

Technical Note

To: Liverpool Football Club

From: Curtins Liverpool

Subject: Drainage Strategy Statement

Reference: 088269-CUR-XX-XX-T-C-00002

Date: 18 December 2025

Revision: P02

Surface Water Drainage:

Curtins have been appointed by Liverpool Football Club to prepare a Drainage Strategy Technical Note. This is to support a planning application for the extension and refurbishment of an existing sports training facility, located off The Liverpool Way, Liverpool L33 7ED.

The aim of this technical note is to summarise the design principles for the proposed drainage strategy. The associated documents in relation to the proposed drainage strategy are noted below.

Associated documents:

- 088269-CUR-XX-XX-DR-C-91000_ProposedLevels
- 088269-CUR-XX-XX-DR-C-92000_ProposedDrainage
- 088269-CUR-XX-XX-DR-C-92801_DrainageDetails
- 088269-CUR-XX-XX-DR-C-92802_DrainageDetails
- 088269-CUR-XX-XX-CA-C-92000_HydraulicCalculations
- 088269-CUR-XX-XX-T-C-00001_FloodRiskAssessment

The proposed surface water strategy is subject to a climate change factor relative to a respective storm period suitable for the site's hydrological catchment (Alt and Crossens Management), in accordance with the latest EA guidance. For this development, the climate change allowance is 40% and 45% for the 1 in 30 and 1 in 100-year respective storm events.

Surface Water modelled for the following return periods;

- 1 in 2 year
- 1 in 30 year
- 1 in 30 year + 40% Climate Change
- 1 in 100 year
- 1 in 100 year + 45% Climate Change

Maximum Rainfall: 50 mm/h

Rainfall Model: FSR

The most appropriate method of surface water discharge has been determined based on the hierarchy of surface water disposal set out in Building Regulations – Approved Document H.

× **Infiltration**

Soakaway testing conducted during the most recent site investigation has shown no evidence of infiltration, and as such, this method will be excluded as a viable option for surface water discharge.

× **Watercourse**

Although the Kirkby Brook lies approximately 700 m north of the site, it has been deemed unsuitable for discharge; therefore, no viable watercourses are available within the site's vicinity for surface water disposal.

✓ **Surface Water Sewer**

SW drainage across the site is split between three systems, each discharging to separate outfalls. Runoff from the academy building, internal roads, and car parking areas is directed to an onsite attenuation and rainwater harvesting tank located in the southeastern corner of the site, which then discharges into UU manhole 2401.

In contrast, surface water from the existing show pitch is conveyed to a non-operational adjacent partial infiltration system, which ultimately connects to UU manhole 1404 situated beyond the southeastern site boundary. Finally, the building adjacent to the show pitch, along with the associated hardscaping areas, discharge into an onsite private surface water sewer flowing north.

× **Combined Water Sewers**

There is no onsite combined water sewer suitable for discharge.

Summary

Following the assessment of the hierarchy of surface water disposal, the proposed surface water is to discharge into one of the **existing private surface water network** on site, suitable for the proposed locations.

This technical note should be read alongside 088269-CUR-XX-XX-T-C-00001_FRA, which outlines the flood risk and associated mitigation measures incorporated into the proposed drainage strategy.

Drainage Principles

The surface water system accommodates surface water flows up to the 1 in 100 year + 45% Climate Change storm event in accordance with the latest EA guidance.

In consultation with UU and the LLFA, a suitable discharge rate to any sewer (or watercourse) is to be pre-agreed. At the time of writing, the LLFA advised the site can be considered brownfield, and a maximum discharge rate should achieve a 50% betterment to the existing discharge rate based on the current impermeable areas. Discussions around the drainage principles remain ongoing with other statutory bodies including a predevelopment enquiry with the local water authority.

The site incorporates a comprehensive rainwater harvesting system that collects water in an onsite tank located at the southern end of the site for redistribution. Refer to 088269-CUR-XX-XX-DR-C-92000_ProposedDrainage for reference. This system will remain unchanged and has been excluded from all hydraulic calculations used in the design of the proposed drainage strategy.

A S106 agreement (Water Industry Act) will be required for the outfall connection with the contractor needing to prove their competency to work on UU assets as required.

Sustainable Drainage

The four pillars of “Sustainable Urban Drainage Systems” should be a consideration for any new development. These include water quantity, water quality, biodiversity and amenity which are discussed below.

Water Quantity

The overall site area for the development is 5.97ha. The total impermeable area with the boundary is approximately 3.83ha.

The existing surface water discharge rate for the proposed boundary was calculated as **318.5l/s**. Based on the pre consultation advice; the proposed drainage strategy will be restricted to a maximum surface water discharge rate of **159.2l/s** up to the **1 in 100 + 45% climate change** storm.

With reference to 088269-CUR-XX-XX-CA-C-92000_HydraulicCalculations, the proposed drainage strategy is currently restricted to **145.9l/s**, which positively less than the permitted 159.2l/s.

With consideration for maximum 145.9l/s discharge rate, approximately 1700m³ of attenuation is required for the development up to the 1 in 100 + climate change storm. This will be achieved via a variety of storage devices such as, geocellular tanks, large diameter pipes, permeable paving and detention basins where possible. All attenuation systems are subject to detailed design.

It should be noted that the proposed SW drainage serving the proposed stand building discharges into an existing network with flow restriction and attenuation with capacity available to the north for this minor increase in area, thus is excluded from the above restricted discharge.

Water Quality

The SuDS features will be located across the development to ensure that the quality of any receiving water body is not adversely affected and preferably enhanced in accordance with Ciria SuDS Manual C753.

SuDS features including detention basins and permeable paving will be utilised on site to provide treatment to incoming flows relative to the potential pollution risk. The recommended approach for assessing water quality risk management is given in the SuDS Manual C753 Table 26.1. The Simple Index Approach has been used to assess SuDS suitability for water quality.

Pollution hazard indices are given for different land uses in Table 26.2 of the SuDS Manual C753. The table highlights pollution hazard level relative to the proposed land use.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial / industrial roofs)	Low	0.3	0.2	0.05
Non-residential car parking with infrequent change (e.g., schools)	Low	0.5	0.4	0.4

The below table presents the mitigation indices provided by each SuDS method proposed as part of the drainage strategy. The figures given are as set out in Table 26.3 of the SuDS Manual C753 (for surface water).

SuDS Measure	TSS	Metals	Hydrocarbons
Detention Basin	0.5	0.5	0.6
Permeable Pavement	0.7	0.6	0.7

Biodiversity and Amenity

Biodiversity and amenity are achieved by the incorporation of multi-functionality, visual enhancing SuDS, whilst incorporating SuDS to support diverse habitats and ecosystems. The incorporation of the proposed SuDS within the scheme including detention basins and permeable paving help to achieve biodiversity and amenity requirements.

Proposed Foul Drainage

Both the academy and existing show pitch buildings discharge foul water into the same FW below ground system, which flows southeast and discharge into UU manhole 2402.

The proposed foul network will discharge into the existing FW network at an unrestricted rate. All proposed FW connections will discharge into this existing system across various locations within the site. Initial designs confirm the network can be achieved via gravity, subject to further detailed design - refer to 088269-CUR-XX-XX-DR-C-92000_ProposedDrainage.

Discussions around the drainage principles remain ongoing with other statutory bodies including a predevelopment enquiry with the local water authority.

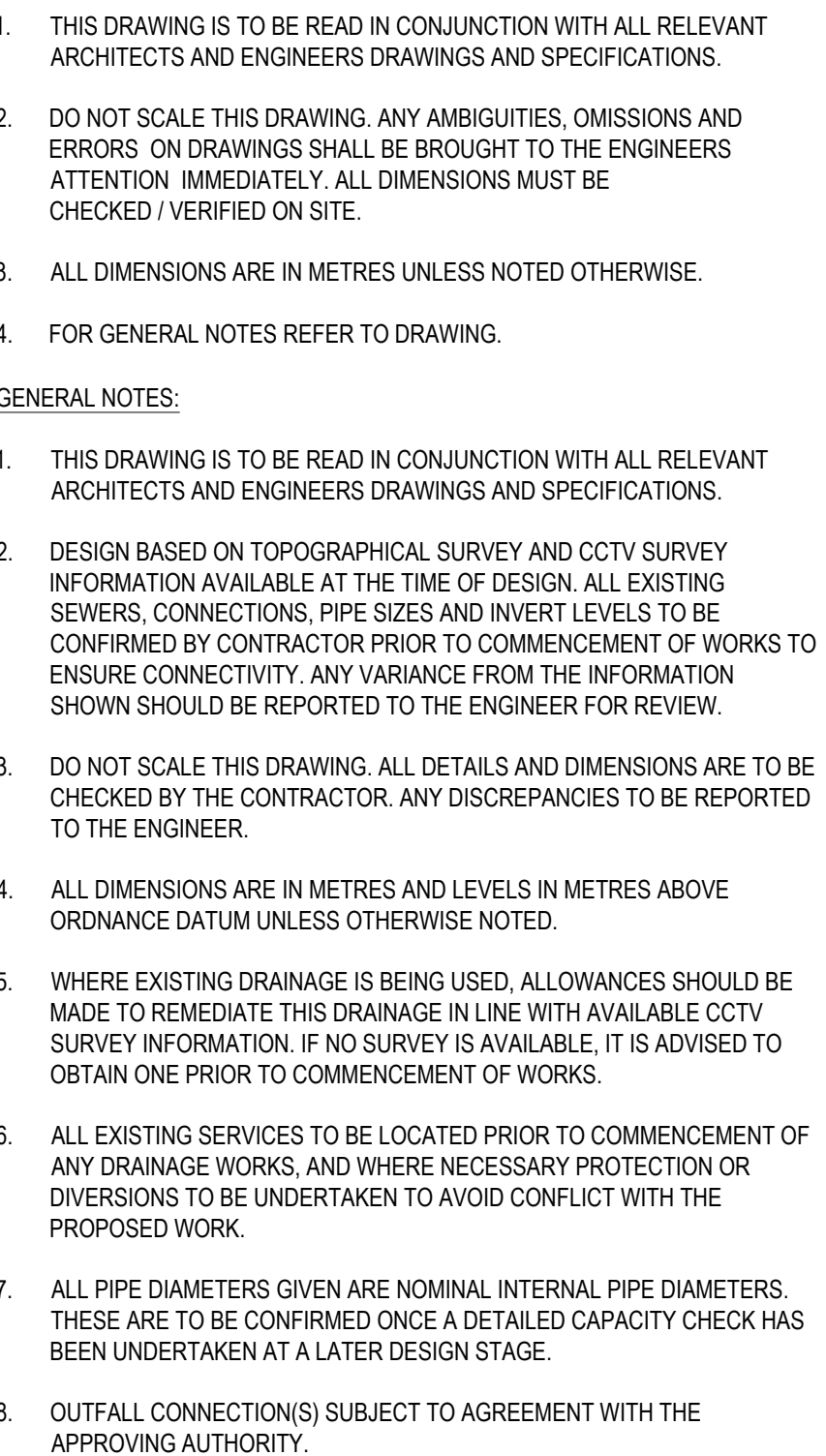
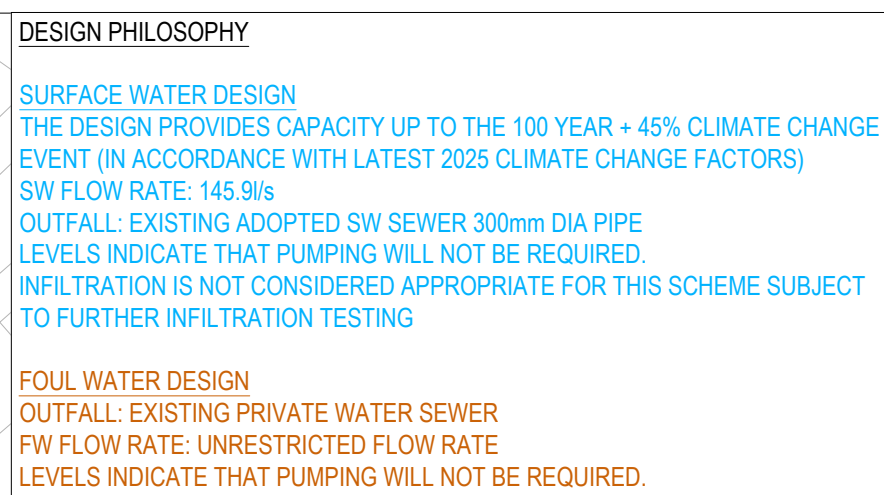
A S106 agreement (Water Industry Act) will be required for the outfall connection with the contractor needing to prove their competency to work on UU assets as required.

Existing Private Drainage Diversion

The GPR Survey confirms there are two existing private drains which will need to be diverted as a result of the development proposals. Firstly, an existing foul water sewer which clashes with the location of the proposed stand building.

Secondly, an existing surface water sewer located south of the site clashes with both the proposed new pitch location and road. It should be noted that the GPR survey suggests the latter is an asset from the adjacent building which discharges through the proposed site. For both diversions, refer to 088269-CUR-XX-XX-DR-C-92000_ProposedDrainage for further detail.

Further investigation is required to confirm this. The flow and existing catchments of both diverted sewers will remain as existing.



	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED FOUL WATER DRAINAGE
	EXISTING PRIVATE SURFACE WATER
	EXISTING PRIVATE FOUL WATER
	DIVERTED EXISTING PRIVATE SURFACE WATER
	DIVERTED EXISTING PRIVATE FOUL WATER
	EXISTING ADOPTED SURFACE WATER
	EXISTING ADOPTED FOUL WATER
	EXISTING DRAINAGE TO BE REMOVED
	PROPOSED SURFACE DRAINAGE CHANNEL
	PROPOSED SURFACE WATER ATTENUATION TANK
	PROPOSED PERMEABLE PAVING

P03	STAGE 3 ISSUE	16/02/25	RIT	MB
P02	STAGE 3 ISSUE	05/12/25	RIT	MB
P01	ISSUED FOR PLANNING (S2)	25/11/25	RIT	MB
Rev:	Description:	Date:	By:	Chkd:



Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer

Status: [REDACTED]

STAGE 3

Project:

LIVERPOOL FC TRAINING CENTRE ACADEMY

Org Title:

Drawn By RIT	Designed By RIT	Checked By JDB
	Date 25/11/2025	Scales @ A1 1:500
Project No - Originator - Function - Spatial - Form - Discipline - Number		Revision

088269 - CUR - XX - XX- DR- C- 92000	P03
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Curtins		Curtins Consulting Ltd	Network: SW Veronika Olchowski-Mrozik 18/12/2025		Page 1		
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)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1		5.00	37.249	1500	342310.909	398548.369	1.109
2			37.503	1500	342339.773	398572.796	1.703
3			37.567	1500	342351.985	398558.055	1.777
4			37.734	1500	342361.025	398545.186	2.024
5			37.901	1500	342385.596	398518.398	2.231
6	0.171	5.00	38.208	1500	342455.465	398436.212	1.868
7	0.193	5.00	38.095	1500	342404.570	398496.303	2.675
8	0.442	5.00	38.001	1500	342378.175	398474.195	2.681
9	0.664	5.00	37.490	1500	342368.731	398366.140	1.890
SW14	0.085	5.00	37.891	1500	342327.904	398414.195	2.893
11			37.952	1500	342317.996	398426.083	3.142
SW1	0.071	5.00	38.045	900	342371.361	398478.938	1.450
SW2	0.239	5.00	37.873	900	342369.390	398474.414	1.290
SW3			37.850	900	342359.967	398466.161	1.298
SW4			37.825	900	342337.969	398447.190	1.346
SW5			38.312	900	342327.652	398437.123	1.869
SW6			38.250	900	342307.781	398420.581	1.871
SW7	0.270	5.00	37.935	900	342275.406	398392.462	1.662
SW8			37.979	2100	342272.980	398388.421	3.635
SW9	0.071	5.00	37.865	1200	342316.838	398542.010	1.800
SW10	0.183	5.00	36.389	1200	342295.282	398523.609	2.125
SW11	0.178	5.00	36.391	1350	342257.324	398491.295	2.252
SW12	0.184	5.00	36.424	1500	342215.447	398455.737	2.422
SW13	0.071	5.00	36.424	1800	342225.998	398442.299	2.765
25			37.143	1500	342216.379	398434.079	4.167
26			37.067	1500	342213.950	398435.824	6.647
26_OUT			33.747	1200	342195.872	398463.649	1.487
SW15	0.082	5.00	38.584	900	342472.233	398584.181	0.697
SW16			38.400	900	342454.849	398606.348	0.750
28_OUT			39.036	1500	342445.724	398622.995	1.709
EXS3	0.924	5.00	37.680	1500	342357.587	398563.523	1.650
Flow+ v15.0 Copyright © 1988-2025 Causeway Technologies Ltd							

Links

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	1	2	37.813	0.600	36.140	35.800	0.340	111.2	300	5.42	50.0
1.001	2	3	19.142	0.600	35.800	35.790	0.010	1914.2	525	6.06	50.0
1.003	3	4	10.746	0.600	35.790	35.710	0.080	134.3	525	6.15	50.0
1.004	4	5	36.350	0.600	35.710	35.670	0.040	908.8	525	6.98	50.0
1.005	5	7	29.124	0.600	35.670	35.420	0.250	116.5	525	7.21	50.0
2.000	6	7	78.748	0.600	36.340	35.420	0.920	85.6	300	5.77	50.0
2.001	7	8	34.431	0.600	35.420	35.320	0.100	344.3	600	7.97	50.0
1.006	8	11	77.047	0.600	35.320	34.810	0.510	151.1	750	8.53	50.0
4.000	9	SW14	63.057	0.600	35.600	34.998	0.602	104.7	600	5.44	50.0
4.001	SW14	11	15.476	0.600	34.998	34.960	0.038	407.3	600	5.66	50.0
1.007	11	SW8	58.693	0.600	34.810	34.419	0.391	150.0	750	8.96	50.0
5.000	SW1	SW2	4.935	0.600	36.595	36.583	0.012	400.0	450	5.08	50.0
5.001	SW2	SW3	12.526	0.600	36.583	36.552	0.031	400.0	450	5.29	50.0
5.002	SW3	SW4	29.048	0.600	36.552	36.479	0.073	400.0	450	5.77	50.0
5.003	SW4	SW5	14.415	0.600	36.479	36.443	0.036	400.4	450	6.01	50.0
5.004	SW5	SW6	25.855	0.600	36.443	36.379	0.064	404.0	450	6.43	50.0
5.005	SW6	SW7	42.881	0.600	36.379	36.273	0.106	404.5	450	7.15	50.0
5.006	SW7	SW8	4.713	0.600	36.273	36.037	0.236	20.0	450	7.16	50.0
1.008	SW8	SW13	71.485	0.600	34.344	33.688	0.656	109.0	825	9.38	50.0
6.000	SW9	SW10	28.342	0.600	36.065	34.889	1.176	24.1	300	5.15	50.0
6.001	SW10	SW11	49.850	0.600	34.264	34.139	0.125	400.0	525	5.89	50.0
6.002	SW11	SW12	54.937	0.600	34.139	34.002	0.137	400.0	525	6.72	50.0
6.003	SW12	SW13	17.085	0.600	34.002	33.959	0.043	400.0	525	6.97	50.0
1.009	SW13	25	12.653	0.600	33.659	33.627	0.032	400.0	825	9.52	50.0

Name	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)
1.000	1.490	105.3	0.0	0.809	1.403	0.000	0.0	0	0.000
1.001	0.503	108.8	0.0	1.178	1.252	0.000	0.0	0	0.000
1.003	1.931	417.9	0.0	1.252	1.499	0.000	0.0	0	0.000
1.004	0.735	159.0	0.0	1.499	1.706	0.000	0.0	0	0.000
1.005	2.074	449.0	0.0	1.706	2.150	0.000	0.0	0	0.000
2.000	1.700	120.2	30.9	1.568	2.375	0.171	0.0	103	1.432
2.001	1.306	369.4	232.7	2.075	2.081	1.288	0.0	346	1.377
1.006	2.274	1004.7	312.6	1.931	2.392	1.730	0.0	286	2.020
4.000	2.379	672.6	120.0	1.290	2.293	0.664	0.0	170	1.819
4.001	1.200	339.3	135.3	2.293	2.392	0.749	0.0	263	1.135
1.007	2.282	1008.3	448.0	2.392	2.810	2.479	0.0	350	2.218
5.000	1.010	160.7	12.8	1.000	0.840	0.071	0.0	85	0.611
5.001	1.010	160.7	56.0	0.840	0.848	0.310	0.0	183	0.923
5.002	1.010	160.7	56.0	0.848	0.896	0.310	0.0	183	0.923
5.003	1.010	160.6	56.0	0.896	1.419	0.310	0.0	183	0.923
5.004	1.005	159.8	56.0	1.419	1.421	0.310	0.0	183	0.919
5.005	1.004	159.7	56.0	1.421	1.212	0.310	0.0	183	0.918
5.006	4.561	725.5	104.8	1.212	1.492	0.580	0.0	115	3.289
1.008	2.843	1519.9	552.8	2.810	1.911	3.059	0.0	343	2.628
6.000	3.215	227.3	12.8	1.500	1.200	0.071	0.0	48	1.758
6.001	1.114	241.0	45.9	1.600	1.727	0.254	0.0	154	0.865
6.002	1.114	241.0	78.1	1.727	1.897	0.432	0.0	205	0.998
6.003	1.114	241.0	111.3	1.897	1.940	0.616	0.0	250	1.092
1.009	1.478	790.1	676.9	1.940	2.691	3.746	0.0	592	1.650

Links

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)
1.010	25	26	2.991	0.600	32.976	30.420	2.556	1.2	750	9.52	50.0
1.011	26	26_OUT	33.182	0.600	32.591	32.260	0.331	100.2	300	9.87	50.0
7.000	SW15	SW16	28.171	0.600	37.887	37.700	0.187	150.6	225	5.44	50.0
7.001	SW16	28_OUT	18.984	0.600	37.650	37.327	0.323	58.8	225	5.63	50.0
2.000_1	EXS3	7	82.012	0.600	36.030	35.970	0.060	1366.9	450	7.53	50.0

Name	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)
1.010	25.977	11476.1	676.9	3.417	5.897	3.746	0.0	121	14.590
1.011	1.570	111.0	676.9	4.176	1.187	3.746	0.0	300	1.590
7.000	1.063	42.3	14.8	0.472	0.475	0.082	0.0	92	0.971
7.001	1.709	67.9	14.8	0.525	1.484	0.082	0.0	71	1.370
2.000_1	0.541	86.0	167.0	1.200	1.675	0.924	0.0	450	0.548

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)
1.000	37.813	111.2	300	Circular	37.249	36.140	0.809	37.503	35.800	1.403
1.001	19.142	1914.2	525	Circular	37.503	35.800	1.178	37.567	35.790	1.252
1.003	10.746	134.3	525	Circular	37.567	35.790	1.252	37.734	35.710	1.499
1.004	36.350	908.8	525	Circular	37.734	35.710	1.499	37.901	35.670	1.706
1.005	29.124	116.5	525	Circular	37.901	35.670	1.706	38.095	35.420	2.150
2.000	78.748	85.6	300	Circular	38.208	36.340	1.568	38.095	35.420	2.375
2.001	34.431	344.3	600	Circular	38.095	35.420	2.075	38.001	35.320	2.081
1.006	77.047	151.1	750	Circular	38.001	35.320	1.931	37.952	34.810	2.392
4.000	63.057	104.7	600	Circular	37.490	35.600	1.290	37.891	34.998	2.293
4.001	15.476	407.3	600	Circular	37.891	34.998	2.293	37.952	34.960	2.392
1.007	58.693	150.0	750	Circular	37.952	34.810	2.392	37.979	34.419	2.810
5.000	4.935	400.0	450	Circular	38.045	36.595	1.000	37.873	36.583	0.840
5.001	12.526	400.0	450	Circular	37.873	36.583	0.840	37.850	36.552	0.848
5.002	29.048	400.0	450	Circular	37.850	36.552	0.848	37.825	36.479	0.896
5.003	14.415	400.4	450	Circular	37.825	36.479	0.896	38.312	36.443	1.419

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1500	Manhole	Adoptable	2	1500	Manhole	Adoptable
1.001	2	1500	Manhole	Adoptable	3	1500	Manhole	Adoptable
1.003	3	1500	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.004	4	1500	Manhole	Adoptable	5	1500	Manhole	Adoptable
1.005	5	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.000	6	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.001	7	1500	Manhole	Adoptable	8	1500	Manhole	Adoptable
1.006	8	1500	Manhole	Adoptable	11	1500	Manhole	Adoptable
4.000	9	1500	Manhole	Adoptable	SW14	1500	Manhole	Adoptable
4.001	SW14	1500	Manhole	Adoptable	11	1500	Manhole	Adoptable
1.007	11	1500	Manhole	Adoptable	SW8	2100	Manhole	Adoptable
5.000	SW1	900	Manhole	Adoptable	SW2	900	Manhole	Adoptable
5.001	SW2	900	Manhole	Adoptable	SW3	900	Manhole	Adoptable
5.002	SW3	900	Manhole	Adoptable	SW4	900	Manhole	Adoptable
5.003	SW4	900	Manhole	Adoptable	SW5	900	Manhole	Adoptable

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.004	SW5	900	Manhole	Adoptable	SW6	900	Manhole	Adoptable
5.005	SW6	900	Manhole	Adoptable	SW7	900	Manhole	Adoptable
5.006	SW7	900	Manhole	Adoptable	SW8	2100	Manhole	Adoptable
1.008	SW8	2100	Manhole	Adoptable	SW13	1800	Manhole	Adoptable
6.000	SW9	1200	Manhole	Adoptable	SW10	1200	Manhole	Adoptable
6.001	SW10	1200	Manhole	Adoptable	SW11	1350	Manhole	Adoptable
6.002	SW11	1350	Manhole	Adoptable	SW12	1500	Manhole	Adoptable
6.003	SW12	1500	Manhole	Adoptable	SW13	1800	Manhole	Adoptable
1.009	SW13	1800	Manhole	Adoptable	25	1500	Manhole	Adoptable
1.010	25	1500	Manhole	Adoptable	26	1500	Manhole	Adoptable
1.011	26	1500	Manhole	Adoptable	26_OUT	1200	Manhole	Adoptable
7.000	SW15	900	Manhole	Adoptable	SW16	900	Manhole	Adoptable
7.001	SW16	900	Manhole	Adoptable	28_OUT	1500	Manhole	Adoptable
2.000_1	EXS3	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable

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

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

Node SW8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	34.344	Product Number	CTL-SHE-0369-1000-2900-1000
Design Depth (m)	2.900	Min Outlet Diameter (m)	0.450
Design Flow (l/s)	100.0	Min Node Diameter (mm)	0

Node SW13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	33.659	Product Number	CTL-SHE-0440-1450-2700-1450
Design Depth (m)	2.700	Min Outlet Diameter (m)	0.500
Design Flow (l/s)	145.0	Min Node Diameter (mm)	0

Node SW14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.998
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	160

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	720.0	720.0	1.800	720.0	891.2	1.801	0.0	891.2

Node EXS3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	36.030
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	15

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	225.0	225.0	1.000	225.0	278.2	1.001	0.0	278.2

Node SW12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.002
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	40

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	190.0	190.0	1.100	190.0	243.7	1.101	0.0	243.7

Node SW16 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	5.3	5.3	0.750	48.5	50.2	0.751	0.0	50.2

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2	1	35.800	0.000	0.0	0.0000	0.0000	OK
15 minute summer	3	1	35.790	0.000	0.0	0.0000	0.0000	OK
15 minute summer	4	1	35.710	0.000	0.0	0.0000	0.0000	OK
30 minute summer	5	20	35.672	0.002	0.0	0.0040	0.0000	OK
15 minute summer	6	10	36.456	0.116	39.5	0.4159	0.0000	OK
30 minute summer	7	19	35.671	0.251	126.8	0.8048	0.0000	OK
15 minute summer	8	10	35.545	0.225	210.1	1.1389	0.0000	OK
15 minute summer	9	9	35.861	0.261	153.4	2.2948	0.0000	OK
60 minute summer	SW14	49	35.251	0.253	268.8	173.4304	0.0000	OK
15 minute summer	11	13	35.370	0.560	242.8	0.9897	0.0000	OK
15 minute summer	SW1	11	36.818	0.223	16.4	0.3599	0.0000	OK
15 minute summer	SW2	11	36.817	0.234	71.2	1.0147	0.0000	OK
15 minute summer	SW3	11	36.775	0.223	69.8	0.1421	0.0000	OK
15 minute summer	SW4	11	36.710	0.231	69.7	0.1469	0.0000	OK
15 minute summer	SW5	11	36.664	0.221	69.5	0.1403	0.0000	OK
15 minute summer	SW6	11	36.587	0.208	68.8	0.1321	0.0000	OK
15 minute summer	SW7	11	36.438	0.165	127.0	0.6422	0.0000	OK
30 minute summer	SW8	19	35.395	1.051	179.9	3.6409	0.0000	SURCHARGED
15 minute summer	SW9	10	36.120	0.055	16.4	0.1060	0.0000	OK
15 minute summer	SW10	10	34.439	0.175	58.5	0.4986	0.0000	OK
15 minute summer	SW11	11	34.367	0.228	98.3	0.6880	0.0000	OK
60 minute summer	SW12	42	34.318	0.316	93.8	58.1631	0.0000	OK
60 minute summer	SW13	42	34.317	0.658	132.2	2.0131	0.0000	OK
60 minute summer	25	43	33.060	0.084	130.2	0.1475	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	1	1.000	2	0.0	0.000	0.000	0.0000	
15 minute summer	2	1.001	3	0.0	0.000	0.000	0.0000	
15 minute summer	3	1.003	4	0.0	0.000	0.000	0.0000	
15 minute summer	4	1.004	5	0.0	0.000	0.000	0.0001	
30 minute summer	5	1.005	7	0.0	-0.001	0.000	1.4815	
15 minute summer	6	2.000	7	38.5	0.982	0.320	3.3919	
30 minute summer	7	2.001	8	127.8	1.279	0.346	3.5668	
15 minute summer	8	1.006	11	207.3	1.699	0.206	17.4658	
15 minute summer	9	4.000	SW14	159.5	2.946	0.237	3.8753	
60 minute summer	SW14	4.001	11	-165.8	-1.597	-0.489	1.9213	
15 minute summer	11	1.007	SW8	146.1	0.654	0.145	23.2673	
15 minute summer	SW1	5.000	SW2	15.9	0.198	0.099	0.3983	
15 minute summer	SW2	5.001	SW3	69.8	0.872	0.435	1.0125	
15 minute summer	SW3	5.002	SW4	69.7	0.881	0.434	2.3305	
15 minute summer	SW4	5.003	SW5	69.5	0.874	0.433	1.1472	
15 minute summer	SW5	5.004	SW6	68.8	0.932	0.430	1.9223	
15 minute summer	SW6	5.005	SW7	70.6	1.204	0.442	2.6633	
15 minute summer	SW7	5.006	SW8	125.8	2.850	0.173	0.2088	
30 minute summer	SW8	1.008	SW13	99.9	0.606	0.066	17.2707	
15 minute summer	SW9	6.000	SW10	16.2	1.857	0.071	0.2476	
15 minute summer	SW10	6.001	SW11	57.5	0.755	0.238	3.8017	
15 minute summer	SW11	6.002	SW12	98.4	1.590	0.408	4.4370	
60 minute summer	SW12	6.003	SW13	34.9	0.698	0.145	2.5029	
60 minute summer	SW13	1.009	25	130.2	1.110	0.165	1.4858	
60 minute summer	25	1.010	26	130.1	0.974	0.011	0.6980	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	26	43	33.061	2.641	130.1	4.6665	0.0000	SURCHARGED
60 minute summer	26_OUT	43	32.531	0.271	130.1	0.0000	0.0000	OK
15 minute summer	SW15	10	37.995	0.108	19.0	0.3222	0.0000	OK
15 minute summer	SW16	11	37.734	0.084	18.5	0.6995	0.0000	OK
15 minute summer	28_OUT	11	37.407	0.080	18.5	0.0000	0.0000	OK
60 minute summer	EXS3	38	36.328	0.298	141.2	67.5751	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)
60 minute summer	26	1.011	26_OUT	130.1	1.849	1.173	2.2797	574.5
15 minute summer	SW15	7.000	SW16	18.5	1.016	0.438	0.5133	
15 minute summer	SW16	7.001	28_OUT	18.5	1.420	0.272	0.2470	8.2
60 minute summer	EXS3	2.000_1	7	76.5	0.870	0.890	7.1992	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2	15	35.811	0.011	0.4	0.0194	0.0000	OK
15 minute summer	3	13	35.833	0.043	4.1	0.0758	0.0000	OK
15 minute summer	4	13	35.836	0.126	12.2	0.2222	0.0000	OK
15 minute summer	5	12	35.824	0.154	17.3	0.2729	0.0000	OK
15 minute summer	6	10	36.508	0.168	75.0	0.6035	0.0000	OK
15 minute summer	7	12	35.822	0.402	267.1	1.2898	0.0000	OK
60 minute summer	8	60	35.727	0.407	357.4	2.0599	0.0000	OK
15 minute summer	9	9	35.945	0.345	291.2	3.0376	0.0000	OK
60 minute summer	SW14	61	35.727	0.729	620.2	500.5250	0.0000	SURCHARGED
60 minute summer	11	61	35.726	0.916	425.8	1.6194	0.0000	SURCHARGED
15 minute summer	SW1	11	36.952	0.357	31.2	0.5771	0.0000	OK
15 minute summer	SW2	11	36.951	0.368	135.1	1.5974	0.0000	OK
15 minute summer	SW3	11	36.904	0.352	132.3	0.2240	0.0000	OK
15 minute summer	SW4	11	36.833	0.354	130.6	0.2252	0.0000	OK
15 minute summer	SW5	11	36.778	0.335	130.2	0.2128	0.0000	OK
15 minute summer	SW6	11	36.691	0.312	129.7	0.1983	0.0000	OK
15 minute summer	SW7	11	36.525	0.252	240.9	0.9776	0.0000	OK
60 minute summer	SW8	61	35.723	1.379	164.2	4.7763	0.0000	SURCHARGED
15 minute summer	SW9	10	36.142	0.077	31.2	0.1475	0.0000	OK
60 minute summer	SW10	43	34.563	0.299	73.8	0.8525	0.0000	OK
60 minute summer	SW11	44	34.563	0.424	124.8	1.2773	0.0000	OK
60 minute summer	SW12	44	34.562	0.560	168.9	103.0006	0.0000	SURCHARGED
60 minute summer	SW13	43	34.561	0.902	158.4	2.7585	0.0000	SURCHARGED
60 minute summer	25	51	33.215	0.239	143.2	0.4231	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	1	1.000	2	0.0	0.000	0.000	0.0151	
15 minute summer	2	1.001	3	-0.4	-0.133	-0.004	0.0802	
15 minute summer	3	1.003	4	-4.1	-0.183	-0.010	0.2574	
15 minute summer	4	1.004	5	-12.2	0.391	-0.077	1.5358	
15 minute summer	5	1.005	7	21.0	0.248	0.047	3.3532	
15 minute summer	6	2.000	7	73.7	1.179	0.613	4.3676	
15 minute summer	7	2.001	8	263.5	1.624	0.713	6.5036	
60 minute summer	8	1.006	11	355.7	1.452	0.354	26.3479	
15 minute summer	9	4.000	SW14	301.8	3.241	0.449	8.1034	
60 minute summer	SW14	4.001	11	-409.3	-2.006	-1.206	4.3592	
60 minute summer	11	1.007	SW8	99.0	0.653	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	30.2	0.224	0.188	0.6754	
15 minute summer	SW2	5.001	SW3	132.3	1.003	0.823	1.7024	
15 minute summer	SW3	5.002	SW4	130.6	1.002	0.813	3.8767	
15 minute summer	SW4	5.003	SW5	130.2	1.004	0.811	1.8758	
15 minute summer	SW5	5.004	SW6	129.7	1.064	0.811	3.1495	
15 minute summer	SW6	5.005	SW7	130.8	1.383	0.819	4.4672	
15 minute summer	SW7	5.006	SW8	239.9	3.241	0.331	0.3493	
60 minute summer	SW8	1.008	SW13	100.6	0.606	0.066	23.0720	
15 minute summer	SW9	6.000	SW10	30.9	2.226	0.136	0.3933	
60 minute summer	SW10	6.001	SW11	73.1	0.753	0.303	7.8202	
60 minute summer	SW11	6.002	SW12	115.4	1.050	0.479	11.0679	
60 minute summer	SW12	6.003	SW13	51.4	0.689	0.213	3.6909	
60 minute summer	SW13	1.009	25	143.2	1.138	0.181	1.5947	
60 minute summer	25	1.010	26	259.6	1.128	0.023	0.8396	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	26	49	33.240	2.820	238.5	4.9834	0.0000	SURCHARGED
60 minute summer	26_OUT	44	32.539	0.279	144.2	0.0000	0.0000	OK
15 minute summer	SW15	10	38.052	0.165	36.0	0.4940	0.0000	OK
15 minute summer	SW16	11	37.772	0.122	35.1	1.1590	0.0000	OK
15 minute summer	28_OUT	11	37.441	0.114	35.0	0.0000	0.0000	OK
30 minute summer	EXS3	21	36.537	0.507	362.1	114.9866	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	26	1.011	26_OUT	143.9	2.044	1.297	2.3006	1114.1
15 minute summer	SW15	7.000	SW16	35.1	1.166	0.831	0.8475	
15 minute summer	SW16	7.001	28_OUT	35.0	1.660	0.515	0.4003	15.5
30 minute summer	EXS3	2.000_1	7	169.8	1.157	1.973	10.9269	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	114	36.197	0.057	0.8	0.1004	0.0000	OK
120 minute winter	2	116	36.197	0.397	7.5	0.7008	0.0000	OK
120 minute winter	3	116	36.196	0.406	10.2	0.7177	0.0000	OK
120 minute summer	4	106	36.196	0.486	16.7	0.8596	0.0000	OK
120 minute winter	5	114	36.196	0.526	22.5	0.9299	0.0000	SURCHARGED
15 minute summer	6	11	36.571	0.231	105.0	0.8299	0.0000	OK
120 minute winter	7	114	36.196	0.776	206.8	2.4917	0.0000	SURCHARGED
120 minute winter	8	114	36.194	0.874	277.6	4.4275	0.0000	SURCHARGED
120 minute winter	9	116	36.194	0.594	119.8	5.2195	0.0000	OK
120 minute winter	SW14	116	36.193	1.195	394.1	820.4692	0.0000	SURCHARGED
120 minute winter	11	116	36.193	1.383	277.6	2.4432	0.0000	SURCHARGED
15 minute summer	SW1	11	37.179	0.584	43.6	0.9435	0.0000	SURCHARGED
15 minute summer	SW2	11	37.177	0.594	187.1	2.5776	0.0000	SURCHARGED
15 minute summer	SW3	11	37.103	0.551	182.0	0.3504	0.0000	SURCHARGED
15 minute summer	SW4	11	36.976	0.497	182.0	0.3162	0.0000	SURCHARGED
15 minute summer	SW5	11	36.898	0.455	182.0	0.2894	0.0000	SURCHARGED
15 minute summer	SW6	11	36.791	0.412	181.8	0.2619	0.0000	OK
15 minute summer	SW7	11	36.594	0.321	339.1	1.2480	0.0000	OK
240 minute summer	SW8	208	36.220	1.876	154.3	6.4977	0.0000	SURCHARGED
15 minute summer	SW9	10	36.157	0.092	43.6	0.1763	0.0000	OK
60 minute summer	SW10	46	34.837	0.573	103.4	1.6340	0.0000	SURCHARGED
60 minute summer	SW11	46	34.836	0.697	164.5	2.1008	0.0000	SURCHARGED
60 minute summer	SW12	47	34.835	0.833	217.3	153.0723	0.0000	SURCHARGED
60 minute summer	SW13	47	34.833	1.174	165.4	3.5894	0.0000	SURCHARGED
120 minute summer	25	82	33.243	0.267	145.0	0.4712	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)
120 minute winter	1	1.000	2	-0.8	-0.019	-0.008	1.5064	
120 minute winter	2	1.001	3	-7.5	-0.301	-0.069	3.3914	
120 minute winter	3	1.003	4	-10.2	-0.208	-0.024	2.0851	
120 minute summer	4	1.004	5	-16.7	-0.193	-0.105	7.7206	
120 minute winter	5	1.005	7	-22.5	-0.129	-0.050	6.2897	
15 minute summer	6	2.000	7	101.5	1.515	0.844	5.0617	
120 minute winter	7	2.001	8	197.9	1.465	0.536	9.6984	
120 minute winter	8	1.006	11	269.0	1.326	0.268	33.9100	
120 minute winter	9	4.000	SW14	119.8	1.806	0.178	17.7471	
120 minute winter	SW14	4.001	11	-259.0	-1.118	-0.763	4.3592	
120 minute winter	11	1.007	SW8	99.0	0.654	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	41.7	0.263	0.259	0.7819	
15 minute summer	SW2	5.001	SW3	182.0	1.149	1.133	1.9847	
15 minute summer	SW3	5.002	SW4	182.0	1.149	1.133	4.6025	
15 minute summer	SW4	5.003	SW5	182.0	1.149	1.133	2.2839	
15 minute summer	SW5	5.004	SW6	181.8	1.161	1.137	4.0133	
15 minute summer	SW6	5.005	SW7	180.8	1.455	1.132	5.8552	
15 minute summer	SW7	5.006	SW8	338.5	3.459	0.467	0.4586	
240 minute summer	SW8	1.008	SW13	100.0	0.559	0.066	26.2628	
15 minute summer	SW9	6.000	SW10	43.2	2.439	0.190	0.5022	
60 minute summer	SW10	6.001	SW11	92.1	0.750	0.382	10.7692	
60 minute summer	SW11	6.002	SW12	142.5	1.147	0.591	11.8682	
60 minute summer	SW12	6.003	SW13	69.2	0.698	0.287	3.6909	
60 minute summer	SW13	1.009	25	145.0	1.142	0.184	1.6082	
120 minute summer	25	1.010	26	248.2	0.766	0.022	0.8685	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	26	27	33.259	2.839	257.6	5.0172	0.0000	SURCHARGED
180 minute summer	26_OUT	112	32.539	0.279	146.0	0.0000	0.0000	OK
15 minute summer	SW15	11	38.157	0.270	50.4	0.8074	0.0000	SURCHARGED
15 minute summer	SW16	11	37.801	0.151	48.6	1.5560	0.0000	OK
15 minute summer	28_OUT	11	37.465	0.138	47.6	0.0000	0.0000	OK
30 minute summer	EXS3	22	36.738	0.708	506.9	160.4462	0.0000	SURCHARGED

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	26	1.011	26_OUT	145.7	2.070	1.313	2.3021	1247.9
15 minute summer	SW15	7.000	SW16	48.6	1.241	1.151	1.0491	
15 minute summer	SW16	7.001	28_OUT	47.6	1.773	0.700	0.5105	21.8
30 minute summer	EXS3	2.000_1	7	225.0	1.473	2.615	11.6837	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
120 minute summer	2	106	36.089	0.289	4.3	0.5100	0.0000	OK
120 minute summer	3	106	36.089	0.299	7.6	0.5277	0.0000	OK
120 minute summer	4	106	36.089	0.379	12.5	0.6690	0.0000	OK
120 minute summer	5	106	36.088	0.418	17.8	0.7394	0.0000	OK
15 minute summer	6	10	36.540	0.200	97.3	0.7178	0.0000	OK
120 minute summer	7	106	36.088	0.668	249.0	2.1456	0.0000	SURCHARGED
120 minute summer	8	106	36.086	0.766	344.7	3.8804	0.0000	SURCHARGED
120 minute summer	9	106	36.085	0.485	163.2	4.2673	0.0000	OK
120 minute summer	SW14	106	36.085	1.087	557.9	746.0036	0.0000	SURCHARGED
120 minute summer	11	106	36.085	1.275	369.5	2.2521	0.0000	SURCHARGED
15 minute summer	SW1	11	37.092	0.497	40.4	0.8032	0.0000	SURCHARGED
15 minute summer	SW2	11	37.090	0.507	174.2	2.2023	0.0000	SURCHARGED
15 minute summer	SW3	11	37.028	0.476	168.6	0.3026	0.0000	SURCHARGED
15 minute summer	SW4	11	36.923	0.444	168.3	0.2827	0.0000	OK
15 minute summer	SW5	11	36.858	0.415	168.0	0.2642	0.0000	OK
15 minute summer	SW6	11	36.760	0.381	167.0	0.2422	0.0000	OK
15 minute summer	SW7	11	36.575	0.302	312.5	1.1747	0.0000	OK
120 minute summer	SW8	106	36.081	1.737	141.8	6.0183	0.0000	SURCHARGED
15 minute summer	SW9	10	36.153	0.088	40.4	0.1692	0.0000	OK
60 minute summer	SW10	46	34.772	0.508	97.0	1.4501	0.0000	OK
60 minute summer	SW11	45	34.772	0.633	156.2	1.9067	0.0000	SURCHARGED
60 minute summer	SW12	46	34.771	0.769	207.3	141.2643	0.0000	SURCHARGED
60 minute summer	SW13	45	34.768	1.109	163.6	3.3918	0.0000	SURCHARGED
60 minute summer	25	35	33.240	0.264	145.0	0.4669	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	1	1.000	2	0.0	0.000	0.000	1.0234	
120 minute summer	2	1.001	3	-4.3	-0.280	-0.040	2.3770	
120 minute summer	3	1.003	4	-7.6	-0.167	-0.018	1.5770	
120 minute summer	4	1.004	5	-12.5	-0.173	-0.079	6.3845	
120 minute summer	5	1.005	7	-17.8	-0.111	-0.040	5.8334	
15 minute summer	6	2.000	7	95.7	1.455	0.797	4.7316	
120 minute summer	7	2.001	8	238.3	1.525	0.645	9.6984	
120 minute summer	8	1.006	11	336.2	1.323	0.335	33.9100	
120 minute summer	9	4.000	SW14	163.2	1.712	0.243	16.5793	
120 minute summer	SW14	4.001	11	-373.8	-1.377	-1.102	4.3592	
120 minute summer	11	1.007	SW8	99.0	0.654	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	38.5	0.243	0.240	0.7819	
15 minute summer	SW2	5.001	SW3	168.6	1.068	1.049	1.9847	
15 minute summer	SW3	5.002	SW4	168.3	1.062	1.047	4.5974	
15 minute summer	SW4	5.003	SW5	168.0	1.077	1.046	2.2417	
15 minute summer	SW5	5.004	SW6	167.0	1.126	1.045	3.8262	
15 minute summer	SW6	5.005	SW7	166.9	1.431	1.045	5.4953	
15 minute summer	SW7	5.006	SW8	311.8	3.407	0.430	0.4299	
120 minute summer	SW8	1.008	SW13	100.0	0.564	0.066	28.2634	
15 minute summer	SW9	6.000	SW10	40.0	2.390	0.176	0.4750	
60 minute summer	SW10	6.001	SW11	88.3	0.752	0.366	10.7184	
60 minute summer	SW11	6.002	SW12	137.1	1.127	0.569	11.8682	
60 minute summer	SW12	6.003	SW13	67.1	0.695	0.278	3.6909	
60 minute summer	SW13	1.009	25	145.0	1.142	0.184	1.6082	
60 minute summer	25	1.010	26	235.5	0.919	0.021	0.8658	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	26	43	33.258	2.838	235.5	5.0147	0.0000	SURCHARGED
60 minute winter	26_OUT	57	32.539	0.279	145.9	0.0000	0.0000	OK
15 minute summer	SW15	11	38.116	0.229	46.7	0.6856	0.0000	SURCHARGED
15 minute summer	SW16	11	37.793	0.143	44.6	1.4370	0.0000	OK
15 minute summer	28_OUT	11	37.458	0.131	44.1	0.0000	0.0000	OK
30 minute summer	EXS3	22	36.691	0.661	473.9	149.7760	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	26	1.011	26_OUT	145.8	2.071	1.314	2.3022	1467.0
15 minute summer	SW15	7.000	SW16	44.6	1.217	1.055	1.0312	
15 minute summer	SW16	7.001	28_OUT	44.1	1.747	0.649	0.4798	20.2
30 minute summer	EXS3	2.000_1	7	213.0	1.405	2.475	11.5329	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	116	36.745	0.605	11.9	1.0695	0.0000	SURCHARGED
15 minute summer	2	12	36.765	0.965	77.6	1.7054	0.0000	SURCHARGED
15 minute summer	3	12	36.778	0.988	123.0	1.7457	0.0000	SURCHARGED
15 minute summer	4	12	36.747	1.037	227.7	1.8331	0.0000	SURCHARGED
120 minute winter	5	116	36.745	1.075	58.6	1.9001	0.0000	SURCHARGED
15 minute summer	6	12	37.593	1.253	141.1	4.5085	0.0000	SURCHARGED
120 minute winter	7	116	36.745	1.325	275.4	4.2545	0.0000	SURCHARGED
120 minute winter	8	116	36.743	1.423	348.7	7.2077	0.0000	SURCHARGED
120 minute winter	9	116	36.742	1.142	163.0	10.0464	0.0000	SURCHARGED
120 minute winter	SW14	118	36.743	1.745	526.0	1197.4150	0.0000	SURCHARGED
120 minute winter	11	118	36.742	1.932	374.4	3.4133	0.0000	SURCHARGED
15 minute summer	SW1	11	37.696	1.101	58.6	1.7779	0.0000	SURCHARGED
15 minute summer	SW2	11	37.691	1.108	250.0	4.8119	0.0000	FLOOD RISK
15 minute summer	SW3	11	37.559	1.007	242.8	0.6408	0.0000	FLOOD RISK
15 minute summer	SW4	11	37.333	0.854	242.5	0.5430	0.0000	SURCHARGED
15 minute summer	SW5	11	37.190	0.747	242.3	0.4752	0.0000	SURCHARGED
15 minute summer	SW6	11	36.982	0.603	242.1	0.3833	0.0000	SURCHARGED
120 minute winter	SW7	116	36.739	0.466	142.2	1.8093	0.0000	SURCHARGED
120 minute winter	SW8	116	36.738	2.394	142.2	8.2934	0.0000	SURCHARGED
120 minute winter	SW9	88	36.310	0.245	17.4	0.4695	0.0000	OK
120 minute winter	SW10	88	36.308	2.044	62.3	5.8306	0.0000	FLOOD RISK
120 minute winter	SW11	86	36.310	2.171	103.7	6.5405	0.0000	FLOOD RISK
120 minute winter	SW12	86	36.308	2.306	147.1	206.2205	0.0000	FLOOD RISK
120 minute winter	SW13	84	36.308	2.649	180.3	8.1020	0.0000	FLOOD RISK
60 minute summer	25	34	33.240	0.264	145.0	0.4672	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)
120 minute winter	1	1.000	2	-11.9	-0.231	-0.113	2.6628	
15 minute summer	2	1.001	3	-77.6	-0.359	-0.713	4.1353	
15 minute summer	3	1.003	4	-123.0	-0.996	-0.294	2.3215	
15 minute summer	4	1.004	5	-227.7	-1.102	-1.432	7.8528	
120 minute winter	5	1.005	7	-58.6	-0.276	-0.131	6.2917	
15 minute summer	6	2.000	7	124.6	1.769	1.037	5.5454	
120 minute winter	7	2.001	8	252.5	1.490	0.684	9.6984	
120 minute winter	8	1.006	11	344.7	1.318	0.343	33.9100	
120 minute winter	9	4.000	SW14	162.5	1.944	0.242	17.7617	
120 minute winter	SW14	4.001	11	-372.8	-1.324	-1.099	4.3592	
120 minute winter	11	1.007	SW8	99.0	0.626	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	55.5	0.350	0.346	0.7819	
15 minute summer	SW2	5.001	SW3	242.8	1.533	1.511	1.9847	
15 minute summer	SW3	5.002	SW4	242.5	1.531	1.510	4.6025	
15 minute summer	SW4	5.003	SW5	242.3	1.529	1.509	2.2840	
15 minute summer	SW5	5.004	SW6	242.1	1.528	1.515	4.0966	
15 minute summer	SW6	5.005	SW7	242.0	1.528	1.515	6.6577	
120 minute winter	SW7	5.006	SW8	142.2	2.924	0.196	0.7467	
120 minute winter	SW8	1.008	SW13	117.7	0.597	0.077	38.1110	
120 minute winter	SW9	6.000	SW10	17.4	1.897	0.077	1.8693	
120 minute winter	SW10	6.001	SW11	60.0	0.600	0.249	10.7692	
120 minute winter	SW11	6.002	SW12	101.9	1.057	0.423	11.8682	
120 minute winter	SW12	6.003	SW13	80.8	0.441	0.335	3.6909	
120 minute winter	SW13	1.009	25	145.0	1.142	0.184	1.6082	
60 minute summer	25	1.010	26	258.9	0.785	0.023	0.8657	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	26	144	33.298	2.878	241.5	5.0855	0.0000	SURCHARGED
240 minute summer	26_OUT	192	32.539	0.279	146.0	0.0000	0.0000	OK
15 minute summer	SW15	11	38.400	0.513	67.7	1.5322	0.0000	FLOOD RISK
15 minute summer	SW16	12	37.842	0.192	64.8	2.2051	0.0000	OK
15 minute summer	28_OUT	12	37.496	0.169	62.8	0.0000	0.0000	OK
30 minute summer	EXS3	22	37.510	1.480	687.2	233.0456	0.0000	FLOOD RISK

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	26	1.011	26_OUT	145.9	2.072	1.315	2.3022	2638.8
15 minute summer	SW15	7.000	SW16	64.8	1.630	1.534	1.0950	
15 minute summer	SW16	7.001	28_OUT	62.8	1.841	0.925	0.6462	29.2
30 minute summer	EXS3	2.000_1	7	308.4	1.947	3.584	12.9943	