LIN Consulting

APPENDIX D: Site Investigation

Hello Gavin,

Further to your email to Steve Sellers, please find below our comments on the groundwater levels encountered at the site.

Water was encountered at variable depths during the advancement of the trial pits and window sample holes, including seepages from de between approximately 1.00m and 3.30m below existing ground levels (begl) (and locally deeper). In some exploratory hole locations, no during excavation / drilling works for the short time they were left open after completion before backfilling.

During the subsequent water level monitoring within the installed standpipes as part of the initial programme of gas monitoring (excluding monitoring being carried out this afternoon), water levels have generally been recorded to range between approximately 1.10m and 2.28n recorded as shallow as 0.79m begl in one location.

We hope the above is suitable for your present requirements. Should you have any queries, please do hesitate to contact us.

Kind regards

Daniel

For and on behalf of **GeoDyne Limited**

Daniel Brunt | Associate
Tel: 01332 290798
Mob: 07932 083449
Web: www.geodyne.co.uk

Nottingham Office: Clarendon House, Clarendon Park, Clumber Avenue, Nottingham NG5 1AH Tel: 0115 962 0001
Derby Office: 9 Brunel Parkway, Pride Park, Derby, DE24 8HR Tel: 01332 290798

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GeoDyne is an enviromentally friendly company so please think about the environment before printing this email. Thank you.

From: Steve Sellers <SteveSellers@geodyne.co.uk>
Sent: 17 August 2021 14:59
To: Daniel Brunt <DanielBrunt@geodyne.co.uk>
Subject: FW: Lincs Gateway Phase 2 SI - Groundwater

From: Gavin Baxter [mailto:gavin.baxter@ashwoodhomes.co]
Sent: 17 August 2021 14:25
To: Steve Sellers <SteveSellers@geodyne.co.uk>
Cc: Adam Jagger <adam.jagger@ashwoodhomes.co>
Subject: Lincs Gateway Phase 2 SI - Groundwater

Steve

Could you provide a quick note on the groundwater levels found on Phase 2 ahead of the report on Friday – we are just tidying up the FRA

Thank you,

Gavin Baxter BSc(Hons)
Development Engineer

T: 01406 490590
M: 07538 180134
E: gavin.baxter@ashwoodhomes.co
W: www.ashwoodhomes.co

1 Goodison Road, Lincs Gateway Business Park,
Spalding, Lincolnshire PE12 6FY

APPENDIX E: Greenfield Run-Off Rate

Print | Close Report

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Stuart O'Neill
Site name:	Lincs Gateway
Site location:	Spalding

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:	52.76256° N
Longitude:	0.15693° W
Reference:	2059447943
Date:	May 12 2023 10:41

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 18.66

Methodology

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

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

Hydrological characteristics	Default	Edited
SAAR (mm):	558	558
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

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.

(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.

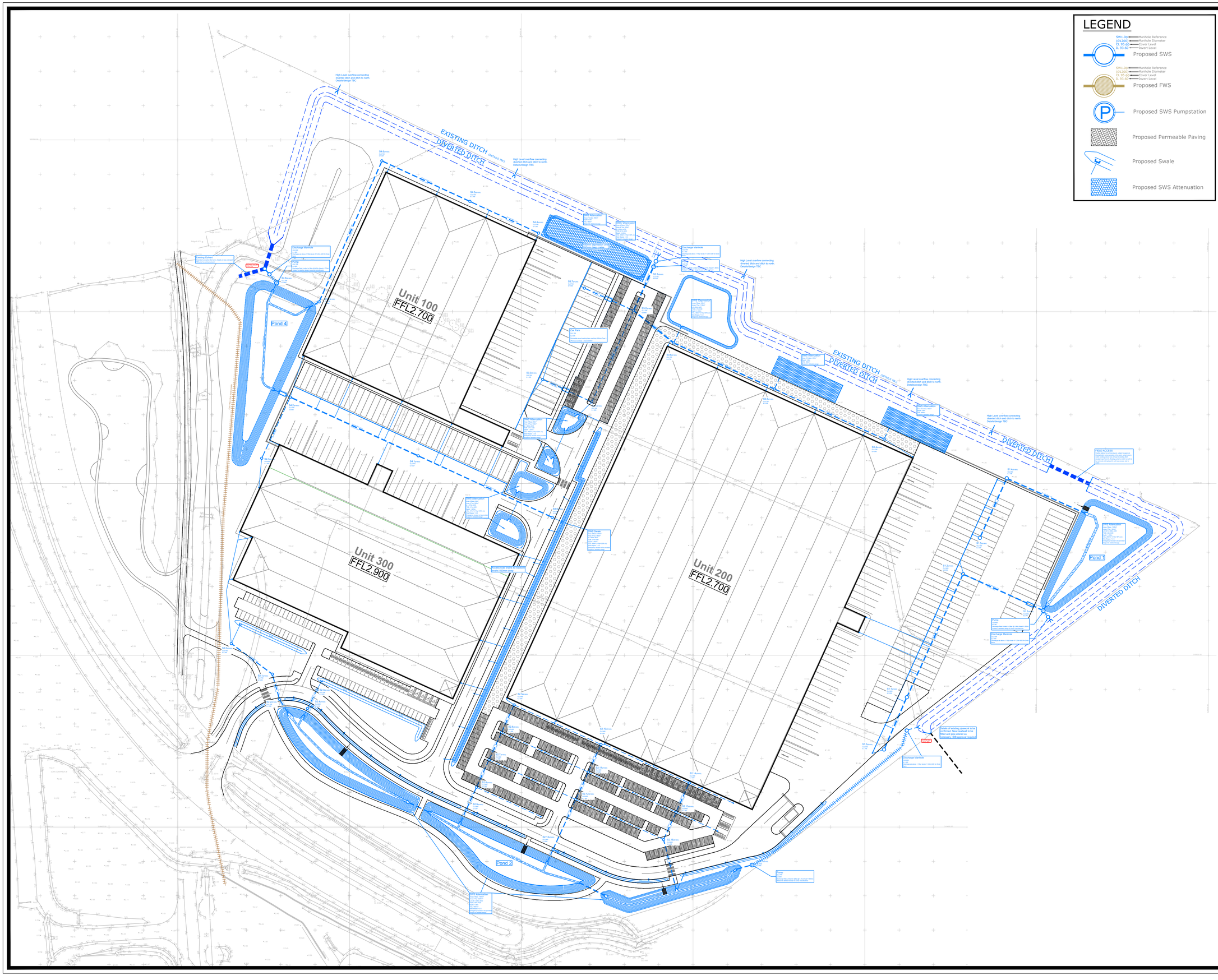
(3) Is SPR/SPRHOST ≤ 0.3?

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):	26.08	26.08
1 in 1 year (l/s):	22.69	22.69
1 in 30 years (l/s):	63.9	63.9
1 in 100 year (l/s):	92.86	92.86
1 in 200 years (l/s):	109.81	109.81

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.

APPENDIX F: Drainage Strategy



NOTES/LEGEND

PRIVATE CONSTRUCTION REQUIREMENTS

1. DO NOT SCALE FROM THIS DRAWING. WHILST THE DRAWING HAS BEEN PRODUCED DIMENSIONALLY, THE ACCURACY DURING REPRODUCTION CANNOT BE GUARANTEED;

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS PRODUCED BY OTHERS, INCLUDING ENGINEERS, ARCHITECTS AND SPECIALIST DESIGNS. FOR THE PURPOSES OF THIS DRAWING, THE FOLLOWING HAVE BEEN REFERENCED;

TOPOGRAPHICAL SURVEY: ALS 5957/500 SERIES, DATED JULY 21
ARCHITECTS LAYOUT: 96-PL-SL-01, DATED JULY 21;

LIN CONSULTING ACCEPT NO RESPONSIBILITY FOR THE INACCURACIES OF INFORMATION THAT IS PROVIDED BY THIRD PARTY;

3. ALL DIMENSIONS SPECIFIED ARE IN (MILLI)METERS AND ALL LEVELS ARE IN METERS (RELATING TO METERS ABOVE ORDNANCE DATUM WHERE AVAILABLE);

4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY;

5. THE SPECIFICATION IN ALL RESPECTS SHALL BE IN ACCORDANCE WITH THE LINCOLNSHIRE COUNTY COUNCIL DEVELOPMENT ROAD AND SUSTAINABLE DRAINAGE SPECIFICATION AND CONSTRUCTION. **PLEASE NOTE THAT THE ROADS WILL NOT BE ADOPTED UNDER S38 AGREEMENT AND WILL REMAIN PRIVATELY MAINTAINED**;

6. THE CONNECTION TO THE S278 ENTRANCE BELLMOUTH HAS BEEN BASED UPON SURVEY LEVELS SUPPLIED AT TIME. THE CONTRACTOR SHALL CHECK ALL TIE-INS FOR LINE AND LEVEL PRIOR TO COMMENCEMENT OF WORKS. SHOULD ANY DISCREPANCIES BE FOUND THEN THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY;

7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE EXISTING UTILITY APPARATUS. THE CLIENT WILL ACCEPT NO CLAIMS WHATSOEVER IN RESPECT OF ANY LOSSES OR DAMAGES CAUSED THROUGH CONSTRUCTION;

8. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORKS ARE CARRIED OUT TO THE SPECIFICATION AND IS DEEMED TO HAVE INCLUDED WITHIN THEIR RATES FOR NECESSARY TESTING IN ACCORDANCE WITH ADOPTION PROCEDURES OF LCC;

9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERTAKE THE WORKS AT ALL TIMES IN STRICT ACCORDANCE WITH THE HEALTH & SAFETY AT WORK 1974 AND THE CDM REGULATIONS 2015, AND WILL BE DEEMED TO HAVE INCLUDED WITHIN THEIR RATES;

10. ALL MATERIALS WITHIN 450mm OF FINISHED ROAD LEVELS ARE TO BE FROST SUSCEPTIBLE;

11. CBR TESTS TO BE CONDUCTED IN ACCORDANCE WITH LCC STANDARDS. FINAL SUB-BASE AND CAPPING REQUIREMENTS TO BE AGREED WITH ENGINEER PRIOR TO COMMENCEMENT OF WORKS. ALL SOFT SPOTS TO BE RECORDED AND REPLACED WITH SUITABLE GRANULAR MATERIAL - ENGINEER TO CONFIRM;

12. CONSULTATION WITH FRA 1034 01 R6, DATED MARCH 2011 INDICATES A CONTROLLED LEVEL OF 0.85M AOD FOR THE CLAY LAKE DRAIN. CONFIRMATION OF THIS LEVEL REQUIRED PRIOR TO DETAILED DESIGN;

13. CONNECTION POINT OF THE FW RISING MAIN HAS BEEN CONFIRMED BY ANGLIAN WATER. APPROVAL OF THE PUMPING STATION AND RISING MAIN ROUTE IS SUBJECT TO APPROVAL AND ADOPTION BY ANGLIAN WATER;

14. IN LIEU OF MODELLED WATER COURSE LEVELS ALL SW SEWERS HAVE BEEN MODELLED AGAINST A SURCHARGED OUTFALL @ 1.25m FOR THE 100yr (+30%) CLIMATE CHANGE EVENTS;

15. DISCHARGE RATES FOR THE 3 OUTFALLS ARE TO BE APPROVED IN WRITING BY THE IDB PRIOR TO COMMENCEMENT;

16. DIVERSION OF THE EXISTING WATERCOURSE IS SUBJECT TO APPROVAL BY IDB. FURTHER INFORMATION AND MODELLING WILL BE NECESSARY TO SATISFY IDB

Rev	Date	Description	Made	Checked
B	12/05/2023	UPDATED LAYOUT. ISSUED IN FRA	ZJ	SON
A	22/02/2023	ISSUED FOR COMMENT	ZJ	SON

Status of Drawing; ISSUED FOR COMMENT

Client
ALCAN PROPERTIES LTD

Project
LINCS GATEWAY
SPALDING

Drawing Title
ENGINEERING LAYOUT

LIN Consulting
07341 337283
www.linconsulting.co.uk
stuart@linconsulting.co.uk

Drawn	Check'd	Approved	Scales	Drawing No.	Rev
ZJ	SON	SON	1:1000	AP/LG/100	B
Date: FEB 2023					

LIN Consulting

APPENDIX G: Drainage Calculations

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)	19.000	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	✓

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	1.0	1.1	33.171	0.600	1.245	1.159	0.086	385.7	600	5.45	50.0
1.001	1.1	1.2	78.806	0.600	1.009	0.907	0.102	772.6	750	6.76	50.0
1.002	1.2	1.3	51.157	0.600	0.907	0.841	0.066	775.1	750	7.62	50.0
1.003	1.5	1.4	38.057	0.600	1.245	1.146	0.099	385.0	600	5.51	50.0
1.004	1.4	Headwall	50.835	0.600	1.146	1.014	0.132	385.0	600	6.20	50.0
1.005	1.3	Outfall	6.901	0.600	0.841	0.800	0.041	168.3	225	7.73	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)
1.000	1.234	348.8	73.6	0.755	0.841	0.543	0.0
1.001	0.999	441.2	162.8	0.841	0.943	1.201	0.0
1.002	0.997	440.5	162.8	0.943	0.709	1.201	0.0
1.003	1.235	349.1	72.4	0.755	0.854	0.534	0.0
1.004	1.235	349.1	72.4	0.854	0.686	0.534	0.0
1.005	1.005	39.9	162.8	1.234	1.275	1.201	0.0

Simulation Settings

Rainfall Methodology	FEH-99	E (1km)	0.303	Skip Steady State	x
C (1km)	-0.021	F (1km)	2.480	Drain Down Time (mins)	240
D1 (1km)	0.344	Summer CV	0.750	Additional Storage (m³/ha)	20.0
D2 (1km)	0.336	Winter CV	0.840	Check Discharge Rate(s)	x
D3 (1km)	0.239	Analysis Speed	Normal	Check Discharge Volume	x

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 1.3 Online Pump Control

Flap Valve	x	Design Depth (m)	1.200	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	2.4		
Invert Level (m)	0.841	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)
0.500	2.400

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Node 1.3 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	68.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.841	Main Channel Slope (1:X)	500.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	2.000

Inlets
Headwall

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1328.0	0.0	1.436	1964.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	1.0	33	1.404	0.159	51.3	1.6770	0.0000	OK
60 minute summer	1.1	33	1.270	0.261	113.1	2.8199	0.0000	OK
2880 minute winter	1.2	2340	1.257	0.350	6.9	0.8901	0.0000	OK
2880 minute winter	1.3	2340	1.257	0.416	6.6	1.0580	0.0000	SURCHARGED
60 minute summer	1.4	34	1.301	0.155	50.4	0.3952	0.0000	OK
60 minute summer	1.5	33	1.403	0.158	50.4	1.6490	0.0000	OK
2880 minute winter	Headwall	2340	1.257	0.280	4.2	0.7119	0.0000	OK
60 minute summer	Outfall	1	0.800	0.000	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	1.0	1.000	1.1	51.0	0.924	0.146	1.8347	
60 minute summer	1.1	1.001	1.2	111.9	0.885	0.254	9.9772	
2880 minute winter	1.2	1.002	1.3	6.6	0.422	0.015	11.5534	
2880 minute winter	1.3	Pump	Outfall	2.0				222.3
60 minute summer	1.4	1.004	Headwall	49.6	0.922	0.142	2.7399	
60 minute summer	1.5	1.003	1.4	50.4	0.871	0.144	2.2104	
2880 minute winter	Headwall	Flow through pond	1.3	1.1	0.001	0.002	489.6684	

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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	1.0	2820	1.593	0.348	6.3	3.6755	0.0000	OK
2880 minute winter	1.1	2820	1.593	0.584	13.8	6.3175	0.0000	OK
2880 minute winter	1.2	2820	1.593	0.686	13.4	1.7461	0.0000	OK
2880 minute winter	1.3	2820	1.593	0.752	12.8	1.9141	0.0000	SURCHARGED
2880 minute winter	1.4	2820	1.593	0.447	6.2	1.1379	0.0000	OK
2880 minute winter	1.5	2820	1.593	0.348	6.2	3.6296	0.0000	OK
2880 minute winter	Headwall	2820	1.593	0.616	8.2	1.5680	0.0000	OK
60 minute summer	Outfall	1	0.800	0.000	1.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	1.0	1.000	1.1	6.2	0.498	0.018	6.4328	
2880 minute winter	1.1	1.001	1.2	13.4	0.279	0.030	31.1335	
2880 minute winter	1.2	1.002	1.3	12.8	0.466	0.029	22.0499	
2880 minute winter	1.3	Pump	Outfall	2.4				305.3
2880 minute winter	1.4	1.004	Headwall	5.9	0.386	0.017	12.8088	
2880 minute winter	1.5	1.003	1.4	6.2	0.455	0.018	7.5111	
2880 minute winter	Headwall	Flow through pond	1.3	-2.3	0.001	-0.004	1013.1812	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	1.0	2820	2.109	0.864	10.7	9.1260	0.0000	SURCHARGED
2880 minute winter	1.1	2820	2.109	1.100	23.2	11.9007	0.0000	SURCHARGED
2880 minute winter	1.2	2820	2.109	1.202	22.5	3.0598	0.0000	SURCHARGED
2880 minute winter	1.3	2820	2.109	1.268	22.0	3.2278	0.0000	FLOOD RISK
2880 minute winter	1.4	2820	2.109	0.963	10.1	2.4516	0.0000	SURCHARGED
2880 minute winter	1.5	2820	2.109	0.864	10.5	9.0120	0.0000	SURCHARGED
2880 minute winter	Headwall	2820	2.109	1.132	14.6	2.8817	0.0000	OK
60 minute summer	Outfall	1	0.800	0.000	2.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	1.0	1.000	1.1	10.3	0.504	0.030	9.3435	
2880 minute winter	1.1	1.001	1.2	22.5	0.326	0.051	34.6842	
2880 minute winter	1.2	1.002	1.3	22.0	0.533	0.050	22.5153	
2880 minute winter	1.3	Pump	Outfall	2.4				336.0
2880 minute winter	1.4	1.004	Headwall	9.7	0.380	0.028	14.3191	
2880 minute winter	1.5	1.003	1.4	10.1	0.464	0.029	10.7198	
2880 minute winter	Headwall	Flow through pond	1.3	-4.9	0.001	-0.009	1914.1174	

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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)	19.000	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	✓

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	1.0	1.1	33.171	0.600	1.245	1.159	0.086	385.7	600	5.45	50.0
1.001	1.1	1.2	78.806	0.600	1.009	0.907	0.102	772.6	750	6.76	50.0
1.002	1.2	1.3	51.157	0.600	0.907	0.841	0.066	775.1	750	7.62	50.0
1.003	1.5	1.4	38.057	0.600	1.245	1.146	0.099	385.0	600	5.51	50.0
1.004	1.4	Headwall	50.835	0.600	1.146	1.014	0.132	385.0	600	6.20	50.0
1.005	1.3	Outfall	6.901	0.600	0.841	0.800	0.041	168.3	225	7.73	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)
1.000	1.234	348.8	73.6	0.755	0.841	0.543	0.0
1.001	0.999	441.2	162.8	0.841	0.943	1.201	0.0
1.002	0.997	440.5	162.8	0.943	0.709	1.201	0.0
1.003	1.235	349.1	72.4	0.755	0.854	0.534	0.0
1.004	1.235	349.1	72.4	0.854	0.686	0.534	0.0
1.005	1.005	39.9	162.8	1.234	1.275	1.201	0.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	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 %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 1.3 Online Pump Control

Flap Valve	x	Design Depth (m)	1.200	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	2.4		
Invert Level (m)	0.841	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)
0.500	2.400

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Node 1.3 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	68.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.841	Main Channel Slope (1:X)	500.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	2.000

Inlets
Headwall

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1328.0	0.0	1.436	1964.0	0.0

Flow+ v10.1 Copyright © 1988-2023 Causeway Technologies Ltd

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.51%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1.0	12	1.541	0.296	93.8	3.1267	0.0000	OK
15 minute winter	1.1	12	1.530	0.521	203.9	5.6377	0.0000	OK
15 minute winter	1.2	12	1.499	0.592	230.0	1.5079	0.0000	OK
1440 minute winter	1.3	1410	1.207	0.366	10.2	0.9316	0.0000	SURCHARGED
15 minute winter	1.4	11	1.357	0.211	89.5	0.5376	0.0000	OK
15 minute winter	1.5	10	1.461	0.216	92.2	2.2570	0.0000	OK
1440 minute winter	Headwall	1410	1.207	0.230	6.8	0.5855	0.0000	OK
15 minute summer	Outfall	1	0.800	0.000	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1.0	1.000	1.1	90.2	1.009	0.259	5.3339	
15 minute winter	1.1	1.001	1.2	230.0	0.928	0.521	27.5765	
15 minute winter	1.2	1.002	1.3	314.1	2.484	0.713	9.6710	
1440 minute winter	1.3	Pump	Outfall	1.8				105.1
15 minute winter	1.4	1.004	Headwall	87.9	1.081	0.252	4.1784	
15 minute winter	1.5	1.003	1.4	89.5	1.024	0.256	3.4049	
1440 minute winter	Headwall	Flow through pond	1.3	-2.1	0.001	-0.004	416.5801	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.51%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1.0	11	1.952	0.707	177.7	7.4610	0.0000	SURCHARGED
15 minute summer	1.1	11	1.894	0.885	376.1	9.5750	0.0000	SURCHARGED
15 minute summer	1.2	11	1.744	0.837	464.2	2.1313	0.0000	SURCHARGED
1440 minute winter	1.3	1410	1.411	0.570	17.0	1.4503	0.0000	SURCHARGED
15 minute winter	1.4	11	1.450	0.304	170.1	0.7739	0.0000	OK
15 minute winter	1.5	10	1.560	0.315	174.8	3.2890	0.0000	OK
1440 minute winter	Headwall	1410	1.411	0.434	11.6	1.1042	0.0000	OK
15 minute summer	Outfall	1	0.800	0.000	1.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1.0	1.000	1.1	196.9	1.016	0.565	9.3435	
15 minute summer	1.1	1.001	1.2	464.2	1.187	1.052	34.6842	
15 minute summer	1.2	1.002	1.3	579.6	2.890	1.316	11.4922	
1440 minute winter	1.3	Pump	Outfall	2.4				154.9
15 minute winter	1.4	1.004	Headwall	169.5	1.291	0.486	6.6991	
15 minute winter	1.5	1.003	1.4	170.1	1.182	0.487	5.5460	
1440 minute winter	Headwall	Flow through pond	1.3	-3.5	0.001	-0.006	723.3141	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.51%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1.0	10	2.575	1.330	284.9	14.0382	0.0000	FLOOD RISK
15 minute summer	1.1	10	2.455	1.446	684.0	15.6400	0.0000	FLOOD RISK
15 minute winter	1.2	9	2.167	1.260	779.7	3.2057	0.0000	SURCHARGED
1440 minute winter	1.3	1440	1.736	0.895	27.5	2.2777	0.0000	SURCHARGED
1440 minute winter	1.4	1440	1.736	0.590	13.1	1.5014	0.0000	OK
1440 minute winter	1.5	1440	1.736	0.491	13.5	5.1191	0.0000	OK
1440 minute winter	Headwall	1440	1.736	0.759	18.6	1.9316	0.0000	OK
15 minute summer	Outfall	1	0.800	0.000	1.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1.0	1.000	1.1	354.6	1.259	1.017	9.3435	
15 minute summer	1.1	1.001	1.2	766.4	1.741	1.737	34.6842	
15 minute winter	1.2	1.002	1.3	841.7	3.031	1.911	13.0563	
1440 minute winter	1.3	Pump	Outfall	2.4				173.1
1440 minute winter	1.4	1.004	Headwall	12.4	0.490	0.036	14.2923	
1440 minute winter	1.5	1.003	1.4	13.1	0.557	0.037	10.0367	
1440 minute winter	Headwall	Flow through pond	1.3	-6.2	0.001	-0.011	1250.6937	

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	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	✓

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)
2.000	2.0	2.1	29.780	0.600	1.300	1.226	0.074	405.0	450	5.49	49.9
2.001	2.1	2.2	15.347	0.600	1.226	1.188	0.038	405.0	450	5.75	48.9
2.002	2.2	HW2.0	12.579	0.600	1.188	1.144	0.044	285.9	450	5.92	48.2
2.003	2.3	2.4	12.046	0.600	1.275	1.210	0.065	185.3	225	5.21	50.0
2.004	2.4	HW2.1	4.486	0.600	1.210	1.176	0.034	131.9	225	5.28	50.0
2.005	2.5	2.6	17.629	0.600	1.250	1.195	0.055	320.5	450	5.26	50.0
2.006	2.6	2.7	17.495	0.600	1.195	1.141	0.054	324.0	450	5.52	49.8
2.007	2.7	2.8	17.576	0.600	1.141	1.086	0.055	319.6	450	5.78	48.8
2.008	2.8	2.9	14.229	0.600	1.086	1.042	0.044	323.4	450	5.99	48.0
2.009	2.9	HW2.5	9.725	0.600	1.042	1.012	0.030	324.2	450	6.13	47.4
2.010	2.10	2.11	17.748	0.600	1.250	1.206	0.044	405.0	450	5.29	50.0
2.011	2.11	2.12	17.509	0.600	1.206	1.163	0.043	405.0	450	5.59	49.5
2.012	2.12	2.13	31.826	0.600	1.163	1.084	0.079	405.0	450	6.11	47.5
2.013	2.13	HW2.10	9.687	0.600	1.084	1.060	0.024	405.0	450	6.27	46.9
2.014	2.14	2.15	18.652	0.600	1.250	1.192	0.058	321.6	450	5.28	50.0
2.015	2.15	2.16	17.539	0.600	1.192	1.137	0.055	318.9	450	5.53	49.7
2.016	2.16	HW2.14	29.615	0.600	1.137	1.042	0.095	311.7	450	5.96	48.0

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)
2.000	1.004	159.6	51.0	0.950	1.024	0.377	0.0	174	0.897
2.001	1.004	159.6	49.9	1.024	1.062	0.377	0.0	173	0.892
2.002	1.197	190.4	53.4	1.062	1.006	0.409	0.0	162	1.032
2.003	0.957	38.0	23.6	1.200	1.265	0.174	0.0	129	1.008
2.004	1.136	45.2	36.5	1.265	1.199	0.269	0.0	153	1.260
2.005	1.130	179.7	79.3	0.900	0.955	0.585	0.0	209	1.095
2.006	1.124	178.7	88.7	0.955	1.009	0.657	0.0	224	1.121
2.007	1.132	180.0	96.6	1.009	1.064	0.731	0.0	235	1.151
2.008	1.125	178.9	106.7	1.064	1.108	0.821	0.0	251	1.172
2.009	1.123	178.7	105.5	1.108	1.138	0.821	0.0	249	1.168
2.010	1.004	159.6	82.4	0.900	0.944	0.608	0.0	229	1.011
2.011	1.004	159.6	94.8	0.944	0.987	0.706	0.0	250	1.045
2.012	1.004	159.6	105.0	0.987	1.066	0.816	0.0	267	1.068
2.013	1.004	159.6	110.7	1.066	1.090	0.871	0.0	276	1.081
2.014	1.128	179.4	82.1	0.900	0.958	0.606	0.0	214	1.105
2.015	1.133	180.2	94.9	0.958	1.013	0.704	0.0	232	1.148
2.016	1.146	182.2	102.9	1.013	1.108	0.790	0.0	242	1.179

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.017	2.17	OUTFALL HW	121.728	0.600	0.800	0.600	0.200	608.6	300	8.22	40.9

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)
2.017	0.630	44.5	0.0	1.600	1.800	0.000	0.0	0	0.000

Simulation Settings

Rainfall Methodology	FEH-99	E (1km)	0.303	Skip Steady State	x
C (1km)	-0.021	F (1km)	2.480	Drain Down Time (mins)	240
D1 (1km)	0.344	Summer CV	0.750	Additional Storage (m³/ha)	20.0
D2 (1km)	0.336	Winter CV	0.840	Check Discharge Rate(s)	x
D3 (1km)	0.239	Analysis Speed	Normal	Check Discharge Volume	x

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 2.17 Online Pump Control

Flap Valve	x	Design Depth (m)	1.650	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	4.7		
Invert Level (m)	0.800	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.000	0.500	4.700

Node 2.17 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	220.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.800	Main Channel Slope (1:X)	1000.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.033

Inlets

HW2.0	HW2.1	HW2.5	HW2.10	HW2.14

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1595.0	0.0	1.800	3584.0	0.0

Node 2.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	520.0	0.0	0.350	520.0	0.0	0.351	0.0	0.0

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Node 2.5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	248.0	0.0	0.350	248.0	0.0	0.351	0.0	0.0

Node 2.10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	7

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	310.0	0.0	0.350	310.0	0.0	0.351	0.0	0.0

Node 2.14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	302.0	0.0	0.350	302.0	0.0	0.351	0.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	2.0	33	1.450	0.150	35.6	1.0735	0.0000	OK
60 minute summer	2.1	33	1.380	0.154	35.5	0.2715	0.0000	OK
2880 minute winter	2.2	2220	1.361	0.173	2.6	0.3789	0.0000	OK
60 minute summer	2.3	33	1.389	0.114	16.4	0.4804	0.0000	OK
2880 minute winter	2.4	2220	1.362	0.152	1.8	0.4628	0.0000	OK
2880 minute winter	HW2.0	2280	1.366	0.346	9.9	0.0028	0.0000	OK
2880 minute winter	HW2.1	2220	1.369	0.349	4.2	0.0028	0.0000	OK
60 minute summer	2.5	33	1.444	0.194	55.2	2.1761	0.0000	OK
60 minute summer	2.6	34	1.404	0.209	61.5	0.7475	0.0000	OK
60 minute summer	2.7	34	1.368	0.227	67.7	0.8076	0.0000	OK
2880 minute winter	2.8	2220	1.365	0.279	6.9	1.0403	0.0000	OK
2880 minute winter	2.9	2460	1.364	0.322	5.7	0.8184	0.0000	OK
2880 minute winter	HW2.5	2220	1.371	0.359	8.5	0.0029	0.0000	OK
60 minute summer	2.10	33	1.466	0.216	57.4	2.4965	0.0000	OK
60 minute summer	2.11	34	1.436	0.230	65.8	0.9104	0.0000	OK
60 minute summer	2.12	34	1.400	0.237	75.3	0.9664	0.0000	OK
2880 minute winter	2.13	2340	1.364	0.280	5.3	0.9141	0.0000	OK
2880 minute winter	HW2.10	2160	1.365	0.345	10.9	0.0028	0.0000	OK
60 minute summer	2.14	33	1.447	0.197	57.2	2.2722	0.0000	OK
60 minute summer	2.15	33	1.404	0.212	66.0	0.8361	0.0000	OK
2880 minute winter	2.16	2160	1.358	0.221	4.7	0.8227	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	2.0	2.000	2.1	35.5	0.756	0.223	1.3997	
60 minute summer	2.1	2.001	2.2	35.2	0.766	0.221	0.7068	
2880 minute winter	2.2	2.002	HW2.0	4.0	0.442	0.021	0.8373	
60 minute summer	2.3	2.003	2.4	16.4	0.719	0.430	0.2740	
2880 minute winter	2.4	2.004	HW2.1	4.2	0.522	0.094	0.1450	
2880 minute winter	HW2.0	Flow through pond	2.17	18.6	0.035	0.001	830.8435	
2880 minute winter	HW2.1	Flow through pond	2.17	18.6	0.035	0.001	830.8435	
60 minute summer	2.5	2.005	2.6	54.7	0.803	0.304	1.2113	
60 minute summer	2.6	2.006	2.7	60.7	0.813	0.340	1.3323	
60 minute summer	2.7	2.007	2.8	67.1	0.807	0.373	1.4929	
2880 minute winter	2.8	2.008	2.9	5.7	0.438	0.032	1.5999	
2880 minute winter	2.9	2.009	HW2.5	5.6	0.440	0.031	1.2462	
2880 minute winter	HW2.5	Flow through pond	2.17	18.6	0.035	0.001	830.8435	
60 minute summer	2.10	2.010	2.11	56.5	0.730	0.354	1.3885	
60 minute summer	2.11	2.011	2.12	64.9	0.792	0.407	1.4561	
60 minute summer	2.12	2.012	2.13	74.7	0.852	0.468	2.8353	
2880 minute winter	2.13	2.013	HW2.10	7.2	0.469	0.045	1.0487	
2880 minute winter	HW2.10	Flow through pond	2.17	18.6	0.035	0.001	830.8435	
60 minute summer	2.14	2.014	2.15	56.7	0.813	0.316	1.3090	
60 minute summer	2.15	2.015	2.16	65.4	0.878	0.363	1.3198	
2880 minute winter	2.16	2.016	HW2.14	4.6	0.470	0.025	2.9164	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	HW2.14	2160	1.359	0.339	5.8	0.6986	0.0000	OK
2880 minute winter	2.17	2220	1.357	0.557	18.6	1.9306	0.0000	SURCHARGED
60 minute summer	OUTFALL HW	1	0.600	0.000	3.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	HW2.14	Flow through pond	2.17	18.6	0.035	0.001	830.8435	
2880 minute winter	2.17	Pump	OUTFALL HW	4.7				612.2

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Results for 30 year Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	2.0	2760	1.832	0.532	4.4	3.8060	0.0000	SURCHARGED
2880 minute winter	2.1	2760	1.831	0.605	11.1	1.0691	0.0000	SURCHARGED
2880 minute winter	2.2	2760	1.834	0.646	8.4	1.4155	0.0000	SURCHARGED
2880 minute winter	2.3	2760	1.825	0.550	2.0	2.3157	0.0000	SURCHARGED
2880 minute winter	2.4	2760	1.824	0.614	3.6	1.8679	0.0000	SURCHARGED
2880 minute winter	HW2.0	2520	1.783	0.763	9.3	0.0061	0.0000	OK
2880 minute winter	HW2.1	2700	1.825	0.805	3.7	0.0064	0.0000	OK
2880 minute winter	2.5	2640	1.838	0.588	6.8	6.5911	0.0000	SURCHARGED
2880 minute winter	2.6	2640	1.837	0.642	12.0	2.2917	0.0000	SURCHARGED
2880 minute winter	2.7	2640	1.835	0.694	14.8	2.4695	0.0000	SURCHARGED
2880 minute winter	2.8	2760	1.835	0.749	14.2	2.7959	0.0000	SURCHARGED
2880 minute winter	2.9	2760	1.839	0.797	16.8	2.0284	0.0000	SURCHARGED
2880 minute winter	HW2.5	2640	1.862	0.850	21.6	0.0068	0.0000	OK
60 minute summer	2.10	34	1.845	0.595	143.2	6.8683	0.0000	SURCHARGED
2880 minute winter	2.11	2820	1.841	0.635	13.2	2.5084	0.0000	SURCHARGED
2880 minute winter	2.12	2820	1.841	0.678	10.8	2.7640	0.0000	SURCHARGED
2880 minute winter	2.13	2820	1.841	0.757	12.2	2.4755	0.0000	SURCHARGED
2880 minute winter	HW2.10	2700	1.852	0.832	23.8	0.0067	0.0000	OK
2880 minute winter	2.14	2700	1.821	0.571	7.0	6.5764	0.0000	SURCHARGED
2880 minute winter	2.15	2760	1.821	0.629	8.3	2.4751	0.0000	SURCHARGED
2880 minute winter	2.16	2760	1.822	0.685	9.3	2.5496	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)
2880 minute winter	2.0	2.000	2.1	11.0	0.408	0.069	4.7184	
2880 minute winter	2.1	2.001	2.2	8.2	0.400	0.051	2.4316	
2880 minute winter	2.2	2.002	HW2.0	9.3	0.460	0.049	1.9931	
2880 minute winter	2.3	2.003	2.4	2.5	0.416	0.066	0.4791	
2880 minute winter	2.4	2.004	HW2.1	3.6	0.556	0.081	0.1784	
2880 minute winter	HW2.0	Flow through pond	2.17	45.4	0.055	0.003	1920.9301	
2880 minute winter	HW2.1	Flow through pond	2.17	45.4	0.055	0.003	1920.9301	
2880 minute winter	2.5	2.005	2.6	11.7	0.480	0.065	2.7932	
2880 minute winter	2.6	2.006	2.7	14.0	0.466	0.079	2.7720	
2880 minute winter	2.7	2.007	2.8	13.2	0.451	0.073	2.7848	
2880 minute winter	2.8	2.008	2.9	9.6	0.437	0.054	2.2545	
2880 minute winter	2.9	2.009	HW2.5	14.7	0.418	0.083	1.5409	
2880 minute winter	HW2.5	Flow through pond	2.17	45.4	0.055	0.003	1920.9301	
60 minute summer	2.10	2.010	2.11	133.4	0.842	0.835	2.8121	
2880 minute winter	2.11	2.011	2.12	9.9	0.449	0.062	2.7742	
2880 minute winter	2.12	2.012	2.13	11.6	0.427	0.073	5.0426	
2880 minute winter	2.13	2.013	HW2.10	19.3	0.489	0.121	1.5348	
2880 minute winter	HW2.10	Flow through pond	2.17	45.4	0.055	0.003	1920.9301	
2880 minute winter	2.14	2.014	2.15	7.2	0.482	0.040	2.9553	
2880 minute winter	2.15	2.015	2.16	8.3	0.476	0.046	2.7789	
2880 minute winter	2.16	2.016	HW2.14	9.1	0.471	0.050	4.6923	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	HW2.14	2460	1.829	0.809	15.1	1.6642	0.0000	OK
2880 minute winter	2.17	2820	1.822	1.022	45.4	3.5404	0.0000	SURCHARGED
60 minute summer	OUTFALL HW	1	0.600	0.000	4.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	HW2.14	Flow through pond	2.17	45.4	0.055	0.003	1920.9301	
2880 minute winter	2.17	Pump	OUTFALL HW	4.7				686.9

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	2.0	2820	2.403	1.103	7.4	44.9947	0.0000	FLOOD RISK
2880 minute winter	2.1	2820	2.405	1.179	13.1	2.0831	0.0000	FLOOD RISK
2880 minute winter	2.2	2820	2.401	1.213	20.1	2.6563	0.0000	FLOOD RISK
60 minute summer	2.3	34	2.437	1.162	77.0	4.8903	0.0000	FLOOD RISK
2880 minute winter	2.4	2820	2.380	1.170	5.6	3.5601	0.0000	SURCHARGED
2880 minute winter	HW2.0	2820	2.419	1.399	58.1	0.0112	0.0000	OK
2880 minute winter	HW2.1	2820	2.377	1.357	6.1	0.0109	0.0000	OK
2880 minute winter	2.5	2760	2.399	1.149	12.4	38.8840	0.0000	FLOOD RISK
2880 minute winter	2.6	2760	2.400	1.205	18.1	4.3012	0.0000	FLOOD RISK
2880 minute winter	2.7	2760	2.399	1.258	19.5	4.4784	0.0000	FLOOD RISK
2880 minute winter	2.8	2760	2.398	1.312	20.5	4.8996	0.0000	FLOOD RISK
2880 minute winter	2.9	2760	2.397	1.355	22.1	3.4480	0.0000	FLOOD RISK
2880 minute winter	HW2.5	2820	2.423	1.411	22.2	0.0113	0.0000	OK
60 minute summer	2.10	37	2.423	1.173	269.0	48.6779	0.0000	FLOOD RISK
2880 minute winter	2.11	2880	2.397	1.191	16.4	4.7064	0.0000	FLOOD RISK
2880 minute winter	2.12	2880	2.397	1.234	19.9	5.0311	0.0000	FLOOD RISK
2880 minute winter	2.13	2880	2.397	1.313	20.8	4.2928	0.0000	FLOOD RISK
2880 minute winter	HW2.10	2880	2.409	1.389	27.8	0.0111	0.0000	OK
2880 minute winter	2.14	2820	2.382	1.132	11.9	42.8950	0.0000	FLOOD RISK
2880 minute winter	2.15	2820	2.383	1.191	13.7	4.6890	0.0000	FLOOD RISK
2880 minute winter	2.16	2820	2.382	1.245	15.1	4.6327	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)
2880 minute winter	2.0	2.000	2.1	13.1	0.405	0.082	4.7184	
2880 minute winter	2.1	2.001	2.2	19.5	0.396	0.122	2.4316	
2880 minute winter	2.2	2.002	HW2.0	20.0	0.449	0.105	1.9931	
60 minute summer	2.3	2.003	2.4	71.2	1.791	1.872	0.4791	
2880 minute winter	2.4	2.004	HW2.1	5.3	0.555	0.116	0.1784	
2880 minute winter	HW2.0	Flow through pond	2.17	49.0	0.050	0.003	3543.1011	
2880 minute winter	HW2.1	Flow through pond	2.17	49.0	0.050	0.003	3543.1011	
2880 minute winter	2.5	2.005	2.6	17.8	0.479	0.099	2.7932	
2880 minute winter	2.6	2.006	2.7	19.2	0.448	0.107	2.7720	
2880 minute winter	2.7	2.007	2.8	20.2	0.425	0.112	2.7848	
2880 minute winter	2.8	2.008	2.9	22.1	0.429	0.124	2.2545	
2880 minute winter	2.9	2.009	HW2.5	22.2	0.444	0.124	1.5409	
2880 minute winter	HW2.5	Flow through pond	2.17	49.0	0.050	0.003	3543.1011	
60 minute summer	2.10	2.010	2.11	179.0	1.130	1.121	2.8121	
2880 minute winter	2.11	2.011	2.12	17.7	0.439	0.111	2.7742	
2880 minute winter	2.12	2.012	2.13	19.7	0.402	0.123	5.0426	
2880 minute winter	2.13	2.013	HW2.10	27.8	0.449	0.174	1.5348	
2880 minute winter	HW2.10	Flow through pond	2.17	49.0	0.050	0.003	3543.1011	
2880 minute winter	2.14	2.014	2.15	11.8	0.482	0.066	2.9553	
2880 minute winter	2.15	2.015	2.16	13.4	0.466	0.074	2.7789	
2880 minute winter	2.16	2.016	HW2.14	15.6	0.461	0.085	4.6923	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 95.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute winter	HW2.14	4260	2.383	1.363	26.6	2.8044	0.0000	OK
2880 minute winter	2.17	2820	2.379	1.579	49.0	5.4699	0.0000	SURCHARGED
60 minute summer	OUTFALL HW	1	0.600	0.000	4.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute winter	HW2.14	Flow through pond	2.17	52.0	0.052	0.003	3484.5437	
2880 minute winter	2.17	Pump	OUTFALL HW	4.7				738.6

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	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	✓

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)
2.000	2.0	2.1	29.780	0.600	1.300	1.226	0.074	405.0	450	5.49	49.9
2.001	2.1	2.2	15.347	0.600	1.226	1.188	0.038	405.0	450	5.75	48.9
2.002	2.2	HW2.0	12.579	0.600	1.188	1.144	0.044	285.9	450	5.92	48.2
2.003	2.3	2.4	12.046	0.600	1.275	1.210	0.065	185.3	225	5.21	50.0
2.004	2.4	HW2.1	4.486	0.600	1.210	1.176	0.034	131.9	225	5.28	50.0
2.005	2.5	2.6	17.629	0.600	1.250	1.195	0.055	320.5	450	5.26	50.0
2.006	2.6	2.7	17.495	0.600	1.195	1.141	0.054	324.0	450	5.52	49.8
2.007	2.7	2.8	17.576	0.600	1.141	1.086	0.055	319.6	450	5.78	48.8
2.008	2.8	2.9	14.229	0.600	1.086	1.042	0.044	323.4	450	5.99	48.0
2.009	2.9	HW2.5	9.725	0.600	1.042	1.012	0.030	324.2	450	6.13	47.4
2.010	2.10	2.11	17.748	0.600	1.250	1.206	0.044	405.0	450	5.29	50.0
2.011	2.11	2.12	17.509	0.600	1.206	1.163	0.043	405.0	450	5.59	49.5
2.012	2.12	2.13	31.826	0.600	1.163	1.084	0.079	405.0	450	6.11	47.5
2.013	2.13	HW2.10	9.687	0.600	1.084	1.060	0.024	405.0	450	6.27	46.9
2.014	2.14	2.15	18.652	0.600	1.250	1.192	0.058	321.6	450	5.28	50.0
2.015	2.15	2.16	17.539	0.600	1.192	1.137	0.055	318.9	450	5.53	49.7
2.016	2.16	HW2.14	29.615	0.600	1.137	1.042	0.095	311.7	450	5.96	48.0

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)
2.000	1.004	159.6	51.0	0.950	1.024	0.377	0.0	174	0.897
2.001	1.004	159.6	49.9	1.024	1.062	0.377	0.0	173	0.892
2.002	1.197	190.4	53.4	1.062	1.006	0.409	0.0	162	1.032
2.003	0.957	38.0	23.6	1.200	1.265	0.174	0.0	129	1.008
2.004	1.136	45.2	36.5	1.265	1.199	0.269	0.0	153	1.260
2.005	1.130	179.7	79.3	0.900	0.955	0.585	0.0	209	1.095
2.006	1.124	178.7	88.7	0.955	1.009	0.657	0.0	224	1.121
2.007	1.132	180.0	96.6	1.009	1.064	0.731	0.0	235	1.151
2.008	1.125	178.9	106.7	1.064	1.108	0.821	0.0	251	1.172
2.009	1.123	178.7	105.5	1.108	1.138	0.821	0.0	249	1.168
2.010	1.004	159.6	82.4	0.900	0.944	0.608	0.0	229	1.011
2.011	1.004	159.6	94.8	0.944	0.987	0.706	0.0	250	1.045
2.012	1.004	159.6	105.0	0.987	1.066	0.816	0.0	267	1.068
2.013	1.004	159.6	110.7	1.066	1.090	0.871	0.0	276	1.081
2.014	1.128	179.4	82.1	0.900	0.958	0.606	0.0	214	1.105
2.015	1.133	180.2	94.9	0.958	1.013	0.704	0.0	232	1.148
2.016	1.146	182.2	102.9	1.013	1.108	0.790	0.0	242	1.179

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.017	2.17	OUTFALL HW	121.728	0.600	0.800	0.600	0.200	608.6	300	8.22	40.9

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)
2.017	0.630	44.5	0.0	1.600	1.800	0.000	0.0	0	0.000

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	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 %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 2.17 Online Pump Control

Flap Valve	x	Design Depth (m)	1.650	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	4.7		
Invert Level (m)	0.800	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.000	0.500	4.700

Node 2.17 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	220.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.800	Main Channel Slope (1:X)	1000.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.033

Inlets

HW2.0	HW2.1	HW2.5	HW2.10	HW2.14

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1595.0	0.0	1.800	3584.0	0.0

Node 2.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	520.0	0.0	0.350	520.0	0.0	0.351	0.0	0.0

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Node 2.5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	5

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	248.0	0.0	0.350	248.0	0.0	0.351	0.0	0.0

Node 2.10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	5

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	310.0	0.0	0.350	310.0	0.0	0.351	0.0	0.0

Node 2.14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	4

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	302.0	0.0	0.350	302.0	0.0	0.351	0.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	2.0	10	1.510	0.210	65.2	1.5045	0.0000	OK
15 minute winter	2.1	11	1.441	0.215	63.1	0.3796	0.0000	OK
15 minute winter	2.2	11	1.390	0.202	68.6	0.4423	0.0000	OK
15 minute winter	2.3	11	1.469	0.194	30.1	0.8168	0.0000	OK
15 minute winter	2.4	11	1.428	0.218	44.6	0.6638	0.0000	OK
1440 minute winter	HW2.0	1380	1.317	0.297	4.2	0.0024	0.0000	OK
1440 minute winter	HW2.1	1380	1.323	0.303	7.0	0.0024	0.0000	OK
15 minute winter	2.5	11	1.546	0.296	101.1	3.3218	0.0000	OK
15 minute winter	2.6	11	1.516	0.321	107.8	1.1448	0.0000	OK
15 minute winter	2.7	11	1.482	0.341	116.7	1.2144	0.0000	OK
15 minute winter	2.8	12	1.447	0.361	129.3	1.3475	0.0000	OK
15 minute winter	2.9	12	1.408	0.366	127.0	0.9315	0.0000	OK
15 minute winter	HW2.5	12	1.372	0.360	124.9	0.0029	0.0000	OK
15 minute winter	2.10	11	1.582	0.332	105.1	3.8384	0.0000	OK
15 minute winter	2.11	11	1.554	0.348	114.7	1.3736	0.0000	OK
15 minute winter	2.12	11	1.516	0.353	129.8	1.4382	0.0000	OK
15 minute winter	2.13	12	1.453	0.369	136.3	1.2057	0.0000	OK
15 minute winter	HW2.10	12	1.407	0.387	133.4	0.0031	0.0000	OK
15 minute winter	2.14	11	1.550	0.300	104.8	3.4539	0.0000	OK
15 minute winter	2.15	11	1.515	0.323	115.8	1.2706	0.0000	OK
15 minute winter	2.16	11	1.471	0.334	127.7	1.2428	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	2.0	2.000	2.1	63.1	0.870	0.396	2.1821	
15 minute winter	2.1	2.001	2.2	63.4	0.883	0.397	1.1018	
15 minute winter	2.2	2.002	HW2.0	68.6	1.069	0.361	0.8078	
15 minute winter	2.3	2.003	2.4	28.7	0.771	0.754	0.4568	
15 minute winter	2.4	2.004	HW2.1	44.4	1.203	0.983	0.1632	
1440 minute winter	HW2.0	Flow through pond	2.17	18.2	0.055	0.001	731.7793	
1440 minute winter	HW2.1	Flow through pond	2.17	18.2	0.055	0.001	731.7793	
15 minute winter	2.5	2.005	2.6	95.4	0.888	0.531	2.0408	
15 minute winter	2.6	2.006	2.7	104.7	0.896	0.586	2.1852	
15 minute winter	2.7	2.007	2.8	114.7	0.895	0.638	2.3247	
15 minute winter	2.8	2.008	2.9	127.0	0.946	0.710	1.9518	
15 minute winter	2.9	2.009	HW2.5	124.9	0.931	0.699	1.3331	
15 minute winter	HW2.5	Flow through pond	2.17	311.8	0.292	0.018	262.9130	
15 minute winter	2.10	2.010	2.11	97.8	0.819	0.613	2.2799	
15 minute winter	2.11	2.011	2.12	112.0	0.883	0.701	2.3180	
15 minute winter	2.12	2.012	2.13	127.5	0.956	0.798	4.3188	
15 minute winter	2.13	2.013	HW2.10	133.4	1.002	0.836	1.3093	
15 minute winter	HW2.10	Flow through pond	2.17	311.8	0.292	0.018	262.9130	
15 minute winter	2.14	2.014	2.15	98.9	0.898	0.551	2.1807	
15 minute winter	2.15	2.015	2.16	113.7	0.959	0.631	2.1738	
15 minute winter	2.16	2.016	HW2.14	126.3	0.951	0.693	3.9281	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	HW2.14	11	1.411	0.391	152.7	0.8045	0.0000	OK
1440 minute winter	2.17	1320	1.309	0.509	18.2	1.7634	0.0000	SURCHARGED
15 minute summer	OUTFALL HW	1	0.600	0.000	3.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	HW2.14	Flow through pond	2.17	311.8	0.292	0.018	262.9130	
1440 minute winter	2.17	Pump	OUTFALL HW	4.7				318.8

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Results for 30 year Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	2.0	10	1.621	0.321	123.3	2.2975	0.0000	OK
1440 minute winter	2.1	1350	1.600	0.374	5.8	0.6609	0.0000	OK
1440 minute winter	2.2	1350	1.602	0.414	6.0	0.9065	0.0000	OK
15 minute winter	2.3	11	1.825	0.550	56.9	2.3161	0.0000	SURCHARGED
15 minute winter	2.4	11	1.655	0.445	83.0	1.3524	0.0000	SURCHARGED
1440 minute winter	HW2.0	1350	1.608	0.588	32.8	0.0047	0.0000	OK
1440 minute winter	HW2.1	1350	1.600	0.580	4.1	0.0046	0.0000	OK
15 minute winter	2.5	11	2.067	0.817	191.4	9.1578	0.0000	SURCHARGED
15 minute winter	2.6	12	1.994	0.799	190.4	2.8525	0.0000	SURCHARGED
15 minute winter	2.7	12	1.907	0.766	209.4	2.7259	0.0000	SURCHARGED
15 minute winter	2.8	12	1.798	0.712	233.7	2.6574	0.0000	SURCHARGED
15 minute winter	2.9	12	1.677	0.635	230.6	1.6151	0.0000	SURCHARGED
1440 minute winter	HW2.5	1380	1.642	0.630	12.0	0.0050	0.0000	OK
15 minute winter	2.10	12	2.119	0.869	198.9	12.1183	0.0000	SURCHARGED
15 minute winter	2.11	12	2.049	0.843	193.0	3.3322	0.0000	SURCHARGED
15 minute winter	2.12	12	1.958	0.795	216.9	3.2401	0.0000	SURCHARGED
15 minute winter	2.13	12	1.775	0.691	233.0	2.2593	0.0000	SURCHARGED
15 minute winter	HW2.10	12	1.676	0.656	232.7	0.0052	0.0000	OK
15 minute winter	2.14	11	2.081	0.831	198.3	9.5767	0.0000	SURCHARGED
15 minute winter	2.15	11	1.992	0.800	206.7	3.1493	0.0000	SURCHARGED
15 minute winter	2.16	11	1.878	0.741	229.9	2.7551	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)
15 minute winter	2.0	2.000	2.1	119.5	0.999	0.748	3.5876	
1440 minute winter	2.1	2.001	2.2	5.6	0.474	0.035	2.2530	
1440 minute winter	2.2	2.002	HW2.0	7.3	0.534	0.038	1.9562	
15 minute winter	2.3	2.003	2.4	52.2	1.313	1.373	0.4791	
15 minute winter	2.4	2.004	HW2.1	80.9	2.034	1.790	0.1784	
1440 minute winter	HW2.0	Flow through pond	2.17	26.9	0.062	0.002	1367.6522	
1440 minute winter	HW2.1	Flow through pond	2.17	26.9	0.062	0.002	1367.6522	
15 minute winter	2.5	2.005	2.6	168.2	1.062	0.936	2.7932	
15 minute winter	2.6	2.006	2.7	186.6	1.178	1.044	2.7720	
15 minute winter	2.7	2.007	2.8	205.9	1.300	1.144	2.7848	
15 minute winter	2.8	2.008	2.9	230.6	1.455	1.289	2.2545	
15 minute winter	2.9	2.009	HW2.5	228.7	1.444	1.280	1.5409	
1440 minute winter	HW2.5	Flow through pond	2.17	26.9	0.062	0.002	1367.6522	
15 minute winter	2.10	2.010	2.11	163.5	1.032	1.024	2.8121	
15 minute winter	2.11	2.011	2.12	183.8	1.160	1.152	2.7742	
15 minute winter	2.12	2.012	2.13	216.0	1.364	1.353	5.0426	
15 minute winter	2.13	2.013	HW2.10	232.7	1.469	1.458	1.5348	
15 minute winter	HW2.10	Flow through pond	2.17	764.6	0.413	0.045	495.7605	
15 minute winter	2.14	2.014	2.15	176.5	1.114	0.984	2.9553	
15 minute winter	2.15	2.015	2.16	203.4	1.284	1.129	2.7789	
15 minute winter	2.16	2.016	HW2.14	227.2	1.434	1.247	4.6923	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	HW2.14	12	1.676	0.656	277.1	1.3501	0.0000	OK
1440 minute winter	2.17	1410	1.599	0.799	26.9	2.7667	0.0000	SURCHARGED
15 minute summer	OUTFALL HW	1	0.600	0.000	3.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	HW2.14	Flow through pond	2.17	764.6	0.413	0.045	495.7605	
1440 minute winter	2.17	Pump	OUTFALL HW	4.7				358.1

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	2.0	1380	2.022	0.722	9.5	5.1676	0.0000	SURCHARGED
1440 minute winter	2.1	1380	2.021	0.795	14.9	1.4048	0.0000	SURCHARGED
1440 minute winter	2.2	1410	2.026	0.838	16.4	1.8343	0.0000	SURCHARGED
15 minute winter	2.3	11	2.700	1.425	95.9	5.9978	0.6654	FLOOD
15 minute winter	2.4	12	2.313	1.103	128.5	3.3551	0.0000	SURCHARGED
960 minute winter	HW2.0	990	2.013	0.993	53.4	0.0079	0.0000	OK
1440 minute winter	HW2.1	1410	2.017	0.997	9.0	0.0080	0.0000	OK
15 minute winter	2.5	13	2.472	1.222	322.6	44.1675	0.0000	FLOOD RISK
15 minute winter	2.6	13	2.373	1.178	214.6	4.2060	0.0000	FLOOD RISK
15 minute winter	2.7	13	2.245	1.104	238.6	3.9308	0.0000	SURCHARGED
15 minute winter	2.8	13	2.089	1.003	273.0	3.7433	0.0000	SURCHARGED
1440 minute winter	2.9	1410	2.035	0.993	26.9	2.5280	0.0000	SURCHARGED
1440 minute winter	HW2.5	1440	2.057	1.045	30.7	0.0084	0.0000	OK
15 minute winter	2.10	13	2.583	1.333	335.3	53.4863	0.0000	FLOOD RISK
15 minute winter	2.11	13	2.485	1.279	223.9	5.0524	0.0000	FLOOD RISK
15 minute winter	2.12	13	2.350	1.187	258.2	4.8402	0.0000	FLOOD RISK
15 minute winter	2.13	13	2.084	1.000	273.5	3.2696	0.0000	SURCHARGED
1440 minute winter	HW2.10	1410	2.010	0.990	42.1	0.0079	0.0000	OK
15 minute winter	2.14	13	2.424	1.174	334.2	47.7777	0.0000	FLOOD RISK
15 minute winter	2.15	12	2.312	1.120	233.9	4.4075	0.0000	FLOOD RISK
15 minute winter	2.16	12	2.182	1.045	256.0	3.8864	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	2.0	2.000	2.1	14.9	0.490	0.094	4.7184	
1440 minute winter	2.1	2.001	2.2	15.8	0.478	0.099	2.4316	
1440 minute winter	2.2	2.002	HW2.0	20.7	0.546	0.109	1.9931	
15 minute winter	2.3	2.003	2.4	79.2	1.992	2.082	0.4791	
15 minute winter	2.4	2.004	HW2.1	123.3	3.101	2.729	0.1784	
960 minute winter	HW2.0	Flow through pond	2.17	63.6	0.087	0.004	2332.4146	
1440 minute winter	HW2.1	Flow through pond	2.17	52.5	0.071	0.003	2441.2849	
15 minute winter	2.5	2.005	2.6	200.7	1.267	1.117	2.7932	
15 minute winter	2.6	2.006	2.7	215.5	1.360	1.206	2.7720	
15 minute winter	2.7	2.007	2.8	237.4	1.499	1.319	2.7848	
15 minute winter	2.8	2.008	2.9	269.1	1.699	1.505	2.2545	
1440 minute winter	2.9	2.009	HW2.5	30.7	0.478	0.172	1.5409	
1440 minute winter	HW2.5	Flow through pond	2.17	52.5	0.071	0.003	2441.2849	
15 minute winter	2.10	2.010	2.11	200.3	1.264	1.255	2.8121	
15 minute winter	2.11	2.011	2.12	223.3	1.410	1.399	2.7742	
15 minute winter	2.12	2.012	2.13	256.1	1.616	1.604	5.0426	
15 minute winter	2.13	2.013	HW2.10	270.2	1.705	1.692	1.5348	
1440 minute winter	HW2.10	Flow through pond	2.17	52.5	0.071	0.003	2441.2849	
15 minute winter	2.14	2.014	2.15	221.8	1.400	1.236	2.9553	
15 minute winter	2.15	2.015	2.16	238.7	1.507	1.325	2.7789	
15 minute winter	2.16	2.016	HW2.14	259.0	1.635	1.421	4.6923	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 97.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	HW2.14	1410	2.017	0.997	25.1	2.0519	0.0000	OK
1440 minute winter	2.17	1440	2.014	1.214	52.5	4.2060	0.0000	SURCHARGED
15 minute summer	OUTFALL HW	1	0.600	0.000	4.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	HW2.14	Flow through pond	2.17	52.5	0.071	0.003	2441.2849	
1440 minute winter	2.17	Pump	OUTFALL HW	4.7				383.3

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	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

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)
3.000	3.0	3.1	31.483	0.600	1.500	1.369	0.131	240.0	300	5.52	49.8
3.001	3.1	3.2	58.462	0.600	1.369	1.125	0.244	239.6	300	6.48	46.2
3.002	3.2	3.3	31.503	0.600	0.675	0.630	0.045	700.0	750	8.06	41.4
3.003	3.3	HW OUTFALL	20.000	0.600	0.630	0.547	0.083	240.0	300	8.39	40.5
3.004	3.4	3.5	70.475	0.600	1.350	1.176	0.174	405.0	450	6.17	47.3
3.005	3.5	3.6	64.165	0.600	1.026	0.915	0.111	578.1	600	7.23	43.7
3.006	3.6	3.2	30.085	0.600	0.765	0.675	0.090	334.3	750	7.56	42.8
3.007	3.7	3.2	31.483	0.600	1.500	1.125	0.375	84.0	300	5.31	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)
3.000	1.010	71.4	48.7	0.900	1.031	0.361	0.0	182	1.084
3.001	1.011	71.5	60.3	1.031	1.275	0.482	0.0	212	1.129
3.002	1.050	463.8	296.6	1.275	1.320	2.645	0.0	437	1.110
3.003	1.010	71.4	290.4	1.770	1.853	2.645	0.0	300	1.023
3.004	1.004	159.6	80.9	0.900	1.074	0.631	0.0	226	1.006
3.005	1.005	284.3	149.6	1.074	1.185	1.262	0.0	310	1.018
3.006	1.525	673.6	219.4	1.185	1.275	1.893	0.0	293	1.370
3.007	1.717	121.4	22.4	0.900	1.275	0.165	0.0	87	1.321

Simulation Settings

Rainfall Methodology	FEH-99	E (1km)	0.303	Skip Steady State	x
C (1km)	-0.021	F (1km)	2.480	Drain Down Time (mins)	240
D1 (1km)	0.344	Summer CV	0.750	Additional Storage (m³/ha)	20.0
D2 (1km)	0.336	Winter CV	0.840	Check Discharge Rate(s)	x
D3 (1km)	0.239	Analysis Speed	Normal	Check Discharge Volume	x

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 3.3 Online Pump Control

Flap Valve	x	Design Depth (m)	1.300	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	3.7		
Invert Level (m)	0.630	Switch on depth (m)	0.100		

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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.250	2.000	0.500	3.700

Node 3.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.020
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	2250.0	0.0	0.550	2250.0	0.0	0.551	0.0	0.0

Node 3.4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.350
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	460.0	0.0	0.800	460.0	0.0	0.801	0.0	0.0

Node 3.5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.026
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	460.0	0.0	0.800	460.0	0.0	0.801	0.0	0.0

Node 3.6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.250
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	936.0	0.0	0.450	1109.0	0.0

Node 3.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.630
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	850.0	0.0	0.800	850.0	0.0	0.801	0.0	0.0

Node 3.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.369
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	83.0	0.0	1.335	346.0	0.0

Node 3.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	722.0	0.0	0.450	920.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 97.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	3.0	33	1.650	0.150	34.1	1.0695	0.0000	OK
60 minute summer	3.1	37	1.514	0.145	45.4	14.4776	0.0000	OK
2880 minute winter	3.2	2280	1.283	0.608	14.8	2.1770	0.0000	OK
2880 minute winter	3.3	2280	1.283	0.653	14.4	556.5123	0.0000	SURCHARGED
120 minute winter	3.4	80	1.451	0.101	30.9	47.6682	0.0000	OK
2880 minute winter	3.5	2280	1.283	0.257	7.4	120.5096	0.0000	OK
2880 minute winter	3.6	2280	1.283	0.518	10.8	4.6946	0.0000	OK
60 minute summer	3.7	33	1.574	0.074	15.6	0.2874	0.0000	OK
60 minute summer	HW OUTFALL	1	0.547	0.000	1.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	3.0	3.000	3.1	34.0	1.101	0.476	1.0296	
60 minute summer	3.1	3.001	3.2	32.5	0.995	0.455	1.9092	
2880 minute winter	3.2	3.002	3.3	14.4	0.435	0.031	12.4283	
2880 minute winter	3.3	Pump	HW OUTFALL	3.7				440.4
120 minute winter	3.4	3.004	3.5	17.1	0.707	0.107	1.7056	
2880 minute winter	3.5	3.005	3.6	7.1	0.456	0.025	9.5015	
2880 minute winter	3.6	3.006	3.2	10.4	0.273	0.015	10.6275	
60 minute summer	3.7	3.007	3.2	15.6	1.178	0.128	0.4166	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 97.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	3.0	2760	2.079	0.579	4.2	4.1362	0.0000	SURCHARGED
2880 minute winter	3.1	2760	2.079	0.710	5.6	110.5968	0.0000	SURCHARGED
2880 minute winter	3.2	2760	2.079	1.404	20.3	51.5771	0.0000	SURCHARGED
2880 minute winter	3.3	2760	2.079	1.449	19.7	684.1117	0.0000	SURCHARGED
2880 minute winter	3.4	2760	2.079	0.729	11.0	343.2648	0.0000	SURCHARGED
2880 minute winter	3.5	2760	2.079	1.053	16.0	378.0256	0.0000	SURCHARGED
2880 minute winter	3.6	2760	2.079	1.314	13.6	11.9105	0.0000	SURCHARGED
2880 minute winter	3.7	2760	2.079	0.579	1.9	2.2456	0.0000	SURCHARGED
60 minute summer	HW OUTFALL	1	0.547	0.000	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	3.0	3.000	3.1	4.2	0.510	0.059	2.2170	
2880 minute winter	3.1	3.001	3.2	5.6	0.579	0.078	4.1169	
2880 minute winter	3.2	3.002	3.3	19.7	0.520	0.043	13.8651	
2880 minute winter	3.3	Pump	HW OUTFALL	3.7				505.9
2880 minute winter	3.4	3.004	3.5	7.1	0.529	0.045	11.1663	
2880 minute winter	3.5	3.005	3.6	-9.0	0.466	-0.032	18.0738	
2880 minute winter	3.6	3.006	3.2	13.0	0.321	0.019	13.2410	
2880 minute winter	3.7	3.007	3.2	1.9	0.579	0.016	2.2170	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 97.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	3.0	2820	2.685	1.185	7.1	8.4708	0.0000	FLOOD RISK
2880 minute winter	3.1	2820	2.685	1.316	13.6	283.7169	0.0000	FLOOD RISK
2880 minute winter	3.2	2820	2.685	2.010	38.8	441.1124	0.0000	FLOOD RISK
2880 minute winter	3.3	2820	2.685	2.055	24.6	1041.7330	0.0000	FLOOD RISK
2880 minute winter	3.4	2820	2.685	1.335	32.3	383.0689	0.0000	FLOOD RISK
2880 minute winter	3.5	2820	2.685	1.659	26.8	383.6689	0.0000	FLOOD RISK
2880 minute winter	3.6	2820	2.685	1.920	34.3	461.4383	0.0000	FLOOD RISK
2880 minute winter	3.7	2820	2.685	1.185	3.2	4.5991	0.0000	FLOOD RISK
60 minute summer	HW OUTFALL	1	0.547	0.000	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	3.0	3.000	3.1	6.9	0.546	0.096	2.2170	
2880 minute winter	3.1	3.001	3.2	7.0	0.581	0.098	4.1169	
2880 minute winter	3.2	3.002	3.3	24.6	0.567	0.053	13.8651	
2880 minute winter	3.3	Pump	HW OUTFALL	3.7				552.2
2880 minute winter	3.4	3.004	3.5	-19.9	0.543	-0.125	11.1663	
2880 minute winter	3.5	3.005	3.6	22.4	0.459	0.079	18.0738	
2880 minute winter	3.6	3.006	3.2	33.8	0.359	0.050	13.2410	
2880 minute winter	3.7	3.007	3.2	3.2	0.579	0.027	2.2170	

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	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

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)
3.000	3.0	3.1	31.483	0.600	1.500	1.369	0.131	240.0	300	5.52	49.8
3.001	3.1	3.2	58.462	0.600	1.369	1.125	0.244	239.6	300	6.48	46.2
3.002	3.2	3.3	31.503	0.600	0.675	0.630	0.045	700.0	750	8.06	41.4
3.003	3.3	HW OUTFALL	20.000	0.600	0.630	0.547	0.083	240.0	300	8.39	40.5
3.004	3.4	3.5	70.475	0.600	1.350	1.176	0.174	405.0	450	6.17	47.3
3.005	3.5	3.6	64.165	0.600	1.026	0.915	0.111	578.1	600	7.23	43.7
3.006	3.6	3.2	30.085	0.600	0.765	0.675	0.090	334.3	750	7.56	42.8
3.007	3.7	3.2	31.483	0.600	1.500	1.125	0.375	84.0	300	5.31	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)
3.000	1.010	71.4	48.7	0.900	1.031	0.361	0.0	182	1.084
3.001	1.011	71.5	60.3	1.031	1.275	0.482	0.0	212	1.129
3.002	1.050	463.8	296.6	1.275	1.320	2.645	0.0	437	1.110
3.003	1.010	71.4	290.4	1.770	1.853	2.645	0.0	300	1.023
3.004	1.004	159.6	80.9	0.900	1.074	0.631	0.0	226	1.006
3.005	1.005	284.3	149.6	1.074	1.185	1.262	0.0	310	1.018
3.006	1.525	673.6	219.4	1.185	1.275	1.893	0.0	293	1.370
3.007	1.717	121.4	22.4	0.900	1.275	0.165	0.0	87	1.321

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	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 %)
2	0	0	0	100	30	0	0
30	0	0	0				

Node 3.3 Online Pump Control

Flap Valve	x	Design Depth (m)	1.300	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	3.7		
Invert Level (m)	0.630	Switch on depth (m)	0.100		

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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.250	2.000	0.500	3.700

Node 3.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.020
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	2250.0	0.0	0.550	2250.0	0.0	0.551	0.0	0.0

Node 3.4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.350
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	460.0	0.0	0.800	460.0	0.0	0.801	0.0	0.0

Node 3.5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.026
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	460.0	0.0	0.800	460.0	0.0	0.801	0.0	0.0

Node 3.6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	936.0	0.0	0.450	1109.0	0.0

Node 3.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.630
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	850.0	0.0	0.800	850.0	0.0	0.801	0.0	0.0

Node 3.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.369
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	83.0	0.0	1.335	346.0	0.0

Node 3.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	722.0	0.0	0.450	920.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 97.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	3.0	10	1.712	0.212	62.3	1.5147	0.0000	OK
15 minute winter	3.1	14	1.545	0.176	81.8	18.2219	0.0000	OK
15 minute winter	3.2	11	1.260	0.585	191.8	2.0972	0.0000	OK
1440 minute winter	3.3	1380	1.210	0.580	22.0	494.1003	0.0000	SURCHARGED
60 minute winter	3.4	45	1.462	0.112	55.5	52.6969	0.0000	OK
1440 minute winter	3.5	1380	1.210	0.184	10.8	86.1604	0.0000	OK
15 minute winter	3.6	11	1.268	0.503	109.0	4.5634	0.0000	OK
15 minute winter	3.7	10	1.601	0.101	28.5	0.3921	0.0000	OK
15 minute summer	HW OUTFALL	1	0.547	0.000	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	3.0	3.000	3.1	60.9	1.563	0.853	1.3865	
15 minute winter	3.1	3.001	3.2	44.8	1.087	0.626	2.4072	
15 minute winter	3.2	3.002	3.3	256.6	2.337	0.553	5.8456	
1440 minute winter	3.3	Pump	HW OUTFALL	3.7				230.8
60 minute winter	3.4	3.004	3.5	20.9	0.746	0.131	1.9762	
1440 minute winter	3.5	3.005	3.6	11.1	0.535	0.039	6.7553	
15 minute winter	3.6	3.006	3.2	118.6	0.715	0.176	10.2742	
15 minute winter	3.7	3.007	3.2	28.4	1.327	0.234	0.7901	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 97.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	3.0	11	1.999	0.499	118.2	3.5677	0.0000	SURCHARGED
15 minute winter	3.1	14	1.663	0.294	150.1	33.7910	0.0000	OK
1440 minute winter	3.2	1410	1.609	0.934	33.3	3.3474	0.0000	SURCHARGED
1440 minute winter	3.3	1410	1.609	0.979	32.4	682.9178	0.0000	SURCHARGED
1440 minute winter	3.4	1410	1.610	0.260	10.2	122.2640	0.0000	OK
1440 minute winter	3.5	1410	1.610	0.584	19.1	273.8451	0.0000	OK
1440 minute winter	3.6	1410	1.609	0.844	24.3	7.6571	0.0000	SURCHARGED
15 minute winter	3.7	10	1.638	0.138	54.1	0.5358	0.0000	OK
15 minute summer	HW OUTFALL	1	0.547	0.000	2.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	3.0	3.000	3.1	112.9	1.663	1.580	2.2042	
15 minute winter	3.1	3.001	3.2	77.7	1.226	1.087	3.6486	
1440 minute winter	3.2	3.002	3.3	32.4	0.601	0.070	13.8651	
1440 minute winter	3.3	Pump	HW OUTFALL	3.7				259.5
1440 minute winter	3.4	3.004	3.5	9.9	0.597	0.062	8.8547	
1440 minute winter	3.5	3.005	3.6	15.6	0.565	0.055	18.0060	
1440 minute winter	3.6	3.006	3.2	23.1	0.345	0.034	13.2410	
15 minute winter	3.7	3.007	3.2	53.5	1.579	0.441	1.5826	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 97.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	3.0	11	2.700	1.200	198.9	8.5776	0.8339	FLOOD
1440 minute winter	3.1	1440	2.317	0.948	13.3	169.9390	0.0000	SURCHARGED
1440 minute winter	3.2	1440	2.317	1.642	40.7	239.9737	0.0000	SURCHARGED
1440 minute winter	3.3	1440	2.317	1.687	39.6	734.2625	0.0000	SURCHARGED
1440 minute winter	3.4	1440	2.317	0.967	31.0	378.9751	0.0000	SURCHARGED
1440 minute winter	3.5	1440	2.317	1.291	64.5	380.2416	0.0000	SURCHARGED
1440 minute winter	3.6	1440	2.317	1.552	55.0	77.8759	0.0000	SURCHARGED
1440 minute winter	3.7	1440	2.317	0.817	4.2	3.1698	0.0000	SURCHARGED
15 minute summer	HW OUTFALL	1	0.547	0.000	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	3.0	3.000	3.1	173.6	2.466	2.431	2.2170	
1440 minute winter	3.1	3.001	3.2	11.5	0.696	0.160	4.1169	
1440 minute winter	3.2	3.002	3.3	39.6	0.687	0.085	13.8651	
1440 minute winter	3.3	Pump	HW OUTFALL	3.7				283.0
1440 minute winter	3.4	3.004	3.5	-19.0	0.639	-0.119	11.1663	
1440 minute winter	3.5	3.005	3.6	-48.6	0.550	-0.171	18.0738	
1440 minute winter	3.6	3.006	3.2	-39.1	0.383	-0.058	13.2410	
1440 minute winter	3.7	3.007	3.2	4.2	0.714	0.035	2.2170	

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	Minimum Backdrop Height (m)	9.000
Ratio-R	0.400	Preferred Cover Depth (m)	0.900
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

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)
4.000	4.0	4.1	85.814	0.600	1.275	1.102	0.173	495.0	525	6.43	46.4
4.001	4.1	4.2	85.759	0.600	1.027	0.862	0.165	520.0	600	7.78	42.1
4.002	4.2	HW4.0	20.367	0.600	0.862	0.823	0.039	520.0	600	8.10	41.3
4.003	4.4	4.5	44.037	0.600	1.350	1.240	0.110	400.0	450	5.73	49.0
4.004	4.5	4.6	56.464	0.600	1.165	1.047	0.118	480.0	525	6.65	45.6
4.005	4.6	4.7	89.853	0.600	1.047	0.860	0.187	480.0	525	8.13	41.2
4.006	4.7	HW4.2	17.715	0.600	0.860	0.823	0.037	480.0	525	8.42	40.4
4.007	OUTFALL HW	OUTFALL	17.348	0.600	0.650	0.578	0.072	240.0	300	5.29	50.0
4.008	4.3	4.2	39.294	0.600	1.400	1.087	0.313	125.5	375	5.41	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)
4.000	1.000	216.4	167.4	0.900	1.073	1.332	0.0
4.001	1.061	299.9	270.8	1.073	1.238	2.370	0.0
4.002	1.061	299.9	301.9	1.238	1.277	2.699	0.0
4.003	1.010	160.7	35.6	0.900	1.010	0.268	0.0
4.004	1.015	219.8	66.4	1.010	1.128	0.537	0.0
4.005	1.015	219.8	60.0	1.128	1.315	0.537	0.0
4.006	1.015	219.8	58.9	1.315	1.352	0.537	0.0
4.007	1.010	71.4	0.0	1.750	1.822	0.000	0.0
4.008	1.615	178.4	44.6	0.925	1.238	0.329	0.0

Simulation Settings

Rainfall Methodology	FEH-99	E (1km)	0.303	Skip Steady State	x
C (1km)	-0.021	F (1km)	2.480	Drain Down Time (mins)	240
D1 (1km)	0.344	Summer CV	0.750	Additional Storage (m³/ha)	20.0
D2 (1km)	0.336	Winter CV	0.840	Check Discharge Rate(s)	x
D3 (1km)	0.239	Analysis Speed	Normal	Check Discharge Volume	x

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	30	0	0
30	0	0	0				

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Node OUTFALL Online Pump Control

Flap Valve	x	Design Depth (m)	1.770	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	4.5		
Invert Level (m)	0.578	Switch on depth (m)	0.150		

Depth (m)	Flow (l/s)
1.770	4.500

Node OUTFALL HW Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	60.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.650	Main Channel Slope (1:X)	600.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.033

Inlets: HW4.0, HW4.2

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1566.0	0.0	2.000	2782.0	0.0

Node 4.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.275
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	24

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	205.0	0.0	1.425	628.0	0.0

Node 4.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	8

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	84.0	0.0	0.450	582.0	0.0	0.451	0.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 95.31%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	4.0	37	1.489	0.214	125.8	55.2049	0.0000	OK
60 minute summer	4.1	35	1.342	0.315	160.1	4.7108	0.0000	OK
7200 minute winter	HW4.0	5400	1.325	0.575	28.3	0.0046	0.0000	OK
7200 minute winter	4.2	5400	1.320	0.458	8.5	1.1667	0.0000	OK
60 minute summer	4.3	33	1.508	0.108	31.1	0.6694	0.0000	OK
60 minute summer	4.4	33	1.472	0.122	25.3	0.7025	0.0000	OK
60 minute summer	4.5	33	1.338	0.173	50.3	0.9137	0.0000	OK
7200 minute winter	4.6	5460	1.320	0.273	2.6	0.4818	0.0000	OK
7200 minute winter	4.7	5460	1.319	0.459	4.1	0.8118	0.0000	OK
7200 minute winter	HW4.2	5520	1.325	0.575	6.5	0.1628	0.0000	OK
7200 minute winter	OUTFALL HW	5580	1.316	0.666	20.0	2.3087	0.0000	SURCHARGED
7200 minute winter	OUTFALL	5580	1.316	0.738	1.9	1.8792	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	4.0	4.000	4.1	74.7	0.962	0.345	7.5347	
60 minute summer	4.1	4.001	4.2	155.5	0.970	0.518	13.8003	
7200 minute winter	HW4.0	Flow through pond	OUTFALL HW	20.0	0.007	0.000	1082.4966	
7200 minute winter	4.2	4.002	HW4.0	12.9	0.438	0.043	4.9096	
60 minute summer	4.3	4.008	4.2	31.0	1.211	0.174	1.0992	
60 minute summer	4.4	4.003	4.5	24.9	0.787	0.155	1.3998	
60 minute summer	4.5	4.004	4.6	49.9	0.824	0.227	3.4507	
7200 minute winter	4.6	4.005	4.7	4.1	0.263	0.019	14.0975	
7200 minute winter	4.7	4.006	HW4.2	6.5	0.319	0.030	3.6587	
7200 minute winter	HW4.2	Flow through pond	OUTFALL HW	20.0	0.007	0.000	1082.4966	
7200 minute winter	OUTFALL HW	4.007	OUTFALL	1.9	0.048	0.027	1.2216	
7200 minute winter	OUTFALL	Pump		1.9				519.2

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Results for 30 year Critical Storm Duration. Lowest mass balance: 95.31%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	4.0	2880	1.788	0.513	15.9	155.1912	0.0000	OK
2880 minute winter	4.1	2880	1.789	0.762	43.9	11.3924	0.0000	SURCHARGED
4320 minute winter	HW4.0	4140	1.825	1.075	74.1	0.0086	0.0000	OK
4320 minute winter	4.2	4260	1.794	0.932	42.3	2.3732	0.0000	SURCHARGED
4320 minute winter	4.3	4200	1.791	0.391	8.5	2.4217	0.0000	SURCHARGED
4320 minute winter	4.4	4140	1.775	0.425	4.8	2.4375	0.0000	OK
4320 minute winter	4.5	4140	1.775	0.610	6.5	3.2147	0.0000	SURCHARGED
4320 minute winter	4.6	4140	1.775	0.728	7.9	1.2864	0.0000	SURCHARGED
4320 minute winter	4.7	4140	1.774	0.914	9.7	1.6146	0.0000	SURCHARGED
4320 minute winter	HW4.2	4140	1.795	1.045	44.6	0.2957	0.0000	OK
4320 minute winter	OUTFALL HW	4140	1.756	1.106	72.0	3.8295	0.0000	SURCHARGED
4320 minute winter	OUTFALL	4140	1.755	1.177	3.2	2.9953	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)
2880 minute winter	4.0	4.000	4.1	40.7	0.602	0.188	18.4826	
2880 minute winter	4.1	4.001	4.2	46.0	0.486	0.153	24.1564	
4320 minute winter	HW4.0	Flow through pond	OUTFALL HW	-77.9	0.015	-0.001	1993.8868	
4320 minute winter	4.2	4.002	HW4.0	59.6	0.480	0.199	5.7369	
4320 minute winter	4.3	4.008	4.2	6.6	0.535	0.037	4.3340	
4320 minute winter	4.4	4.003	4.5	-3.7	0.390	-0.023	6.9021	
4320 minute winter	4.5	4.004	4.6	7.9	0.375	0.036	12.1981	
4320 minute winter	4.6	4.005	4.7	8.0	0.283	0.036	19.4112	
4320 minute winter	4.7	4.006	HW4.2	-9.7	0.319	-0.044	3.8270	
4320 minute winter	HW4.2	Flow through pond	OUTFALL HW	-77.9	0.015	-0.001	1993.8868	
4320 minute winter	OUTFALL HW	4.007	OUTFALL	3.2	0.081	0.044	1.2216	
4320 minute winter	OUTFALL	Pump		3.0				495.8

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 95.31%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	4.0	44	2.379	1.104	495.5	454.1035	0.0000	SURCHARGED
4320 minute winter	4.1	4200	2.370	1.343	49.1	20.0850	0.0000	SURCHARGED
4320 minute winter	HW4.0	4260	2.407	1.657	82.8	0.0133	0.0000	OK
4320 minute winter	4.2	4200	2.369	1.507	51.7	3.8351	0.0000	SURCHARGED
4320 minute winter	4.3	4200	2.375	0.975	8.6	6.0353	0.0000	SURCHARGED
4320 minute winter	4.4	4260	2.358	1.008	3.7	5.7861	0.0000	SURCHARGED
4320 minute winter	4.5	4260	2.358	1.193	14.2	6.2913	0.0000	SURCHARGED
4320 minute winter	4.6	4260	2.359	1.312	14.4	2.3175	0.0000	SURCHARGED
4320 minute winter	4.7	4140	2.367	1.507	14.4	2.6634	0.0000	SURCHARGED
4320 minute winter	HW4.2	4260	2.376	1.626	52.6	0.4603	0.0000	OK
4320 minute winter	OUTFALL HW	4260	2.338	1.688	74.1	5.8478	0.0000	SURCHARGED
4320 minute winter	OUTFALL	4260	2.338	1.760	5.2	4.4786	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 winter	4.0	4.000	4.1	256.8	1.189	1.187	18.5386	
4320 minute winter	4.1	4.001	4.2	49.1	0.425	0.164	24.1564	
4320 minute winter	HW4.0	Flow through pond	OUTFALL HW	74.1	0.016	0.001	3382.9285	
4320 minute winter	4.2	4.002	HW4.0	56.8	0.494	0.189	5.7369	
4320 minute winter	4.3	4.008	4.2	10.8	0.551	0.061	4.3340	
4320 minute winter	4.4	4.003	4.5	10.6	0.409	0.066	6.9774	
4320 minute winter	4.5	4.004	4.6	14.4	0.367	0.065	12.1981	
4320 minute winter	4.6	4.005	4.7	14.4	0.291	0.065	19.4112	
4320 minute winter	4.7	4.006	HW4.2	17.1	0.321	0.078	3.8270	
4320 minute winter	HW4.2	Flow through pond	OUTFALL HW	74.1	0.016	0.001	3382.9285	
4320 minute winter	OUTFALL HW	4.007	OUTFALL	5.2	0.074	0.073	1.2216	
4320 minute winter	OUTFALL	Pump		4.5				734.4

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	Minimum Backdrop Height (m)	9.000
Ratio-R	0.400	Preferred Cover Depth (m)	0.900
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

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)
4.000	4.0	4.1	85.814	0.600	1.275	1.102	0.173	495.0	525	6.43	46.4
4.001	4.1	4.2	85.759	0.600	1.027	0.862	0.165	520.0	600	7.78	42.1
4.002	4.2	HW4.0	20.367	0.600	0.862	0.823	0.039	520.0	600	8.10	41.3
4.003	4.4	4.5	44.037	0.600	1.350	1.240	0.110	400.0	450	5.73	49.0
4.004	4.5	4.6	56.464	0.600	1.165	1.047	0.118	480.0	525	6.65	45.6
4.005	4.6	4.7	89.853	0.600	1.047	0.860	0.187	480.0	525	8.13	41.2
4.006	4.7	HW4.2	17.715	0.600	0.860	0.823	0.037	480.0	525	8.42	40.4
4.007	OUTFALL HW	OUTFALL	17.348	0.600	0.650	0.578	0.072	240.0	300	5.29	50.0
4.008	4.3	4.2	39.294	0.600	1.400	1.087	0.313	125.5	375	5.41	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)
4.000	1.000	216.4	167.4	0.900	1.073	1.332	0.0
4.001	1.061	299.9	270.8	1.073	1.238	2.370	0.0
4.002	1.061	299.9	301.9	1.238	1.277	2.699	0.0
4.003	1.010	160.7	35.6	0.900	1.010	0.268	0.0
4.004	1.015	219.8	66.4	1.010	1.128	0.537	0.0
4.005	1.015	219.8	60.0	1.128	1.315	0.537	0.0
4.006	1.015	219.8	58.9	1.315	1.352	0.537	0.0
4.007	1.010	71.4	0.0	1.750	1.822	0.000	0.0
4.008	1.615	178.4	44.6	0.925	1.238	0.329	0.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	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 %)
2	0	0	0	100	30	0	0
30	0	0	0				

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Node OUTFALL Online Pump Control

Flap Valve	x	Design Depth (m)	1.770	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	4.5		
Invert Level (m)	0.578	Switch on depth (m)	0.150		

Depth (m)	Flow (l/s)
1.770	4.500

Node OUTFALL HW Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	60.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.650	Main Channel Slope (1:X)	600.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.033

Inlets

HW4.0

Depth (m)	Area (m²)	Inf Area (m²)
0.000	1566.0	0.0

HW4.2

Depth (m)	Area (m²)	Inf Area (m²)
2.000	2782.0	0.0

Node 4.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.275
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	13

Depth (m)	Area (m²)	Inf Area (m²)
0.000	205.0	0.0

Depth (m)	Area (m²)	Inf Area (m²)
1.425	628.0	0.0

Node 4.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)
0.000	84.0	0.0

Depth (m)	Area (m²)	Inf Area (m²)
0.450	582.0	0.0

Depth (m)	Area (m²)	Inf Area (m²)
0.451	0.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 92.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	4.0	22	1.528	0.253	176.0	66.7045	0.0000	OK
15 minute winter	4.1	12	1.437	0.410	239.2	6.1265	0.0000	OK
15 minute winter	HW4.0	12	1.242	0.492	261.1	0.0039	0.0000	OK
15 minute winter	4.2	12	1.323	0.461	268.8	1.1722	0.0000	OK
15 minute winter	4.3	10	1.549	0.149	56.8	0.9247	0.0000	OK
15 minute winter	4.4	10	1.518	0.168	46.3	0.9663	0.0000	OK
15 minute winter	4.5	11	1.405	0.240	91.5	1.2665	0.0000	OK
15 minute winter	4.6	12	1.282	0.235	90.3	0.4148	0.0000	OK
1440 minute winter	4.7	1440	1.199	0.339	4.7	0.5993	0.0000	OK
1440 minute winter	HW4.2	1440	1.203	0.453	15.8	0.1282	0.0000	OK
1440 minute winter	OUTFALL HW	1440	1.197	0.547	18.8	1.8942	0.0000	SURCHARGED
1440 minute winter	OUTFALL	1440	1.197	0.619	1.6	1.5747	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	4.0	4.000	4.1	99.4	1.011	0.459	10.0712	
15 minute winter	4.1	4.001	4.2	219.6	1.019	0.732	18.7472	
15 minute winter	HW4.0	Flow through pond	OUTFALL HW	374.1	0.211	0.005	244.2923	
15 minute winter	4.2	4.002	HW4.0	261.1	1.180	0.871	4.5046	
15 minute winter	4.3	4.008	4.2	56.1	1.348	0.315	2.0928	
15 minute winter	4.4	4.003	4.5	45.0	0.854	0.280	2.3338	
15 minute winter	4.5	4.004	4.6	90.3	0.975	0.411	5.3162	
15 minute winter	4.6	4.005	4.7	88.5	0.975	0.403	8.1787	
1440 minute winter	4.7	4.006	HW4.2	5.6	0.435	0.026	2.7882	
1440 minute winter	HW4.2	Flow through pond	OUTFALL HW	18.8	0.021	0.000	854.4963	
1440 minute winter	OUTFALL HW	4.007	OUTFALL	1.6	0.124	0.022	1.2216	
1440 minute winter	OUTFALL	Pump		1.6				97.8

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Results for 30 year Critical Storm Duration. Lowest mass balance: 92.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	4.0	14	1.789	0.514	498.9	155.5341	0.0000	OK
30 minute summer	4.1	18	1.712	0.685	364.2	10.2453	0.0000	SURCHARGED
1440 minute winter	HW4.0	1260	1.506	0.756	93.5	0.0061	0.0000	OK
15 minute winter	4.2	11	1.547	0.685	381.7	1.7423	0.0000	SURCHARGED
15 minute winter	4.3	11	1.635	0.235	107.6	1.4574	0.0000	OK
15 minute winter	4.4	10	1.598	0.248	87.7	1.4220	0.0000	OK
15 minute winter	4.5	11	1.523	0.358	172.6	1.8882	0.0000	OK
1440 minute winter	4.6	1410	1.469	0.422	8.2	0.7454	0.0000	OK
1440 minute winter	4.7	1410	1.470	0.610	7.7	1.0784	0.0000	SURCHARGED
720 minute winter	HW4.2	930	1.519	0.769	69.4	0.2177	0.0000	OK
1440 minute winter	OUTFALL HW	1440	1.466	0.816	57.1	2.8260	0.0000	SURCHARGED
1440 minute winter	OUTFALL	1440	1.466	0.888	2.5	2.2593	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	4.0	4.000	4.1	220.9	1.222	1.021	18.4882	
30 minute summer	4.1	4.001	4.2	298.1	1.093	0.994	24.1564	
1440 minute winter	HW4.0	Flow through pond	OUTFALL HW	57.1	0.035	0.001	1379.0292	
15 minute winter	4.2	4.002	HW4.0	372.7	1.323	1.243	5.7369	
15 minute winter	4.3	4.008	4.2	101.7	1.432	0.570	3.5975	
15 minute winter	4.4	4.003	4.5	84.7	0.899	0.527	4.2803	
15 minute winter	4.5	4.004	4.6	168.4	1.117	0.766	8.6472	
1440 minute winter	4.6	4.005	4.7	7.7	0.421	0.035	18.0611	
1440 minute winter	4.7	4.006	HW4.2	9.2	0.433	0.042	3.8270	
720 minute winter	HW4.2	Flow through pond	OUTFALL HW	41.3	0.048	0.001	1274.0900	
1440 minute winter	OUTFALL HW	4.007	OUTFALL	2.5	0.063	0.035	1.2216	
1440 minute winter	OUTFALL	Pump		2.3				143.2

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 92.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	4.0	24	2.235	0.960	682.7	361.2155	0.0000	SURCHARGED
15 minute winter	4.1	11	2.137	1.110	571.5	16.5940	0.0000	SURCHARGED
1440 minute winter	HW4.0	1440	1.964	1.214	64.0	0.0097	0.0000	OK
1440 minute winter	4.2	1380	1.926	1.064	65.5	2.7075	0.0000	SURCHARGED
15 minute winter	4.3	11	2.265	0.865	181.1	5.3577	0.0000	SURCHARGED
1440 minute winter	4.4	1440	1.896	0.546	6.8	3.1352	0.0000	SURCHARGED
1440 minute winter	4.5	1440	1.897	0.732	15.9	3.8580	0.0000	SURCHARGED
1440 minute winter	4.6	1440	1.897	0.850	20.7	1.5017	0.0000	SURCHARGED
1440 minute winter	4.7	1440	1.900	1.040	19.8	1.8376	0.0000	SURCHARGED
1440 minute winter	HW4.2	1350	1.922	1.172	56.3	0.3317	0.0000	OK
1440 minute winter	OUTFALL HW	1440	1.895	1.245	64.1	4.3112	0.0000	SURCHARGED
1440 minute winter	OUTFALL	1440	1.894	1.316	3.7	3.3497	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	4.0	4.000	4.1	288.0	1.333	1.331	18.5386	
15 minute winter	4.1	4.001	4.2	366.2	1.300	1.221	24.1564	
1440 minute winter	HW4.0	Flow through pond	OUTFALL HW	64.1	0.034	0.001	2306.1392	
1440 minute winter	4.2	4.002	HW4.0	64.0	0.683	0.213	5.7369	
15 minute winter	4.3	4.008	4.2	168.4	1.527	0.944	4.3340	
1440 minute winter	4.4	4.003	4.5	9.8	0.531	0.061	6.9774	
1440 minute winter	4.5	4.004	4.6	20.7	0.511	0.094	12.1981	
1440 minute winter	4.6	4.005	4.7	19.8	0.405	0.090	19.4112	
1440 minute winter	4.7	4.006	HW4.2	24.9	0.421	0.113	3.8270	
1440 minute winter	HW4.2	Flow through pond	OUTFALL HW	64.1	0.034	0.001	2306.1392	
1440 minute winter	OUTFALL HW	4.007	OUTFALL	3.7	0.155	0.052	1.2216	
1440 minute winter	OUTFALL	Pump		3.3				208.9

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