH55	18	37.503	1.703	216.1	3.0092	19.2070	FLOOD
15 minute summer	MH66	11	37.483	1.883	407.7	16.5570	0.0000	FLOOD RISK
30 minute summer	MH60	18	37.249	1.109	82.7	1.9596	19.0370	FLOOD
30 minute winter	MH51	16	35.800	2.824	920.3	4.9900	255.6428	FLOOD
30 minute summer	MH52	16	35.786	5.366	318.5	9.4823	0.0000	FLOOD RISK
15 minute summer	UU 2403	8	32.544	0.284	318.5	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 summer	MH53	PN36	MH54	96.1	1.365	0.800	5.5454	
15 minute summer	MH54	PN37	MH48	515.3	1.832	1.395	9.6984	
15 minute summer	MH48	PN32	MH49	713.0	1.961	0.710	33.9100	
15 minute summer	MH49	PN33	MH50	1041.3	2.366	1.033	31.5509	
15 minute summer	MH59	PN42	MH54	340.8	1.578	0.759	6.2917	
15 minute summer	MH58	PN41	MH59	361.2	1.672	2.271	7.8528	
15 minute summer	MH50	PN34	MH51	1024.2	3.279	0.641	31.4167	
15 minute summer	MH56	PN40	MH58	385.6	1.785	0.923	2.3215	
30 minute summer	MH55	PN38	MH56	-216.1	-1.001	-1.986	4.1353	
15 minute summer	MH66	PN49	MH49	401.4	1.609	0.581	22.1207	
30 minute summer	MH60	PN43	MH55	-82.7	-1.175	-0.786	2.6628	
30 minute winter	MH51	PN35	MH52	393.6	1.188	0.034	1.3164	
30 minute summer	MH52	1.010	UU 2403	318.5	4.524	2.870	2.3130	564.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 98.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH53	12	37.882	1.542	97.3	5.5470	0.0000	SURCHARGED
15 minute summer	MH54	11	37.312	1.892	580.9	6.0742	0.0000	SURCHARGED
15 minute summer	MH48	11	37.179	1.859	717.7	9.4161	0.0000	SURCHARGED
15 minute summer	MH49	11	36.958	2.148	1052.0	4.9586	0.0000	SURCHARGED
15 minute summer	MH59	12	37.398	1.728	413.4	3.0532	0.0000	SURCHARGED
15 minute summer	MH58	12	37.517	1.807	427.1	3.1922	0.0000	FLOOD RISK
15 minute summer	MH50	11	36.362	2.196	995.9	3.8795	0.0000	SURCHARGED
15 minute summer	MH56	11	37.567	1.777	525.9	21.6208	2.0547	FLOOD
15 minute summer	MH55	11	37.503	1.703	216.1	3.0092	13.9822	FLOOD
15 minute summer	MH66	11	37.401	1.801	377.9	15.8389	0.0000	FLOOD RISK
30 minute summer	MH60	18	37.249	1.109	82.7	1.9596	17.2303	FLOOD
30 minute winter	MH51	17	35.800	2.824	868.7	4.9900	215.3934	FLOOD
60 minute summer	MH52	31	35.790	5.370	322.4	9.4888	0.4661	FLOOD
15 minute summer	UU 2403	8	32.544	0.284	318.5	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 summer	MH53	PN36	MH54	86.5	1.257	0.720	5.5454	
15 minute summer	MH54	PN37	MH48	478.3	1.713	1.295	9.6984	
15 minute summer	MH48	PN32	MH49	659.3	1.943	0.656	33.9100	
15 minute summer	MH49	PN33	MH50	995.9	2.382	0.988	31.5509	
15 minute summer	MH59	PN42	MH54	394.4	1.826	0.878	6.2917	
15 minute summer	MH58	PN41	MH59	413.4	1.914	2.600	7.8528	
15 minute summer	MH50	PN34	MH51	1004.8	3.245	0.629	31.4167	
15 minute summer	MH56	PN40	MH58	427.1	1.977	1.022	2.3215	
15 minute summer	MH55	PN38	MH56	-216.1	-1.000	-1.986	4.1353	
15 minute summer	MH66	PN49	MH49	365.9	1.583	0.530	22.1207	
30 minute summer	MH60	PN43	MH55	-82.7	-1.175	-0.786	2.6628	
30 minute winter	MH51	PN35	MH52	376.3	1.320	0.033	1.3164	
60 minute summer	MH52	1.010	UU 2403	318.5	4.524	2.870	2.3130	785.5

Results for 100 year +45% CC 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
15 minute summer	MH53	10	38.208	1.868	141.1	6.7211	6.3579	FLOOD
15 minute summer	MH54	10	37.649	2.229	565.6	7.1551	0.0000	SURCHARGED
15 minute winter	MH48	10	37.561	2.241	774.1	11.3480	0.0000	SURCHARGED
15 minute summer	MH49	10	37.269	2.459	1106.5	5.6757	0.0000	SURCHARGED
15 minute winter	MH59	10	37.607	1.937	359.3	3.4227	0.0000	FLOOD RISK
15 minute winter	MH58	10	37.574	1.864	399.0	3.2931	0.0000	FLOOD RISK
15 minute winter	MH50	10	36.555	2.389	1093.7	4.2222	0.0000	SURCHARGED
15 minute summer	MH56	9	37.567	1.777	762.5	21.6208	84.0749	FLOOD
30 minute winter	MH55	16	37.503	1.703	216.9	3.0092	43.2420	FLOOD
15 minute summer	MH66	10	37.490	1.890	548.0	16.6207	22.5587	FLOOD
30 minute winter	MH60	16	37.249	1.109	82.7	1.9596	37.6092	FLOOD
60 minute winter	MH51	27	35.800	2.824	893.6	4.9900	455.6052	FLOOD
15 minute summer	MH52	9	35.786	5.366	318.5	9.4815	0.0000	FLOOD RISK
15 minute summer	UU 2403	7	32.544	0.284	318.5	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 summer	MH53	PN36	MH54	99.9	1.419	0.832	5.5454	
15 minute summer	MH54	PN37	MH48	466.3	1.666	1.262	9.6984	
15 minute winter	MH48	PN32	MH49	696.9	1.949	0.694	33.9100	
15 minute summer	MH49	PN33	MH50	1086.4	2.469	1.077	31.5509	
15 minute winter	MH59	PN42	MH54	332.9	1.541	0.742	6.2917	
15 minute winter	MH58	PN41	MH59	359.3	1.663	2.259	7.8528	
15 minute winter	MH50	PN34	MH51	1079.2	3.056	0.675	31.4167	
15 minute summer	MH56	PN40	MH58	462.1	2.139	1.106	2.3215	
30 minute winter	MH55	PN38	MH56	-216.9	-1.004	-1.993	4.1353	
15 minute summer	MH66	PN49	MH49	405.1	1.728	0.587	22.1207	
30 minute winter	MH60	PN43	MH55	-82.7	-1.175	-0.786	2.6628	
60 minute winter	MH51	PN35	MH52	336.1	1.428	0.029	1.3164	
15 minute summer	MH52	1.010	UU 2403	318.5	4.524	2.870	2.3130	422.8