

Nationwide Produce - Spalding

Proposed Agricultural Development,
Cowper's Gate, Long Sutton,
South Holland, Lincolnshire, PE12 9AY

Drainage & Maintenance Strategy

18th December 2023

T. R. Stafford
Senior Partner

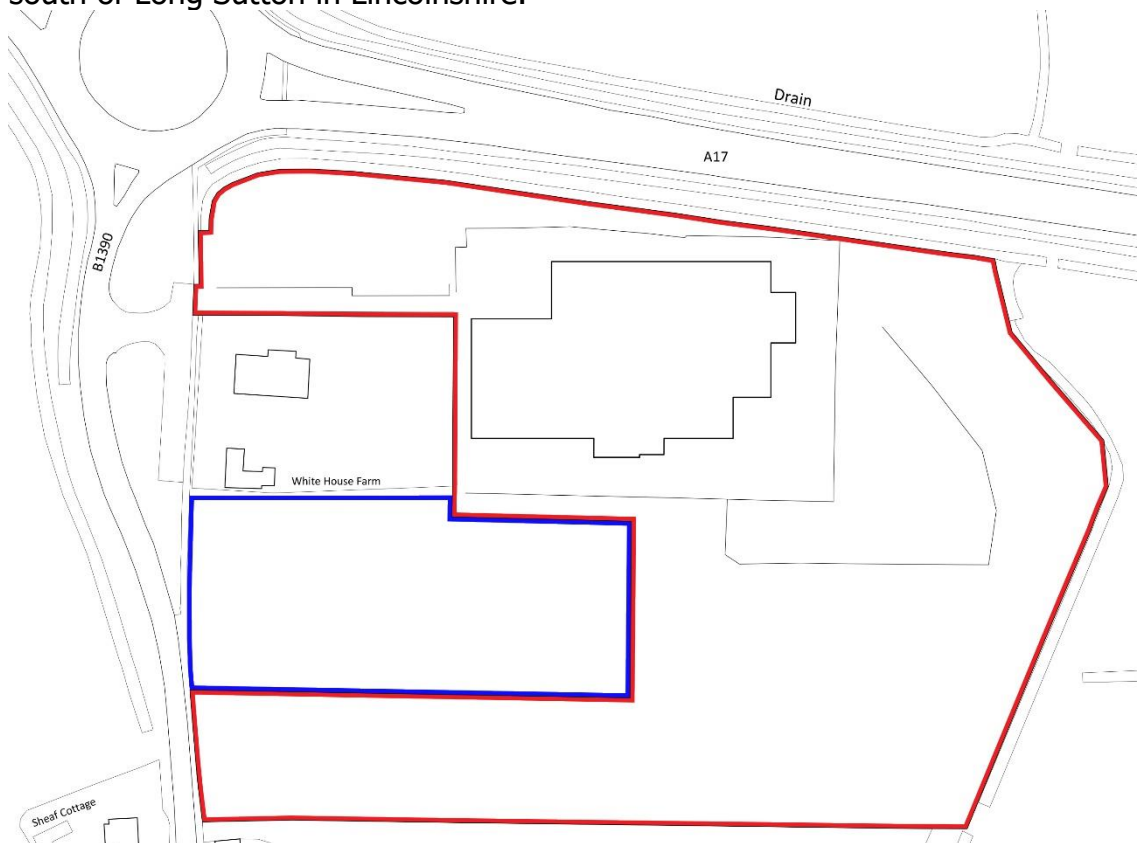
DRAINAGE STRATEGY

SUMMARY

Further to instruction from Nationwide Produce - Spalding, Stafford Infrastructure Engineering [SIE] have undertaken an assessment of the data provided for the infrastructure design on the above site, and following receipt of the topographical site survey, preliminary planning layout 889-8_PL_SP01A and other relevant data, please find below our assessment of the infrastructure design that is proposed for this development.

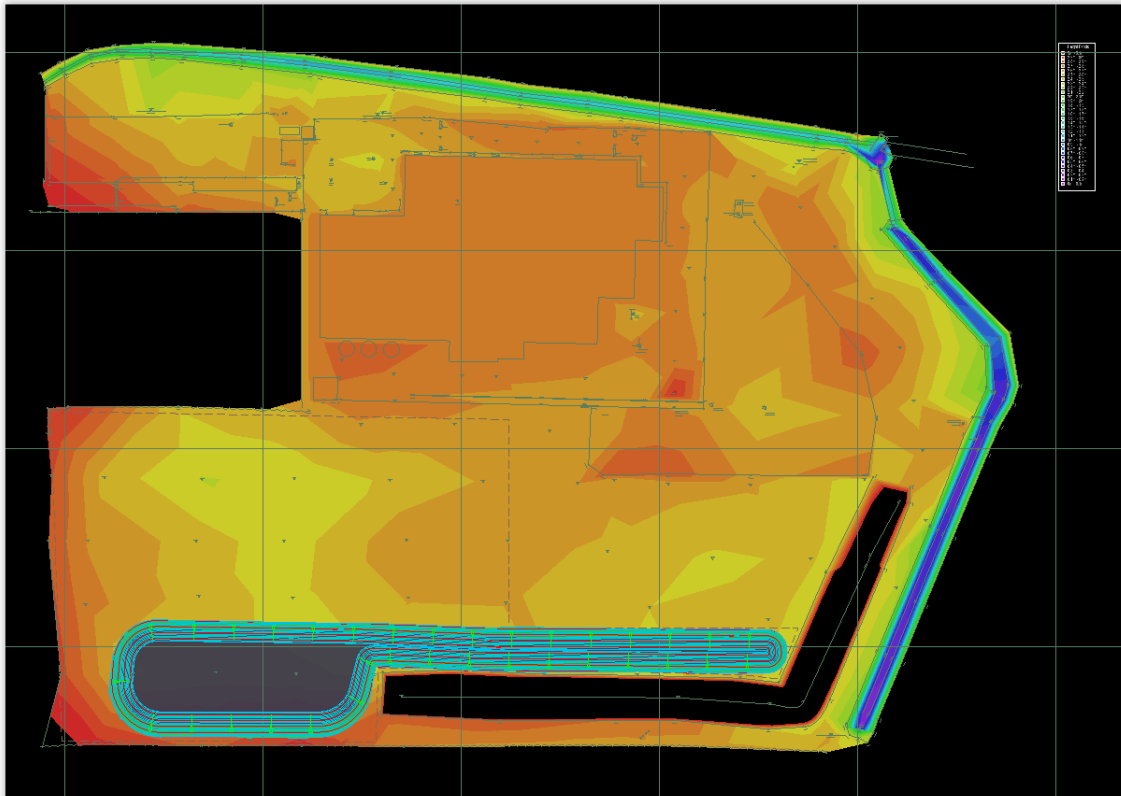
THE SITE

This site [edged Red & Blue] is approximately 3.406ha and sits to the south of The A17 Long Sutton by-pass and to the east of B1390 Cowper's Gate to the south of Long Sutton in Lincolnshire.



Location Plan

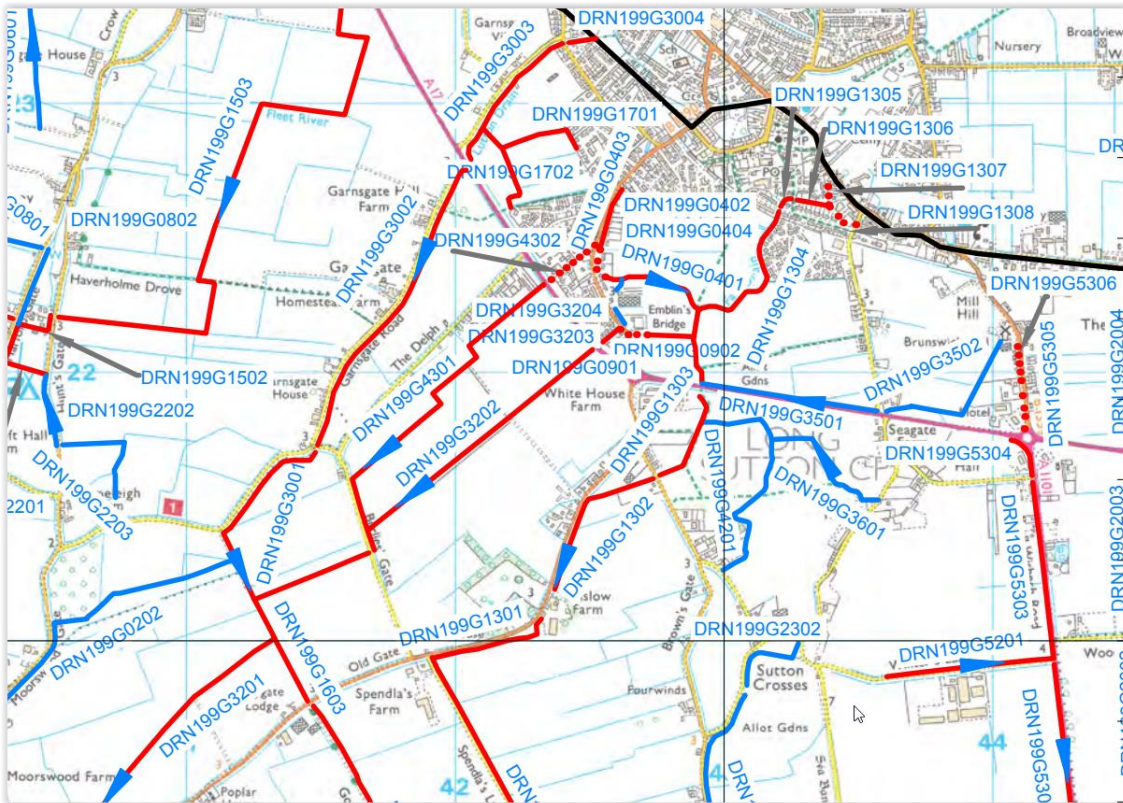
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Coloured survey level drawing with development layout and pond

The site falls slightly from west to east from around 3.0 to 2.4mOD.
The development areas are between 2.8 & 2.5mOD with very slight gradients.

Continued



The site is within the South Holland IDB area and the existing and proposed surface water discharge from the site will be directed into the High Priority watercourse H13 Falls Drain [DRN199G1303] running south along the eastern site boundary.

Continued

As the processes being undertaking inside the existing and proposed buildings need a level floor, Finished Floor Levels [FFL's] need to be identical to the existing site so there will be no raising of slab or ground levels.

SURFACE WATER DISPOSAL

The soils have no soakage potential.
Percolation is therefore not an option.

The SHIDB watercourse on the eastern boundary of the site falls to the south.

The lowest ditch bed level is 0.36mOD at the southern end of the watercourse. We propose, with IDB approval, to put the site outfall in this location.

Connection to the ditch +300mm up, i.e. 0.66mOD will make the bed of the pond 0.78mOD, with the top of the banks at natural ground level at 2.5mOD so it is capable of holding a 1m depth of water with a minimum of 720mm of freeboard.

This is 420mm more than would normally be allowed to enable the existing and proposed drainage to have sufficient gradients from all areas of the site to the pond. Cover over some of these systems will be minimal.

Where possible, the new surface areas will be permeable or drain to swales that discharge to the pond. Roof runoff will be piped to the ponds directly or into the permeable sub-base as this is considered clean runoff.

All permeable pavements will have granular sub-base providing SuDs source control and storage utilising a 30% void ratio aggregate.

These permeable pavements will be lined to form a tank[s].

Greenfield runoff values for QBar result in a 4.99l/s discharge rate.
See attached HR Wallingford Greenfield runoff calcs.

IDB requirements are that we discharge no more than 1.4l/s/ha and as the site is 3.406ha this would be 4.77l/s.

It is generally accepted that 5l/s should be considered as the minimum discharge rate to ensure that controls operate correctly with no undue blockages, so we propose to apply for a discharge consent based on this figure.

The pond indicated on the drawings is sized to suite the 100yr+40% climate change event and can provide 1,514cum of attenuation at 1m depth.

Continued

The proposed permeable areas add up to 5959sqm [not including urban creep] using a minimum of 300mm suitable stone with a 30% void ratio would give a further $5959 \times 0.3 \times 0.3 = 536\text{cum}$ of source-controlled storage, bringing the total to $1514 + 536 = 2050\text{cum}$ or 35% more than is strictly required.

There will be significant betterment from the original site runoff as the old discharge point will eventually be removed and the new system will cater for the whole of the site with all areas passing through the pond and single outfall control.

The final design will be refined to ensure compliance and make the most of the SuDs Management Train on the site.

FOUL WATER DISPOSAL

There is a private foul system on the site, any new foul water facilities that are built into the new areas will be connected to this system and any changes required in capacity will be addressed.

As commercial sites usually have very little by way of foul water discharge, it is not envisaged that any major changes will be required.

Any increase in flows will be advised to Anglian Water using a S106 application.

Continued

MAINTENANCE STRATEGY

Maintenance Responsibility

1. All pipes, manholes, swales, ponds, and underdrains will be maintained by the owner occupier.
2. The existing open watercourse to the east will continue to be maintained by South Holland IDB.

Recommended Private Area Maintenance Requirements

Proposed Permeable access areas

All permeable areas are to be swept quarterly to clear leaves and to ensure they are clean, tidy, and free from dust and debris.

At times of sweeping, inspections to take place to assess any damage to road, kerbs, lighting etc., and any maintenance carried out to ensure user safety is maintained.

Areas of permeable paving are to be maintained in accordance with CIRIA guidelines.

It should be noted that vacuum sweeping of any blockwork drives should not be carried out unless it is proposed to immediately replace the grit removed from between the blocks.

Any grit loss should immediately be replaced to prevent deterioration of the surface courses.

Existing Non-Permeable access areas

It is also recommended that these areas and their attendant drainage systems are also regularly cleaned and checked for blockages.

Continued

General Drainage Areas

A system of regular inspections should be established. Initially these inspections should be carried out in October and March, however, this may be modified to suit observations over time.

Items to be observed and cleared are high levels of grit, leaves, and other such detritus.

The main aim of these inspections will be to prevent siltation of the surface water system, which, if allowed to develop will reduce the effectiveness of the system and may, over time, reduce the attenuation volumes provided.

The following elements should be inspected and cleaned as part of this preventative routine:

Chambers, particularly catchpits

Headwalls and control chambers

Gullies and channels

Landscape

Generally, watercourses and ponds should be cut and maintained regularly so that grass remains reasonably short, chambers and headwalls to be always kept free of silt and debris. Maintenance of the ditch is NOT to be carried out if it is full or if the depth of standing water in the main channel exceeds 300mm.

Please refer to schedules below.

Additional Maintenance Requirements

It is suggested that all new employees are informed of the use and function of the surface water system at induction.

No loose materials such as soils or sand etc. shall be stockpiled directly on the permeable blockwork areas.

It is further recommended that the 'Bag it and Bin it' leaflet is handed to new employees to ensure unsuitable items are not flushed into the foul drainage system.

Continued

Operation and Maintenance Requirements for Permeable Pavements [CIRIA]

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually



Operation and Maintenance Requirements for Detention Basins [CIRIA]

TABLE 22.1 Operation and maintenance requirements for detention basins		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Operation and Maintenance Requirements for Swales [CIRIA]

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeded	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Operation and Maintenance Requirements for Receiving Ordinary Watercourse

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Walkover inspection of receiving ordinary watercourse	6 monthly (or as required)
	Maintenance dredge the receiving ordinary watercourse from the Control headwall Weir to the confluence with the main channel to remove silt build up and restore design bed level	First maintenance dredge on completion of SuDS swales and then 5-yearly (or as required)
	Vegetation is to be cut annually as a minimum.	Annually

9059-109 DRAINAGE AREAS



NOTES:
All dimensions must be checked on site and not scaled from this drawing.

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Anglian Water Notes

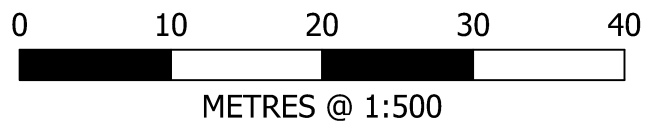
All S.104 adoptable drainage shall conform to the Design and construction guidance for foul and surface sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England.

All covers and frames on adoptable AW sewers are to be D400, kitemarked and be badged 'FW' or 'SW' accordingly. Suppliers shall be Stanton, Paul Savage, Norinco or Wrekin.

Adoptable pipework shall be to the following specification:

Clayware: BS EN 295-1 and BS65
150 dia. Crushing Strength 34kN/m
225 dia. Class 160

Concrete: BS EN 1916 and BS 5911-1
≥300 dia. Class 120



Date	Revisions

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Job Title

Cowper's Gate
Long Sutton
Spalding
Lincolnshire
PE12 9AY

Drawing Title

Drainage Areas

Date DEC 2023 Scale @ A1 1:500 Drawn TRS

Drg.No. 9059 -109 Rev. -

Area of existing roofs:	3126m ²	0.313 ha	Total existing: 8279m ² 0.828 ha
Area of existing drives:	5153m ²	0.515 ha	
Area of proposed roofs:	3285m ²	0.328 ha	Total proposed: 9244m ² 0.924 ha
Area of proposed drives:	5959m ²	0.596 ha	
Total impermeable area:	17,523m ²	1.752 ha	
Urban creep at 6%:	1,051m ²	0.105 ha	
Total impermeable area + urban creep: 18,574m ²			1.857 ha
Total site area			34057m ² 3.406 ha
therefore discharge rate =3.406 x 1.4l/s/ha = 4.768l/s rounded to the minimum 5l/s.			

PRELIMINARY
DRAWING

**HR Wallingford
Greenfield Runoff Calculations
&
Surface Water Calculations**

Calculated by:	Terence Stafford
Site name:	Cowper's Gate
Site location:	Long Sutton

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	52.77546° N
Longitude:	0.11579° E
Reference:	829129932
Date:	Dec 05 2023 11:57

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 3.406

Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	581	581
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Growth curve factor 200 years:	4.21	4.21

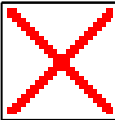
(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	4.99	4.99
1 in 1 year (l/s):	4.34	4.34
1 in 30 years (l/s):	12.23	12.23
1 in 100 year (l/s):	17.77	17.77
1 in 200 years (l/s):	21.01	21.01

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	250.0
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	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape Circular | Barrels 1 | Auto Increment (mm) 75 | Follow Ground x

Available Diameters (mm)

100 | 150

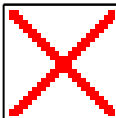
Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Storage	1.752	5.00	2.500		0.000	0.000	1.720
IDB Outfall			2.180		45.758	0.313	1.520
Control MH			2.500	1500	5.608	-2.034	2.040

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)
1.001	Control MH	IDB Outfall	25.000	0.600	0.760	0.660	0.100	250.0	450	5.39	68.0
1.000	Storage	Control MH	5.000	0.600	0.780	0.760	0.020	250.0	450	5.07	69.9

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)
1.001	1.281	203.7	323.0	1.290	1.070	1.752	0.0	450	1.297
1.000	1.281	203.7	331.8	1.270	1.290	1.752	0.0	450	1.297



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)
1.001	25.000	250.0	450	Circular	2.500	0.760	1.290	2.180	0.660	1.070
1.000	5.000	250.0	450	Circular	2.500	0.780	1.270	2.500	0.760	1.290

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	Control MH	1500	Manhole	Adoptable	IDB Outfall		Junction	
1.000	Storage		Junction		Control MH	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Storage	0.000	0.000	2.500	1.720					
IDB Outfall	45.758	0.313	2.180	1.520			0	1.000	0.780
							1	1.001	0.660
Control MH	5.608	-2.034	2.500	2.040	1500		1	1.000	0.760
							0	1.001	0.760

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	20	0	0	100	40	0	0

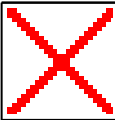
Node Control MH Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.780	Product Number	CTL-SHE-0106-5000-1000-5000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node Storage Depth/Area Storage Structure

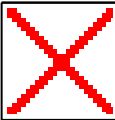
Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.780
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	990.0	0.0	1.620	2730.0	0.0



Rainfall

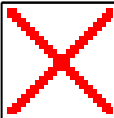
Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +20% CC 15 minute summer	418.486	118.417	100 year +40% CC 15 minute summer	488.233	138.153
100 year +20% CC 15 minute winter	293.674	118.417	100 year +40% CC 15 minute winter	342.620	138.153
100 year +20% CC 30 minute summer	274.758	77.747	100 year +40% CC 30 minute summer	320.551	90.705
100 year +20% CC 30 minute winter	192.813	77.747	100 year +40% CC 30 minute winter	224.948	90.705
100 year +20% CC 60 minute summer	183.946	48.611	100 year +40% CC 60 minute summer	214.603	56.713
100 year +20% CC 60 minute winter	122.209	48.611	100 year +40% CC 60 minute winter	142.577	56.713
100 year +20% CC 120 minute summer	111.074	29.354	100 year +40% CC 120 minute summer	129.587	34.246
100 year +20% CC 120 minute winter	73.795	29.354	100 year +40% CC 120 minute winter	86.094	34.246
100 year +20% CC 180 minute summer	83.767	21.556	100 year +40% CC 180 minute summer	97.729	25.149
100 year +20% CC 180 minute winter	54.451	21.556	100 year +40% CC 180 minute winter	63.526	25.149
100 year +20% CC 240 minute summer	65.123	17.210	100 year +40% CC 240 minute summer	75.977	20.078
100 year +20% CC 240 minute winter	43.266	17.210	100 year +40% CC 240 minute winter	50.477	20.078
100 year +20% CC 360 minute summer	48.580	12.501	100 year +40% CC 360 minute summer	56.677	14.585
100 year +20% CC 360 minute winter	31.578	12.501	100 year +40% CC 360 minute winter	36.841	14.585
100 year +20% CC 480 minute summer	37.697	9.962	100 year +40% CC 480 minute summer	43.979	11.622
100 year +20% CC 480 minute winter	25.045	9.962	100 year +40% CC 480 minute winter	29.219	11.622
100 year +20% CC 600 minute summer	30.518	8.347	100 year +40% CC 600 minute summer	35.604	9.738
100 year +20% CC 600 minute winter	20.851	8.347	100 year +40% CC 600 minute winter	24.327	9.738
100 year +20% CC 720 minute summer	26.943	7.221	100 year +40% CC 720 minute summer	31.433	8.424
100 year +20% CC 720 minute winter	18.107	7.221	100 year +40% CC 720 minute winter	21.125	8.424
100 year +20% CC 960 minute summer	21.799	5.740	100 year +40% CC 960 minute summer	25.432	6.697
100 year +20% CC 960 minute winter	14.440	5.740	100 year +40% CC 960 minute winter	16.847	6.697
100 year +20% CC 1440 minute summer	15.476	4.148	100 year +40% CC 1440 minute summer	18.055	4.839
100 year +20% CC 1440 minute winter	10.401	4.148	100 year +40% CC 1440 minute winter	12.134	4.839



Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage	1410	1.574	0.794	42.5	1141.6460	0.0000	SURCHARGED
15 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute winter	Control MH	1380	1.574	0.814	5.0	1.4389	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)
1440 minute winter	Storage	1.000	Control MH	5.0	0.121	0.025	0.7922	
1440 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				386.1



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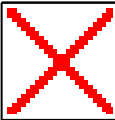
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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage	1410	1.692	0.912	49.6	1368.3950	0.0000	SURCHARGED
15 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute winter	Control MH	1410	1.692	0.932	5.0	1.6468	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)
1440 minute winter	Storage	1.000	Control MH	5.0	0.121	0.025	0.7922	
1440 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				406.6



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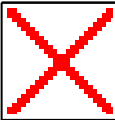
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Results for 100 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Storage	20	1.104	0.324	897.5	383.2815	0.0000	OK
15 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
15 minute summer	Control MH	20	1.104	0.344	6.9	0.6072	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	Storage	1.000	Control MH	6.9	0.380	0.034	0.6299	
15 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				73.8



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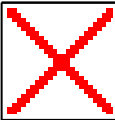
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Results for 100 year +20% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Storage	20	1.138	0.358	943.2	429.8553	0.0000	OK
15 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
15 minute winter	Control MH	20	1.137	0.377	8.5	0.6670	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Storage	1.000	Control MH	8.5	0.395	0.042	0.6926	
15 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				73.8



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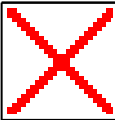
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Results for 100 year +20% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Storage	35	1.188	0.408	808.3	501.8964	0.0000	OK
30 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
30 minute summer	Control MH	35	1.188	0.428	6.9	0.7566	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	Storage	1.000	Control MH	6.9	0.346	0.034	0.7669	
30 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				76.2



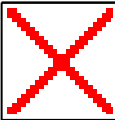
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Results for 100 year +20% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	Storage	34	1.230	0.450	731.2	563.1896	0.0000	OK
30 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
30 minute winter	Control MH	35	1.230	0.470	6.6	0.8305	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	Storage	1.000	Control MH	6.6	0.357	0.033	0.7919	
30 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				75.7



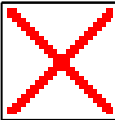
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Results for 100 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Storage	65	1.270	0.490	602.4	623.4421	0.0000	SURCHARGED
60 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
60 minute summer	Control MH	65	1.270	0.510	6.3	0.9013	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	Storage	1.000	Control MH	6.3	0.304	0.031	0.7922	
60 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				81.0



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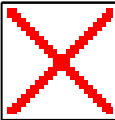
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Results for 100 year +20% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Storage	64	1.319	0.539	487.5	700.1168	0.0000	SURCHARGED
60 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
60 minute winter	Control MH	65	1.319	0.559	6.3	0.9872	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Storage	1.000	Control MH	6.3	0.313	0.031	0.7922	
60 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				79.7



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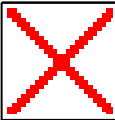
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Results for 100 year +20% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Storage	126	1.345	0.565	387.5	742.4952	0.0000	SURCHARGED
120 minute summer	IDB Outfall	2	0.660	0.000	5.0	0.0000	0.0000	OK
120 minute summer	Control MH	128	1.346	0.586	5.8	1.0353	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	Storage	1.000	Control MH	5.8	0.254	0.028	0.7922	
120 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				90.9



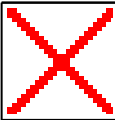
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Results for 100 year +20% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Storage	124	1.402	0.622	299.0	835.5825	0.0000	SURCHARGED
120 minute winter	IDB Outfall	2	0.660	0.000	5.0	0.0000	0.0000	OK
120 minute winter	Control MH	124	1.401	0.641	6.3	1.1327	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Storage	1.000	Control MH	6.3	0.259	0.031	0.7922	
120 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				87.2

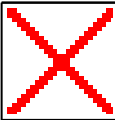


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Results for 100 year +20% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Storage	188	1.384	0.604	284.9	806.8654	0.0000	SURCHARGED
180 minute summer	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
180 minute summer	Control MH	184	1.385	0.625	5.5	1.1048	0.0000	SURCHARGED

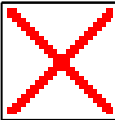
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	Storage	1.000	Control MH	5.5	0.206	0.027	0.7922	
180 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				100.8



Results for 100 year +20% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Storage	184	1.445	0.665	219.6	910.0644	0.0000	SURCHARGED
180 minute winter	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
180 minute winter	Control MH	188	1.446	0.686	5.4	1.2117	0.0000	SURCHARGED

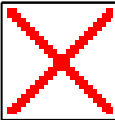
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	Storage	1.000	Control MH	5.4	0.225	0.026	0.7922	
180 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				96.7



Results for 100 year +20% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Storage	248	1.410	0.630	237.6	849.2904	0.0000	SURCHARGED
240 minute summer	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
240 minute summer	Control MH	248	1.410	0.650	5.4	1.1494	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Storage	1.000	Control MH	5.4	0.204	0.027	0.7922	
240 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				111.1



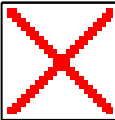
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Results for 100 year +20% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%

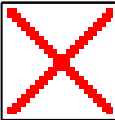
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Storage	244	1.473	0.693	176.9	958.6288	0.0000	SURCHARGED
240 minute winter	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
240 minute winter	Control MH	244	1.473	0.713	6.1	1.2600	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Storage	1.000	Control MH	6.1	0.192	0.030	0.7922	
240 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				110.9



Results for 100 year +20% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Storage	368	1.441	0.661	177.3	902.9281	0.0000	SURCHARGED
360 minute summer	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
360 minute summer	Control MH	368	1.442	0.682	5.3	1.2046	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Storage	1.000	Control MH	5.3	0.185	0.026	0.7922	
360 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				134.1



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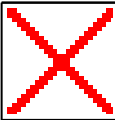
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Results for 100 year +20% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Storage	360	1.509	0.729	129.1	1021.8330	0.0000	SURCHARGED
360 minute winter	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
360 minute winter	Control MH	360	1.509	0.749	6.2	1.3237	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	Storage	1.000	Control MH	6.2	0.125	0.030	0.7922	
360 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				139.1



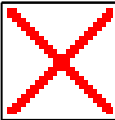
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Results for 100 year +20% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	Storage	488	1.462	0.682	137.6	939.3634	0.0000	SURCHARGED
480 minute summer	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
480 minute summer	Control MH	488	1.462	0.702	6.3	1.2399	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	Storage	1.000	Control MH	6.3	0.128	0.031	0.7922	
480 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				160.6



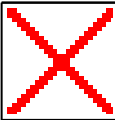
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Results for 100 year +20% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Storage	480	1.533	0.753	102.4	1064.4270	0.0000	SURCHARGED
480 minute winter	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
480 minute winter	Control MH	472	1.532	0.772	6.1	1.3646	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	Storage	1.000	Control MH	6.1	0.160	0.030	0.7922	
480 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				167.4



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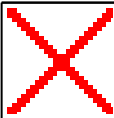
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Results for 100 year +20% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Storage	615	1.474	0.694	111.4	960.5632	0.0000	SURCHARGED
600 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
600 minute summer	Control MH	600	1.474	0.714	5.6	1.2619	0.0000	SURCHARGED

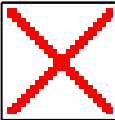
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	Storage	1.000	Control MH	5.6	0.122	0.028	0.7922	
600 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				185.9



Results for 100 year +20% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	Storage	600	1.548	0.768	85.2	1092.0440	0.0000	SURCHARGED
600 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
600 minute winter	Control MH	600	1.546	0.786	6.0	1.3897	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	Storage	1.000	Control MH	6.0	0.132	0.030	0.7922	
600 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				194.4



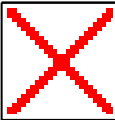
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Results for 100 year +20% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%

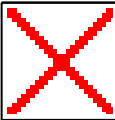
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	Storage	735	1.483	0.703	98.3	976.3063	0.0000	SURCHARGED
720 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
720 minute summer	Control MH	720	1.484	0.724	5.1	1.2790	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	Storage	1.000	Control MH	5.1	0.137	0.025	0.7922	
720 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				212.7



Results for 100 year +20% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Storage	720	1.558	0.778	74.0	1111.7110	0.0000	SURCHARGED
720 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
720 minute winter	Control MH	705	1.559	0.799	5.1	1.4122	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	Storage	1.000	Control MH	5.1	0.122	0.025	0.7922	
720 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				222.6



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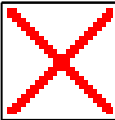
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Results for 100 year +20% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	Storage	960	1.493	0.713	79.6	994.0314	0.0000	SURCHARGED
960 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
960 minute summer	Control MH	960	1.494	0.734	5.1	1.2967	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute summer	Storage	1.000	Control MH	5.1	0.136	0.025	0.7922	
960 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				266.1



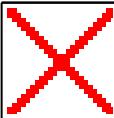
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Results for 100 year +20% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%

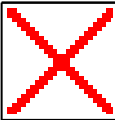
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	Storage	945	1.571	0.791	59.0	1135.2590	0.0000	SURCHARGED
960 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
960 minute winter	Control MH	945	1.570	0.810	6.3	1.4319	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	Storage	1.000	Control MH	6.3	0.122	0.031	0.7922	
960 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				278.3



Results for 100 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Storage	1440	1.492	0.712	56.5	990.8507	0.0000	SURCHARGED
1440 minute summer	IDB Outfall	30	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute summer	Control MH	1440	1.492	0.732	5.0	1.2941	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	Storage	1.000	Control MH	5.0	0.121	0.025	0.7922	
1440 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				367.5



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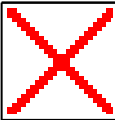
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Results for 100 year +20% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage	1410	1.574	0.794	42.5	1141.6460	0.0000	SURCHARGED
1440 minute winter	IDB Outfall	30	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute winter	Control MH	1380	1.574	0.814	5.0	1.4389	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	Storage	1.000	Control MH	5.0	0.121	0.025	0.7922	
1440 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				386.1



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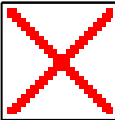
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Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Storage	20	1.150	0.370	1047.0	447.6818	0.0000	OK
15 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
15 minute summer	Control MH	20	1.150	0.390	8.7	0.6895	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	Storage	1.000	Control MH	8.7	0.395	0.043	0.7138	
15 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				73.7



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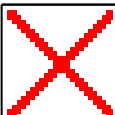
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Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Storage	20	1.188	0.408	1100.3	502.1016	0.0000	OK
15 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
15 minute winter	Control MH	20	1.188	0.428	7.9	0.7568	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Storage	1.000	Control MH	7.9	0.409	0.039	0.7671	
15 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				73.3



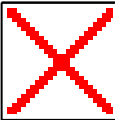
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Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Storage	35	1.246	0.466	943.0	586.7163	0.0000	SURCHARGED
30 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
30 minute summer	Control MH	36	1.245	0.485	7.1	0.8577	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	Storage	1.000	Control MH	7.1	0.352	0.035	0.7922	
30 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				75.3



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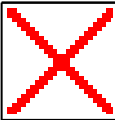
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Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	Storage	35	1.292	0.512	853.1	658.2531	0.0000	SURCHARGED
30 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
30 minute winter	Control MH	36	1.292	0.532	7.0	0.9402	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	Storage	1.000	Control MH	7.0	0.368	0.034	0.7922	
30 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				74.2



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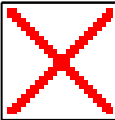
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Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Storage	65	1.337	0.557	702.7	729.5287	0.0000	SURCHARGED
60 minute summer	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
60 minute summer	Control MH	67	1.337	0.577	6.5	1.0204	0.0000	SURCHARGED

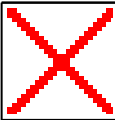
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	Storage	1.000	Control MH	6.5	0.310	0.032	0.7922	
60 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				78.6



Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Storage	64	1.392	0.612	568.8	819.1595	0.0000	SURCHARGED
60 minute winter	IDB Outfall	1	0.660	0.000	5.0	0.0000	0.0000	OK
60 minute winter	Control MH	63	1.393	0.633	6.1	1.1181	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Storage	1.000	Control MH	6.1	0.313	0.030	0.7922	
60 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				75.1



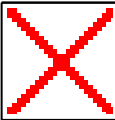
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Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Storage	126	1.423	0.643	452.1	870.9409	0.0000	SURCHARGED
120 minute summer	IDB Outfall	2	0.660	0.000	5.0	0.0000	0.0000	OK
120 minute summer	Control MH	124	1.423	0.663	5.8	1.1713	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	Storage	1.000	Control MH	5.8	0.265	0.029	0.7922	
120 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				84.6



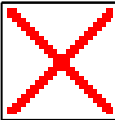
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Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Storage	124	1.485	0.705	348.8	979.2703	0.0000	SURCHARGED
120 minute winter	IDB Outfall	2	0.660	0.000	5.0	0.0000	0.0000	OK
120 minute winter	Control MH	124	1.486	0.726	5.6	1.2822	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Storage	1.000	Control MH	5.6	0.257	0.028	0.7922	
120 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				85.8

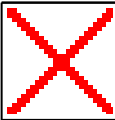


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Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Storage	188	1.467	0.687	332.4	948.1047	0.0000	SURCHARGED
180 minute summer	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
180 minute summer	Control MH	184	1.467	0.707	6.2	1.2493	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	Storage	1.000	Control MH	6.2	0.204	0.030	0.7922	
180 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				97.2



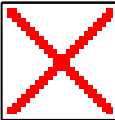
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Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Storage	184	1.534	0.754	256.1	1067.2410	0.0000	SURCHARGED
180 minute winter	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
180 minute winter	Control MH	184	1.534	0.774	6.2	1.3669	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	Storage	1.000	Control MH	6.2	0.235	0.030	0.7922	
180 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				101.1



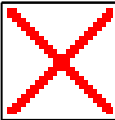
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Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Storage	248	1.496	0.716	277.2	998.9966	0.0000	SURCHARGED
240 minute summer	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
240 minute summer	Control MH	248	1.496	0.736	6.4	1.2999	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Storage	1.000	Control MH	6.4	0.203	0.031	0.7922	
240 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				111.7



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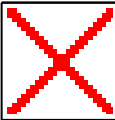
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Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Storage	244	1.566	0.786	206.4	1125.3620	0.0000	SURCHARGED
240 minute winter	IDB Outfall	4	0.660	0.000	5.0	0.0000	0.0000	OK
240 minute winter	Control MH	248	1.566	0.806	5.3	1.4242	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Storage	1.000	Control MH	5.3	0.195	0.026	0.7922	
240 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				116.4



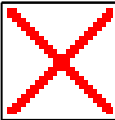
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Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Storage	368	1.532	0.752	206.8	1064.0820	0.0000	SURCHARGED
360 minute summer	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
360 minute summer	Control MH	368	1.532	0.772	5.8	1.3649	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Storage	1.000	Control MH	5.8	0.186	0.029	0.7922	
360 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				139.8



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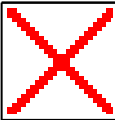
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Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Storage	360	1.607	0.827	150.6	1202.0800	0.0000	SURCHARGED
360 minute winter	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
360 minute winter	Control MH	360	1.607	0.847	5.2	1.4974	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	Storage	1.000	Control MH	5.2	0.123	0.026	0.7922	
360 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				146.1



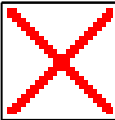
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Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	Storage	488	1.557	0.777	160.5	1108.8720	0.0000	SURCHARGED
480 minute summer	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
480 minute summer	Control MH	488	1.558	0.798	5.2	1.4094	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	Storage	1.000	Control MH	5.2	0.190	0.025	0.7922	
480 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				168.6



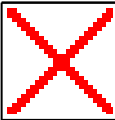
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Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%

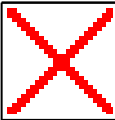
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Storage	480	1.634	0.854	119.4	1255.0720	0.0000	SURCHARGED
480 minute winter	IDB Outfall	8	0.660	0.000	5.0	0.0000	0.0000	OK
480 minute winter	Control MH	472	1.634	0.874	6.2	1.5443	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	Storage	1.000	Control MH	6.2	0.159	0.031	0.7922	
480 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				175.8



Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Storage	615	1.572	0.792	130.0	1136.7100	0.0000	SURCHARGED
600 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
600 minute summer	Control MH	615	1.572	0.812	5.1	1.4349	0.0000	SURCHARGED

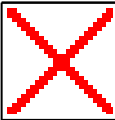
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	Storage	1.000	Control MH	5.1	0.122	0.025	0.7922	
600 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				195.5



Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	Storage	600	1.652	0.872	99.4	1289.8160	0.0000	SURCHARGED
600 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
600 minute winter	Control MH	600	1.653	0.893	5.1	1.5780	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	Storage	1.000	Control MH	5.1	0.151	0.025	0.7922	
600 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				204.2



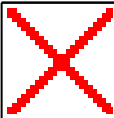
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Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	Storage	735	1.583	0.803	114.7	1157.5850	0.0000	SURCHARGED
720 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
720 minute summer	Control MH	735	1.583	0.823	6.1	1.4537	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	Storage	1.000	Control MH	6.1	0.122	0.030	0.7922	
720 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				223.9



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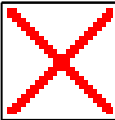
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Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Storage	720	1.666	0.886	86.4	1315.8860	0.0000	SURCHARGED
720 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
720 minute winter	Control MH	720	1.666	0.906	5.1	1.6009	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	Storage	1.000	Control MH	5.1	0.122	0.025	0.7922	
720 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				233.8



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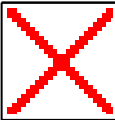
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Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	Storage	960	1.596	0.816	92.8	1182.9300	0.0000	SURCHARGED
960 minute summer	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
960 minute summer	Control MH	975	1.596	0.836	5.9	1.4777	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute summer	Storage	1.000	Control MH	5.9	0.145	0.029	0.7922	
960 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				280.5



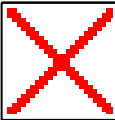
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Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	Storage	945	1.683	0.903	68.9	1349.4900	0.0000	SURCHARGED
960 minute winter	IDB Outfall	15	0.660	0.000	5.0	0.0000	0.0000	OK
960 minute winter	Control MH	945	1.683	0.923	6.2	1.6305	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	Storage	1.000	Control MH	6.2	0.122	0.030	0.7922	
960 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				292.6



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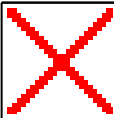
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Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Storage	1440	1.600	0.820	65.9	1189.9930	0.0000	SURCHARGED
1440 minute summer	IDB Outfall	30	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute summer	Control MH	1440	1.600	0.840	5.9	1.4848	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	Storage	1.000	Control MH	5.9	0.121	0.029	0.7922	
1440 minute summer	Control MH	Hydro-Brake®	IDB Outfall	5.0				388.5



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Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage	1410	1.692	0.912	49.6	1368.3950	0.0000	SURCHARGED
1440 minute winter	IDB Outfall	30	0.660	0.000	5.0	0.0000	0.0000	OK
1440 minute winter	Control MH	1410	1.692	0.932	5.0	1.6468	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	Storage	1.000	Control MH	5.0	0.121	0.025	0.7922	
1440 minute winter	Control MH	Hydro-Brake®	IDB Outfall	5.0				406.6

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