



Comhairle Contae Mhaigh Eo
Mayo County Council

Proposed Housing at Ballvary, Co. Mayo

Civils Design Report

6786-JOD-XX-XX-RP-C-001-P01

May 2022



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DOCUMENT APPROVAL

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CLIENT / JOB NO	Mayo County Council	6786
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Prepared by

Reviewed

Issue / Revision D02	Name Adam Parkes	Name Mark Forbes
Date May 2022	Signature 	Signature 

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1 INTRODUCTION

This report has been prepared to detail the Civil Works element of the proposed Housing Development at Ballyvary, Co. Mayo. It should be read in conjunction with the foul and storm drainage design drawings (refer to **Appendix A** for drawings) as outlined and noted herein.

This report details the foul and storm drainage design and watermain details for said development. The proposed housing development will entail the construction of a housing development consisting of semi-detached dwellings as well as Apartments and Bungalows with a total combined gross floor area of approximately 844m².

The proposed site, which consists of approximately 0.99 hectares, is a greenfield site located in Ballyvary, a small village situated on the N5 road between Swinford and Castlebar, approximately 10km south-west of Castlebar. It is proposed to access the site directly from the L1706 Road at the western boundary of the site.

It is proposed to direct the foul sewer from the development to the existing foul sewer network located in the L1706 Road at the western boundary of the site. This existing network serves the Ballyvary area. The proposed foul sewer will discharge under gravity to the existing foul network, where it then discharges to Bellavary WWTP.

It is proposed to discharge the storm water generated from the development into the adjacent existing land drain located along the northern boundary of the site. The existing land drain currently discharges into Mill Pond located past the south-eastern boundary of the site. The storm water generated from the development will discharge under gravity passing through a bypass separator before entering the proposed attenuation tank. Flow control measures will then be used to maintain greenfield run off flow rates and prevent capacity issues from occurring when discharging into the existing land drain.

2 FOUL WATER DRAINAGE DESIGN

2.1 Introduction

The drainage systems including all pipe sizes and gradients have been designed using Flow Drainage Design Software. The details of the Flow Outputs for the pipe designs are outlined in **Appendix B** of this report. The pipework to the drainage system has been designed to provide for six times the dry weather flow (DWF) in accordance with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). It is proposed that all pipes will be HDPE twinwall. The maximum pipe diameter is to be 150mm, with a maximum and minimum gradient such that all velocities fall within the limits of 0.75 and 2.5m/sec as set out in the “Code of Practice for Wastewater Infrastructure” by Irish Water.

As noted, the foul drainage for the entire development will be collected throughout the site in the foul pipe network and will then discharge by gravity to the existing foul network located in L1706 Road at the western boundary of the site. All of the pipe sizes and gradients are clearly indicated on the associated drawing. The typical specification of the proposed pipes are detailed in **Appendix C**. Details of the development's foul drainage network are shown on drawing 6786-JOD-XX-DR-C-700-001, included in **Appendix A**.

2.2 Occupancy Figures & Wastewater Flow Rates

The wastewater flow rate of the proposed development is calculated as follows in accordance with the recommendations from the Irish Water Code of Practice for Wastewater Infrastructure. Therefore, a wastewater flow rate of 150 litres/person/day was assumed. A detailed breakdown of the Hydraulic loadings is outlined as follows:

Source		Hydraulic Loading (Litres/Day)		
Description	Total Units	Occupancy Per Unit	Total (Litres/Day)	Total 6 DWF (Litres/Day)
3 Bed Semi-Detached Dwelling	4	4	2,400	14,400
2 Bed Bungalow Dwelling	6	3	2,700	16,200
1 Bed Apartment Dwelling	2	2	600	3,600
Total	12		5,700	34,200

The total hydraulic load for the proposed development is 5,700 Litres per day with a 6DWF of 34,200 Litres per day. We note that the proposed development will create an additional average daily amount of 0.066 litres / second on the existing public foul system. The proposed foul network was sized to accommodate 6 times the dry weather flow, 0.396 litres / second.

3 STORM WATER DRAINAGE DESIGN

3.1 Introduction

The storm water drainage system has been designed to cater for the developments hardstanding areas (including roofs, footways, roadways and car parking). The proposed storm network will discharge surface water run-off into the adjacent existing land drain located along the northern boundary of the site. The proposed attenuation tank is located to the north of the proposed site within the grass field area. It is proposed that all storm water generated by the site will gravity flow to the proposed attenuation tank via a Class 1 Klargestor NSBE010 Bypass separator or similar. Details of the development's storm drainage network are shown on drawing 6786-JOD-XX-DR-C-700-001, included in **Appendix A**.

The storm drainage for the entire development has been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS). The details of the pipe designs and are outlined in **Appendix B** of this report. The storm water drainage design has been designed to cater for surface water from hard surfaces in the proposed development including roadways, footpaths, and the proposed buildings.

The following parameters form the basis of the design:

- The surface water run-off is calculated using the Modified Rational Method (Wallingford Procedure)

$$Q = 2.78 \times C_v \times C_r \times I \times A$$

Where,	Q	=	rate of run-off, l/s
	C _v	=	Volumetric Run-off Coefficient
	C _r	=	Routing Coefficient
	I	=	Intensity of Rainfall, mm/hr
	A	=	Impermeable Area, hectares

- A design return period of 100 years + 20% allowance for climate change has been adopted for the storm network in accordance with good design practice.
- The rainfall intensity is based on rainfall data for Ballyvary Village
- Minimum self-cleansing velocity of 0.75 m/s
- Q-bar discharge rate shall be equal to the greenfield runoff rate
- The Principles of SuDS to be adopted for the surface water drainage

The following impermeability factors were adopted in accordance with good design practice:

- Macadam Roadways = 0.45
- Roof Areas = 0.85
- Concrete Areas = 0.85

3.1.1 Site Drainage

Storm water run-off from the internal roads, parking bays and footpaths will be collected by precast concrete gullies including lockable cast iron grating and frames connected to a piped system. Surface water run-off from roof areas will be collected via downpipe connections to the main network.

Gullies are located as shown on drawing number 6786-JOD-XX-ZZ-DR-C-700-001. Gullies are positioned in accordance with the 'Recommendations for Site Development Works'. Gullies are provided at a minimum rate of one gully per 200m².

The total storm water run-off calculated is based on the impermeable area of the site:

Total Impermeable Area	=	3,280	m ²
Total Greenfield Run-off for the site	=	4.7	L/s

3.2 Proposed Attenuation

It is proposed to install an attenuation tank after storm manhole S7 as per drawing number 6786-JOD-XX-ZZ-DR-C-700-001. The proposed attenuation tank dimensions of 8.8m wide X 8.8m long X 1.05m high are based on a GRAF EcoBloc maxx system comprising of 363 No. EcoBloc maxx units. Alternative products can be submitted for approval prior to construction commencing.

A Hydro-Brake flow control device with a design depth of 0.5m and a design flow of 4.7 l/s is proposed to be installed at the outlet of the attenuation tank. Alternative products can be submitted for approval prior to construction commencing.

The exact size and dimensions of the attenuation tank have been chosen in combination with the proposed Hydro-Brake to limit the discharge rate to an acceptable level and minimise the risk of flooding for all modelled flood events.

A class 1 petrol interceptor capable of a peak flowrate of 100 l/s is required to be installed upstream of the attenuation tank as per drawing 6786-JOD-XX-ZZ-DR-C-700-001. A Klargestor Bypass Separator NSEB010 or similar approved is proposed.

3.3 SuDS Principles

The key SuDS principles that influence the planning and design process, enabling SuDS to mimic natural drainage are:

- Storing runoff and releasing it slowly (attenuation)
- Harvesting and using the rain close to where it falls

- Allowing water to soak into the ground (infiltration)
- Slowly transporting (conveying) water on the surface
- Filtering out pollutants
- Allowing sediments to settle out by controlling the flow of the water

The proposed drainage scheme takes into account a number of the above listed principles through the following measures:

- The proposed attenuation tank stores runoff and releases it slowly into the adjacent existing storm drain.
- Providing public open space green areas allowing rainfall to naturally percolate into the ground
- Strategic placing of gullies to keep road surface gradients as gentle as possible to cater for the slow transporting of water on the surface
- Proposing a class 1 petrol/oil interceptor to remove pollutants from the system

4 WATER MAIN

The water main has been designed in accordance with the Code of Practice for Water Infrastructure. A 110mm OD PE connection is proposed to be made to the existing water main located in L1706 Road at the western boundary of the site as shown on drawing 6786-JOD-XX-ZZ-DR-C-700-006, included in **Appendix A**. A 50mm PE connection will be made to each dwelling/unit.

Hydrants will be positioned within the site such that:

- The distance from each building is not less than 6m or more than 46m,
- The distance from a hydrant to a vehicle access road or hard-standing area for fire appliances is not more than 30m,
- They are distributed around the perimeter of the buildings, having regard for the provision of access for fire appliances,

(as per Building Regulations 2006 Technical Guidance Document B)

The hydrants shall be capable of delivering a minimum of 35 litres per second through any single hydrant as per Water UK – National Guidance Document on the Provision of Water for Fire Fighting.

In accordance with Irish Water standards a Water meter, Logging Device (Larson Type) and sluice valves are proposed at the connection into the proposed site. All water mains are to be commissioned and pressure tested to Irish Water Standards. The typical connection details and meter details are shown in revision 4 of Irish Water standard details.

5 CONCLUSION

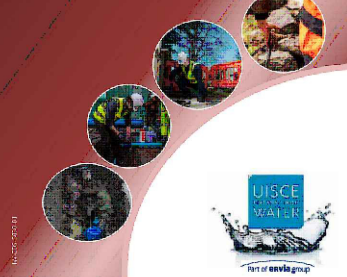
The report should be read in conjunction with the associated drawings, layouts and specifications. The wastewater drainage layout, storm water drainage layout and watermain layout meet the requirements of the proposed development and are in accordance with the relevant codes of practice and standards.

APPENDIX A

DRAWINGS

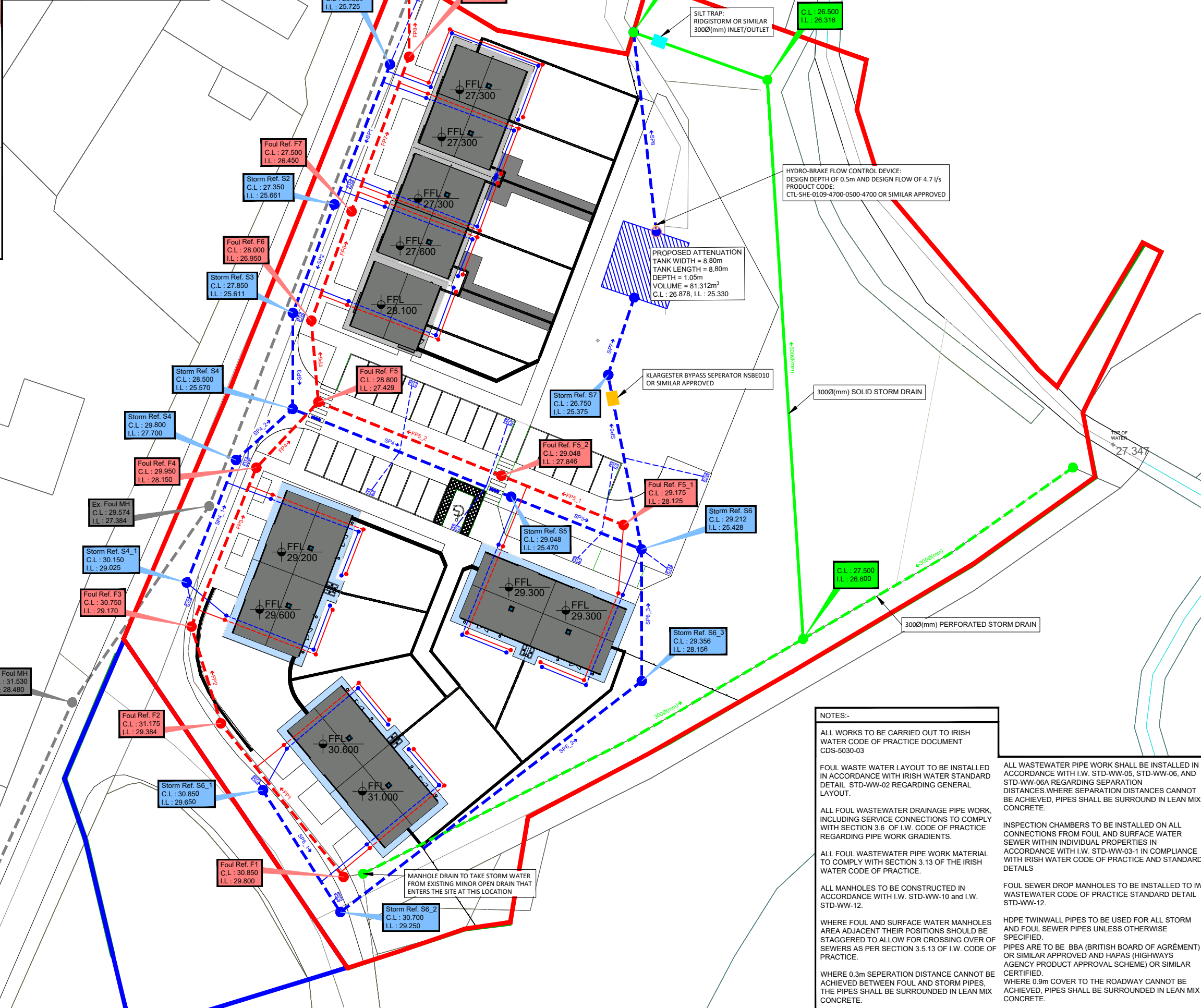
Wastewater Infrastructure Standard Details

Connections and Developer Services
 Design and Construction Requirements, For Self Lay Developments
 July 2020 (Revision 4)
 www.wat.ie



NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WASTEWATER INFRASTRUCTURE DETAILS. THIS BOOKLET HAS BEEN INCLUDED IN PART OF THE CIVIL/STRUCTURAL PACKAGE.

STORM PIPE SCHEDULE				FOUL PIPE SCHEDULE			
PIPE REFERENCE	SIZE Ø (mm)	SLOPE	LENGTH (m)	PIPE REFERENCE	SIZE Ø (mm)	SLOPE	LENGTH (m)
SP1	225	1:298.5	19.107	FP1	150	1:59.9	24.931
SP2	225	1:294.9	14.745	FP2	150	1:60	12.831
SP3	225	1:296.6	12.161	FP3	150	1:59.9	21.750
SP4_1	225	1:47.9	16.760	FP4	150	1:15.9	11.468
SP4_2	225	1:29.8	9.890	FP5_1	150	1:59.9	16.705
SP4	225	1:298.6	29.857	FP5_2	150	1:60	25.016
SP5	300	1:424.6	17.832	FP5	150	1:21.6	10.357
SP6_1	300	1:45.8	18.316	FP6	150	1:29.5	14.760
SP6_2	300	1:44	48.169	FP7	150	1:41.9	20.929
SP6_3	300	1:116	16.708	FP8	150	1:59.9	7.864
SP6	300	1:425	22.523				
SP7	300	1:425.2	19.136				
SP8	300	1:431.8	25.476				



NOTES

GENERAL NOTES:

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- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS. CONTRACTOR TO VERIFY THE ACCURACY OF THIS PROPOSAL, TO THE ENGINEER AND ALLOW FOR MINOR CORRECTIONS AS DEEMED NECESSARY WITH A REASONABLE TIMEFRAME.

LEGEND

- SITE BOUNDARY shown thus: [Red solid line]
- PROPOSED STORM MANHOLE shown thus: [Blue dot]
- PROPOSED STORM WATER NETWORK shown thus: [Blue dashed line]
- PROPOSED FOUL MANHOLE shown thus: [Red dot]
- PROPOSED FOUL NETWORK shown thus: [Red dashed line]
- PROPOSED SURFACE WATER CONNECTIONS shown thus: [Blue solid line]
- PROPOSED FOUL WATER CONNECTIONS shown thus: [Red solid line]
- PROPOSED ROAD GULLIES shown thus: [Blue square with 'G']
- EXISTING FOUL MANHOLE shown thus: [Black dot]
- EXISTING FOUL NETWORK shown thus: [Black dashed line]
- 300mm PROPOSED PERFORATED STORM DRAIN shown thus: [Green dashed line]
- 300mm PROPOSED SOLID STORM DRAIN shown thus: [Green solid line]

Site Area:-
 9,900 m², 2.44 Acres, 0.99 Hectares
 ITM Co-Ordinates of site:-
 524360, 794418
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 OS Sheet No. 1908

D.02	Issued for Discussion	AP	MF	26.05.22
D.01	Issued for Discussion	AP	MF	20.05.22
rev.	modifications	by	chkd	date
Layout Ref.:				
file	P:\Jod-jobs\6786 Ballyvary Housing\700 Drawings\703 Planning\01 WIP\6786-JOD-XX-ZZ-DR-C-700-001-003 Foul & Storm Site Layout Plan.dwg			

client

 Comhairle Contae Mhaigh Eo
 Mayo County Council

project
 PROPOSED HOUSING AT BALLYVARY,
 CO. MAYO.

stage
 DRAFT

title
 FOUL & STORM SITE LAYOUT PLAN

scale
 1:250 @ A1

surveyed	drawn	checked	date
JOD	AP	MF	May 2022

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drawing no. **6786-JOD-XX-ZZ-DR-C-700-001** revision **D.02**

NOTES:-

ALL WORKS TO BE CARRIED OUT TO IRISH WATER CODE OF PRACTICE DOCUMENT CDS-5030-03

FOUL WASTE WATER LAYOUT TO BE INSTALLED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-WW-02 REGARDING GENERAL LAYOUT.

ALL FOUL WASTE WATER DRAINAGE PIPE WORK, INCLUDING SERVICE CONNECTIONS TO COMPLY WITH SECTION 3.6 OF I.W. CODE OF PRACTICE REGARDING PIPE WORK GRADIENTS.

ALL FOUL WASTE WATER PIPE WORK MATERIAL TO COMPLY WITH SECTION 3.13 OF THE IRISH WATER CODE OF PRACTICE.

ALL MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH I.W. STD-WW-10 and I.W. STD-WW-12.

WHERE FOUL AND SURFACE WATER MANHOLES ADJACENT THEIR POSITIONS SHOULD BE STAGGERED TO ALLOW FOR CROSSING OVER OF SEWERS AS PER SECTION 3.5.13 OF I.W. CODE OF PRACTICE.

WHERE 0.3m SEPERATION DISTANCE CANNOT BE ACHIEVED BETWEEN FOUL AND STORM PIPES, THE PIPES SHALL BE SURROUNDED IN LEAN MIX CONCRETE.

ALL WASTEWATER PIPE WORK SHALL BE INSTALLED IN ACCORDANCE WITH I.W. STD-WW-05, STD-WW-06, AND STD-WW-06A REGARDING SEPARATION DISTANCES WHERE SEPARATION DISTANCES CANNOT BE ACHIEVED, PIPES SHALL BE SURROUND IN LEAN MIX CONCRETE.

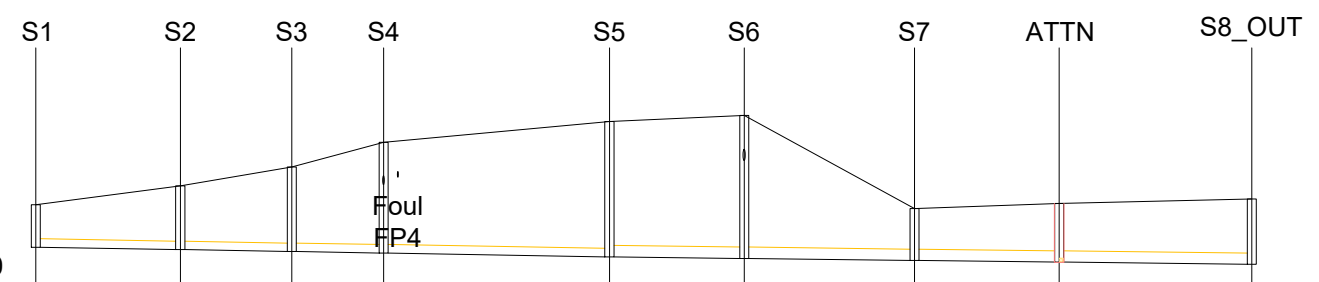
INSPECTION CHAMBERS TO BE INSTALLED ON ALL CONNECTIONS FROM FOUL AND SURFACE WATER SEWER WITHIN INDIVIDUAL PROPERTIES IN ACCORDANCE WITH I.W. STD-WW-03-1 IN COMPLIANCE WITH IRISH WATER CODE OF PRACTICE AND STANDARD DETAILS

FOUL SEWER DROP MANHOLES TO BE INSTALLED TO IW WASTEWATER CODE OF PRACTICE STANDARD DETAIL STD-WW-12.

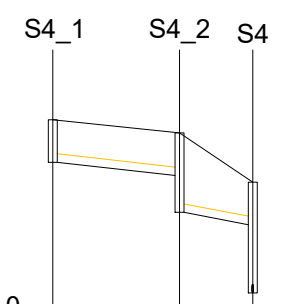
HDPE TWINWALL PIPES TO BE USED FOR ALL STORM AND FOUL SEWER PIPES UNLESS OTHERWISE SPECIFIED.

PIPES ARE TO BE BBA (BRITISH BOARD OF AGREMENT) OR SIMILAR APPROVED AND HAPAS (HIGHWAYS AGENCY PRODUCT APPROVAL SCHEME) OR SIMILAR CERTIFIED.

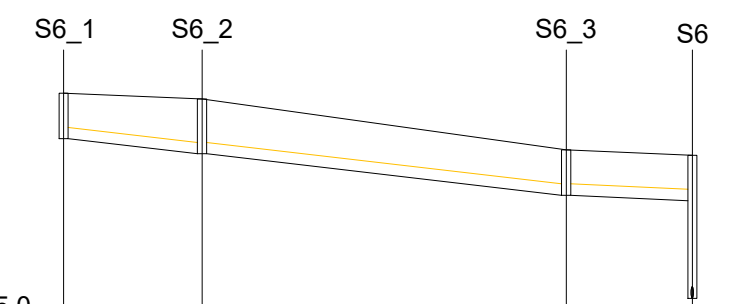
WHERE 0.9m COVER TO THE ROADWAY CANNOT BE ACHIEVED, PIPES SHALL BE SURROUNDED IN LEAN MIX CONCRETE.



Link Name	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8
Section Type	225mm	225mm	225mm	225mm	300mm	300mm	300mm	300mm
Slope	1:298.5	1:294.9	1:296.6	1:298.6	1:424.6	1:425.0	1:425.2	1:431.8
Cover Level	26.850	27.350	27.850	28.500	29.048	29.212	26.750	26.878
Invert Level	25.725	25.661	25.611	25.570	25.470	25.428	25.375	25.330
Length	19.107	14.745	12.161	29.857	17.832	22.523	19.136	25.476



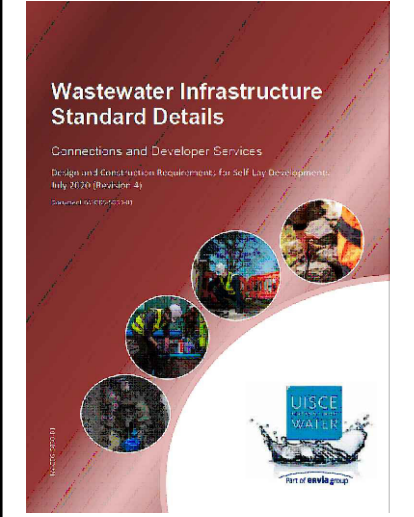
Link Name	SP4_1	SP4_2
Section Type	225mm	225mm
Slope	1:47.9	1:29.8
Cover Level	30.150	29.800
Invert Level	29.025	28.675
Length	16.760	9.690



Link Name	SP6_1	SP6_2	SP6_3
Section Type	300mm	300mm	300mm
Slope	1:45.8	1:44.0	1:116.0
Cover Level	30.850	30.700	29.356
Invert Level	29.650	29.250	28.156
Length	18.316	48.169	16.706

NOTES

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NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WASTEWATER INFRASTRUCTURE DETAILS.

rev.	modifications	by	chkd	date
D.02	Issued for Discussion	AP	MF	26.05.22
D.01	Issued for Discussion	AP	MF	20.05.22

client	MAYO CO.CO.		
project	PROPOSED HOUSING AT BALLYVARY, CO. MAYO.		
stage	DRAFT		
title	PROPOSED STORM SEWER SECTIONS		
scale	HORIZ: 1:1000, VERT: 1:200 @ A3		
surveyed	drawn	checked	date
	AP	MF	May 2022

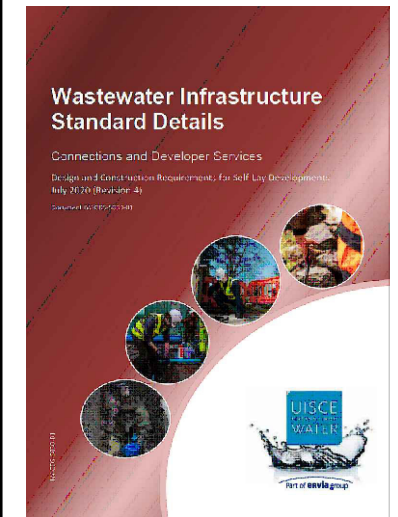
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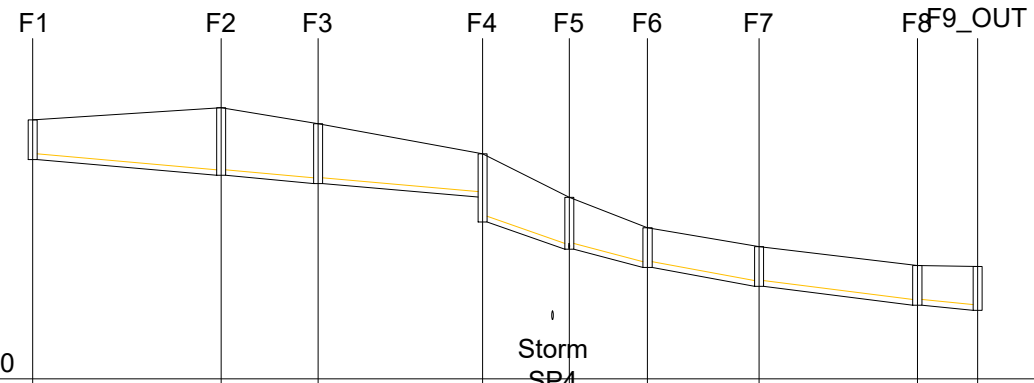
drawing no.	6786-JOD-XX-ZZ-DR-C-700-002	revision	D.02
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NOTES

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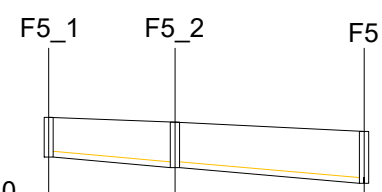


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Vert exaggeration = 5.0
Datum = 24.0

Link Name	FP1	FP2	FP3	FP4	FP5	FP6	FP7	FP8
Section Type	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm
Slope	1:59.9	1:60.0	1:59.9	1:15.9	1:21.6	1:29.5	1:41.9	1:59.9
Cover Level	30.850	31.175	30.750	29.950	28.800	28.000	27.500	27.000
Invert Level	29.800	29.384	29.170	28.807	27.429	26.950	26.450	25.950
Length	24.931	12.831	21.750	11.468	10.357	14.760	20.929	7.964



Vert exaggeration = 5.0
Datum = 26.0

Link Name	FP5_1	FP5_2
Section Type	150mm	150mm
Slope	1:59.9	1:60.0
Cover Level	29.175	29.048
Invert Level	28.125	27.846
Length	16.705	25.016

D.02	Issued for Discussion	AP	MF	26.05.22
D.01	Issued for Discussion	AP	MF	20.05.22
rev.	modifications	by	chkd	date
Layout Ref.:				
file	P:\jod-jobs\6786 Ballyvary Housing\700 Drawings\703 Planning\01 WIP\6786-JOD-XX-ZZ-DR-C-700-001-003 Foul & Storm Site Layout Plan.dwg			

client	MAYO CO.CO.		
project	PROPOSED HOUSING AT BALLYVARY, CO. MAYO.		
stage	DRAFT		
title	PROPOSED FOUL SEWER SECTIONS		
scale	HORIZ: 1:1000, VERT: 1:200 @ A3		
surveyed	drawn	checked	date
	AP	MF	May 2022

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drawing no.	6786-JOD-XX-ZZ-DR-C-700-003	revision	D.02
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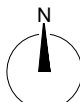
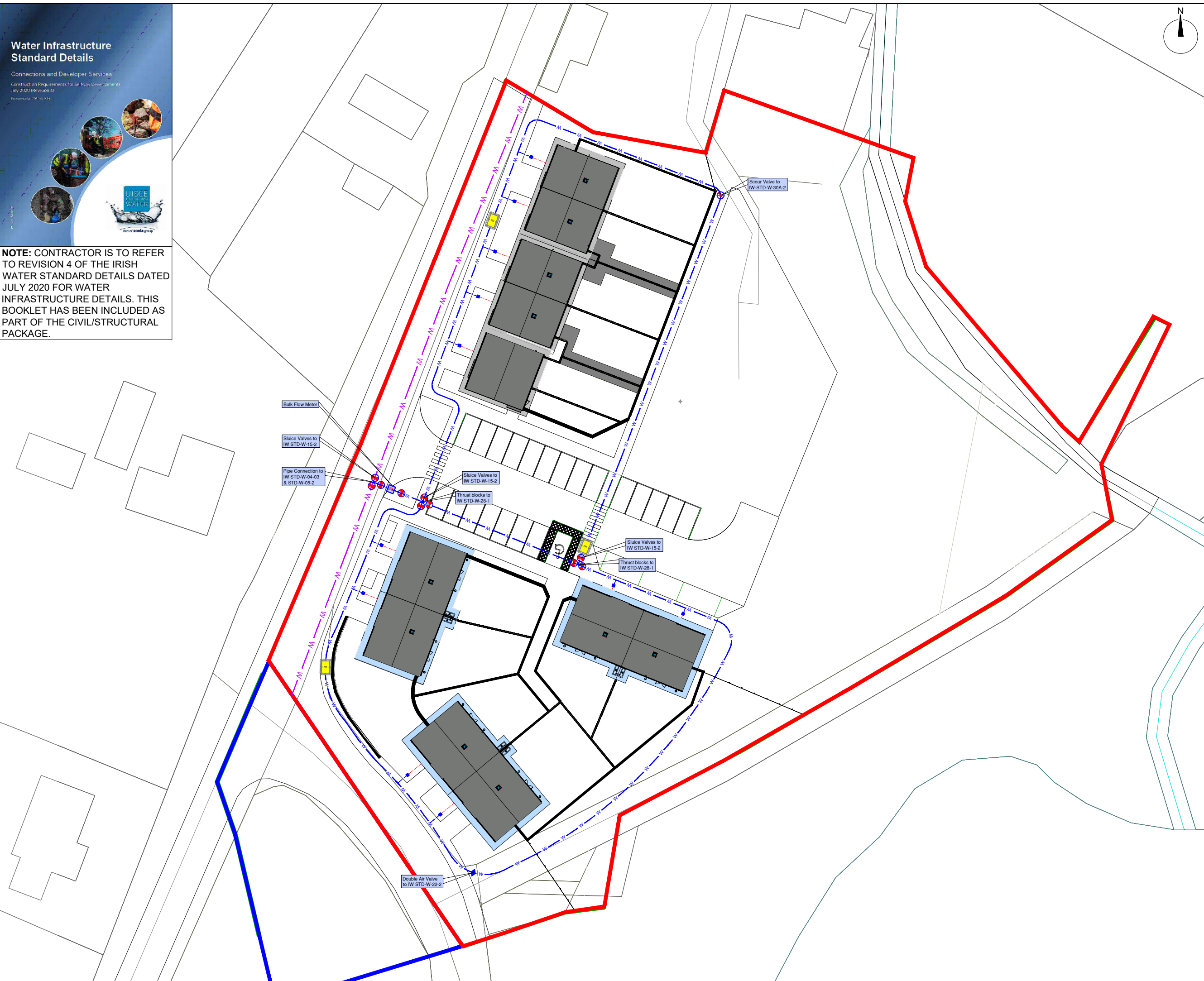
Water Infrastructure Standard Details

Connections and Developer Services

Construction Requirements for Self-Lay Developments
July 2020 (Revision 4)



NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WATER INFRASTRUCTURE DETAILS. THIS BOOKLET HAS BEEN INCLUDED AS PART OF THE CIVIL/STRUCTURAL PACKAGE.



NOTES

GENERAL NOTES:

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
- ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
- THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
- ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS. CONTRACTOR TO VERIFY THE ACCURACY OF THIS PROPOSAL TO THE ENGINEER AND ALLOW FOR MINOR CORRECTIONS AS DEEMED NECESSARY WITH A REASONABLE TIMEFRAME.

LEGEND

- SITE BOUNDARY shown thus
- WATERMAIN SUPPLY Ø 110mm OUTSIDE DIAMETER PE100 JDR1. PIPE MATERIAL SHALL BE IN COMPLIANCE WITH IRISH WATER SECTION 3.9 OF THE CODE OF PRACTICE.
- PROPOSED WATER SUPPLY CONNECTION WITH BOUNDARY BOX TO I.W. STD-W-03 shown thus
- FIRE HYDRANT TO I.W. STD-W-18/19 shown thus (3 No. Hyd)
- SLUICE VALVE TO I.W. STD-W-15-2 shown thus (10 No. SV's)
- SCOUR VALVE TO I.W. STD-W-30A-2 shown thus (1 No. SC.v's)
- BULK FLOW METER To Incl. Kiosk TO STD-W-36 AND METER CHAMBER TO STD-W-26 shown thus
- EXISTING WATERMAIN

Site Area:-
9,900 m², 2.44 Acres, 0.99 Hectares
ITM Co-Ordinates of site:-
524360, 794418

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OS Sheet No. 1908

D.01	Issued for Discussion	AP	MF	20.05.22
rev.	modifications	by	chkd	date
Layout Ref.:				
file	P:\Jod-jobs\6786 Ballyvary Housing\700 Drawings\703 Planning\01 WIP\6786-JOD-XX-ZZ-DR-C-700-007 Watermain Site Layout Plan.dwg			

client Comhairle Contae Mhaigh Eo
Mayo County Council

project
PROPOSED HOUSING AT BALLYVARY,
CO. MAYO.

stage
DRAFT

title
WATERMAIN SITE LAYOUT PLAN

scale
1:250 @ A1

surveyed	drawn	checked	date
JOD	AP	MF	May 2022

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drawing no.	revision
6786-JOD-XX-ZZ-DR-C-700-007	D.01

APPENDIX B
DESIGN CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Inverts
M5-60 (mm)	16.900	Minimum Backdrop Height (m)	0.600
Ratio-R	0.268	Preferred Cover Depth (m)	0.900
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Adoptable Manhole Type

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

>900 Link+900 mm

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

Circular Link Type

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

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.051	5.00	26.850	1200	524356.638	794466.312	1.125
S2	0.027	5.00	27.350	1200	524349.578	794448.557	1.689
S3			27.850	1200	524344.317	794434.782	2.239
S4_1	0.044	5.00	30.150	1200	524330.849	794400.588	1.125
S4_2	0.059	5.00	29.800	1200	524337.099	794416.139	2.100
S4			28.500	1200	524344.302	794422.621	2.930
S5	0.074	5.00	29.048	1200	524371.998	794411.470	3.578
S6_1	0.056	5.00	30.850	1200	524340.518	794374.264	1.200
S6_2			30.700	1200	524350.344	794358.807	1.450
S6_3			29.356	1200	524388.579	794388.104	1.200
S6	0.017	5.00	29.212	1200	524388.540	794404.810	3.784
S7			26.750	1200	524384.312	794426.933	1.375
ATTN			26.878	1200	524390.414	794445.070	1.548
S8_OUT			27.000	1200	524387.538	794470.383	1.729

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)
SP1	S1	S2	19.107	0.600	25.725	25.661	0.064	298.5	225	5.42	50.0
SP2	S2	S3	14.745	0.600	25.661	25.611	0.050	294.9	225	5.75	50.0
SP3	S3	S4	12.161	0.600	25.611	25.570	0.041	296.6	225	6.02	50.0
SP4_1	S4_1	S4_2	16.760	0.600	29.025	28.675	0.350	47.9	225	5.15	50.0
SP4_2	S4_2	S4	9.690	0.600	27.700	27.375	0.325	29.8	225	5.21	50.0
SP4	S4	S5	29.857	0.600	25.570	25.470	0.100	298.6	225	6.68	50.0
SP5	S5	S6	17.832	0.600	25.470	25.428	0.042	424.6	300	7.07	50.0
SP6_1	S6_1	S6_2	18.316	0.600	29.650	29.250	0.400	45.8	300	5.13	50.0
SP6_2	S6_2	S6_3	48.169	0.600	29.250	28.156	1.094	44.0	300	5.47	50.0
SP6_3	S6_3	S6	16.706	0.600	28.156	28.012	0.144	116.0	300	5.66	50.0
SP6	S6	S7	22.523	0.600	25.428	25.375	0.053	425.0	300	7.57	50.0
SP7	S7	ATTN	19.136	0.600	25.375	25.330	0.045	425.2	300	7.99	50.0
SP8	ATTN	S8_OUT	25.476	0.600	25.330	25.271	0.059	431.8	300	8.56	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)
SP1	0.751	29.9	6.9	0.900	1.464	0.051	0.0	73	0.613
SP2	0.756	30.1	10.6	1.464	2.014	0.078	0.0	92	0.690
SP3	0.754	30.0	10.6	2.014	2.705	0.078	0.0	92	0.688
SP4_1	1.895	75.3	6.0	0.900	0.900	0.044	0.0	43	1.141
SP4_2	2.405	95.6	14.0	1.875	0.900	0.103	0.0	58	1.724
SP4	0.751	29.9	24.5	2.705	3.353	0.181	0.0	156	0.837
SP5	0.757	53.5	34.6	3.278	3.484	0.255	0.0	176	0.803
SP6_1	2.329	164.6	7.6	0.900	1.150	0.056	0.0	44	1.204
SP6_2	2.375	167.9	7.6	1.150	0.900	0.056	0.0	43	1.218
SP6_3	1.459	103.1	7.6	0.900	0.900	0.056	0.0	55	0.863
SP6	0.756	53.5	44.5	3.484	1.075	0.328	0.0	209	0.843
SP7	0.756	53.4	44.5	1.075	1.248	0.328	0.0	209	0.842
SP8	0.750	53.0	44.5	1.248	1.429	0.328	0.0	211	0.837

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
SP1	19.107	298.5	225	Circular	26.850	25.725	0.900	27.350	25.661	1.464
SP2	14.745	294.9	225	Circular	27.350	25.661	1.464	27.850	25.611	2.014
SP3	12.161	296.6	225	Circular	27.850	25.611	2.014	28.500	25.570	2.705
SP4_1	16.760	47.9	225	Circular	30.150	29.025	0.900	29.800	28.675	0.900
SP4_2	9.690	29.8	225	Circular	29.800	27.700	1.875	28.500	27.375	0.900
SP4	29.857	298.6	225	Circular	28.500	25.570	2.705	29.048	25.470	3.353
SP5	17.832	424.6	300	Circular	29.048	25.470	3.278	29.212	25.428	3.484






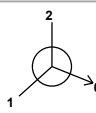
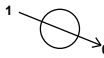

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
SP1	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
SP2	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
SP3	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
SP4_1	S4_1	1200	Manhole	Adoptable	S4_2	1200	Manhole	Adoptable
SP4_2	S4_2	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
SP4	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
SP5	S5	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable

Pipeline Schedule







Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
SP6_1	18.316	45.8	300	Circular	30.850	29.650	0.900	30.700	29.250	1.150
SP6_2	48.169	44.0	300	Circular	30.700	29.250	1.150	29.356	28.156	0.900
SP6_3	16.706	116.0	300	Circular	29.356	28.156	0.900	29.212	28.012	0.900
SP6	22.523	425.0	300	Circular	29.212	25.428	3.484	26.750	25.375	1.075
SP7	19.136	425.2	300	Circular	26.750	25.375	1.075	26.878	25.330	1.248
SP8	25.476	431.8	300	Circular	26.878	25.330	1.248	27.000	25.271	1.429

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
SP6_1	S6_1	1200	Manhole	Adoptable	S6_2	1200	Manhole	Adoptable
SP6_2	S6_2	1200	Manhole	Adoptable	S6_3	1200	Manhole	Adoptable
SP6_3	S6_3	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
SP6	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
SP7	S7	1200	Manhole	Adoptable	ATTN	1200	Manhole	Adoptable
SP8	ATTN	1200	Manhole	Adoptable	S8_OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	524356.638	794466.312	26.850	1.125	1200				
						0	SP1	25.725	225
S2	524349.578	794448.557	27.350	1.689	1200				
						1	SP1	25.661	225
						0	SP2	25.661	225
S3	524344.317	794434.782	27.850	2.239	1200				
						1	SP2	25.611	225
						0	SP3	25.611	225
S4_1	524330.849	794400.588	30.150	1.125	1200				
						0	SP4_1	29.025	225
S4_2	524337.099	794416.139	29.800	2.100	1200				
						1	SP4_1	28.675	225
						0	SP4_2	27.700	225
S4	524344.302	794422.621	28.500	2.930	1200				
						1	SP4_2	27.375	225
						2	SP3	25.570	225
						0	SP4	25.570	225
S5	524371.998	794411.470	29.048	3.578	1200				
						1	SP4	25.470	225
						0	SP5	25.470	300
S6_1	524340.518	794374.264	30.850	1.200	1200				
						0	SP6_1	29.650	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S6_2	524350.344	794358.807	30.700	1.450	1200		1 SP6_1	29.250	300
							0 SP6_2	29.250	300
S6_3	524388.579	794388.104	29.356	1.200	1200		1 SP6_2	28.156	300
							0 SP6_3	28.156	300
S6	524388.540	794404.810	29.212	3.784	1200		1 SP6_3	28.012	300
							2 SP5	25.428	300
							0 SP6	25.428	300
S7	524384.312	794426.933	26.750	1.375	1200		1 SP6	25.375	300
							0 SP7	25.375	300
ATTN	524390.414	794445.070	26.878	1.548	1200		1 SP7	25.330	300
							0 SP8	25.330	300
S8_OUT	524387.538	794470.383	27.000	1.729	1200		1 SP8	25.271	300

Simulation Settings

Rainfall Methodology	FSR	Additional Storage (m ³ /ha)	20.0
FSR Region	Scotland and Ireland	Check Discharge Rate(s)	✓
M5-60 (mm)	16.900	1 year (l/s)	4.7
Ratio-R	0.268	30 year (l/s)	9.3
Summer CV	0.750	100 year (l/s)	11.0
Analysis Speed	Normal	Check Discharge Volume	✓
Skip Steady State	x	100 year 360 minute (m ³)	
Drain Down Time (mins)	240		

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
1	20	0	0
30	0	0	0
30	20	0	0
100	0	0	0
100	20	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.65
Greenfield Method	IH124	Growth Factor 100 year	1.96
Positively Drained Area (ha)	0.990	Betterment (%)	0
SAAR (mm)	1254	QBar	5.6
Soil Index	3	Q 1 year (l/s)	4.7
SPR	0.37	Q 30 year (l/s)	9.3
Region	11	Q 100 year (l/s)	11.0
Growth Factor 1 year	0.83		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.990	Storm Duration (mins)	360
Soil Index	3	Betterment (%)	0
SPR	0.37	PR	
CWI		Runoff Volume (m ³)	

Node ATTN Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	25.330	Product Number	CTL-SHE-0109-4700-0500-4700
Design Depth (m)	0.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.7	Min Node Diameter (mm)	1200

Node ATTN Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	25.330	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	188	Depth (m)	1.050
Safety Factor	2.0	Width (m)	8.800	Inf Depth (m)	
Porosity	0.95	Length (m)	8.800		

Other (defaults)

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

Approval Settings

Node Size	✓	Full Bore Velocity	✓
Node Losses	✓	Minimum Full Bore Velocity (m/s)	
Link Size	✓	Maximum Full Bore Velocity (m/s)	3.000
Minimum Diameter (mm)	150	Proportional Velocity	✓
Link Length	✓	Return Period (years)	
Maximum Length (m)	100.000	Minimum Proportional Velocity (m/s)	0.750
Coordinates	✓	Maximum Proportional Velocity (m/s)	3.000
Accuracy (m)	1.000	Surcharged Depth	✓
Crossings	✓	Return Period (years)	
Cover Depth	✓	Maximum Surcharged Depth (m)	0.100
Minimum Cover Depth (m)		Flooding	✓
Maximum Cover Depth (m)	3.000	Return Period (years)	30
Backdrops	✓	Time to Half Empty	x
Minimum Backdrop Height (m)		Discharge Rates	✓
Maximum Backdrop Height (m)	1.500	Discharge Volume	✓

Approval Settings

100 year 360 minute (m³)

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	89.862	25.428	30 year +20% CC 15 minute summer	239.597	67.798
1 year 30 minute summer	61.984	17.539	30 year +20% CC 30 minute summer	165.305	46.776
1 year 60 minute summer	44.368	11.725	30 year +20% CC 60 minute summer	115.916	30.633
1 year 120 minute summer	29.175	7.710	30 year +20% CC 120 minute summer	74.114	19.586
1 year 180 minute summer	23.360	6.011	30 year +20% CC 180 minute summer	58.181	14.972
1 year 240 minute summer	19.051	5.035	30 year +20% CC 240 minute summer	46.728	12.349
1 year 360 minute summer	15.208	3.914	30 year +20% CC 360 minute summer	36.505	9.394
1 year 480 minute summer	12.374	3.270	30 year +20% CC 480 minute summer	29.244	7.728
1 year 600 minute summer	10.402	2.845	30 year +20% CC 600 minute summer	24.275	6.640
1 year 720 minute summer	9.531	2.554	30 year +20% CC 720 minute summer	21.879	5.864
1 year 960 minute summer	8.088	2.130	30 year +20% CC 960 minute summer	18.298	4.818
1 year 1440 minute summer	6.150	1.648	30 year +20% CC 1440 minute summer	13.628	3.652
1 year +20% CC 15 minute summer	107.835	30.514	100 year 15 minute summer	258.994	73.286
1 year +20% CC 30 minute summer	74.381	21.047	100 year 30 minute summer	179.854	50.893
1 year +20% CC 60 minute summer	53.242	14.070	100 year 60 minute summer	125.429	33.147
1 year +20% CC 120 minute summer	35.010	9.252	100 year 120 minute summer	79.503	21.010
1 year +20% CC 180 minute summer	28.032	7.214	100 year 180 minute summer	62.020	15.960
1 year +20% CC 240 minute summer	22.861	6.041	100 year 240 minute summer	49.571	13.100
1 year +20% CC 360 minute summer	18.250	4.696	100 year 360 minute summer	38.449	9.894
1 year +20% CC 480 minute summer	14.849	3.924	100 year 480 minute summer	30.639	8.097
1 year +20% CC 600 minute summer	12.482	3.414	100 year 600 minute summer	25.325	6.927
1 year +20% CC 720 minute summer	11.438	3.065	100 year 720 minute summer	22.746	6.096
1 year +20% CC 960 minute summer	9.706	2.556	100 year 960 minute summer	18.919	4.982
1 year +20% CC 1440 minute summer	7.380	1.978	100 year 1440 minute summer	13.983	3.747
30 year 15 minute summer	199.664	56.498	100 year +20% CC 15 minute summer	310.792	87.944
30 year 30 minute summer	137.754	38.980	100 year +20% CC 30 minute summer	215.825	61.071
30 year 60 minute summer	96.597	25.528	100 year +20% CC 60 minute summer	150.515	39.777
30 year 120 minute summer	61.762	16.322	100 year +20% CC 120 minute summer	95.403	25.212
30 year 180 minute summer	48.485	12.477	100 year +20% CC 180 minute summer	74.424	19.152
30 year 240 minute summer	38.940	10.291	100 year +20% CC 240 minute summer	59.486	15.720
30 year 360 minute summer	30.421	7.828	100 year +20% CC 360 minute summer	46.139	11.873
30 year 480 minute summer	24.370	6.440	100 year +20% CC 480 minute summer	36.767	9.716
30 year 600 minute summer	20.229	5.533	100 year +20% CC 600 minute summer	30.390	8.312
30 year 720 minute summer	18.232	4.886	100 year +20% CC 720 minute summer	27.295	7.315
30 year 960 minute summer	15.248	4.015	100 year +20% CC 960 minute summer	22.702	5.978
30 year 1440 minute summer	11.357	3.044	100 year +20% CC 1440 minute summer	16.779	4.497

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	10	25.790	0.065	5.6	0.1320	0.0000	OK
15 minute summer	S2	11	25.746	0.085	8.5	0.1228	0.0000	OK
15 minute summer	S3	11	25.712	0.101	8.4	0.1146	0.0000	OK
15 minute summer	S4_1	10	29.064	0.039	4.8	0.0748	0.0000	OK
15 minute summer	S4_2	10	27.755	0.055	11.2	0.0929	0.0000	OK
15 minute summer	S4	11	25.703	0.133	19.1	0.1507	0.0000	OK
15 minute summer	S5	11	25.636	0.166	26.6	0.2563	0.0000	OK
15 minute summer	S6_1	10	29.691	0.041	6.2	0.0837	0.0000	OK
15 minute summer	S6_2	11	29.289	0.039	6.1	0.0439	0.0000	OK
15 minute summer	S6_3	11	28.206	0.050	6.1	0.0566	0.0000	OK
15 minute summer	S6	12	25.606	0.178	33.5	0.2175	0.0000	OK
120 minute summer	S7	84	25.576	0.201	18.7	0.2272	0.0000	OK
120 minute summer	ATTN	84	25.576	0.246	18.1	18.0226	0.0000	OK
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	5.5	0.481	0.184	0.2199	
15 minute summer	S2	SP2	S3	8.4	0.579	0.278	0.2282	
15 minute summer	S3	SP3	S4	8.2	0.424	0.274	0.2542	
15 minute summer	S4_1	SP4_1	S4_2	4.7	1.048	0.063	0.0757	
15 minute summer	S4_2	SP4_2	S4	11.1	1.556	0.117	0.0695	
15 minute summer	S4	SP4	S5	18.8	0.673	0.631	0.8340	
15 minute summer	S5	SP5	S6	25.8	0.620	0.482	0.7440	
15 minute summer	S6_1	SP6_1	S6_2	6.1	1.125	0.037	0.1002	
15 minute summer	S6_2	SP6_2	S6_3	6.1	0.981	0.036	0.3133	
15 minute summer	S6_3	SP6_3	S6	5.9	0.788	0.057	0.1256	
15 minute summer	S6	SP6	S7	33.6	0.832	0.628	0.9089	
15 minute summer	S7	SP7	ATTN	33.7	1.441	0.631	0.5859	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				21.1

Results for 1 year +20% CC Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	10	25.796	0.071	6.7	0.1447	0.0000	OK
15 minute summer	S2	11	25.756	0.095	10.2	0.1382	0.0000	OK
15 minute summer	S3	11	25.732	0.121	9.9	0.1370	0.0000	OK
15 minute summer	S4_1	10	29.068	0.043	5.8	0.0821	0.0000	OK
15 minute summer	S4_2	10	27.761	0.061	13.5	0.1025	0.0000	OK
15 minute summer	S4	11	25.724	0.154	22.7	0.1741	0.0000	OK
15 minute summer	S5	11	25.658	0.188	31.6	0.2901	0.0000	OK
15 minute summer	S6_1	10	29.694	0.044	7.4	0.0913	0.0000	OK
15 minute summer	S6_2	11	29.292	0.042	7.4	0.0478	0.0000	OK
15 minute summer	S6_3	11	28.211	0.055	7.3	0.0622	0.0000	OK
180 minute summer	S6	124	25.635	0.207	17.7	0.2533	0.0000	OK
180 minute summer	S7	124	25.635	0.260	17.2	0.2943	0.0000	OK
180 minute summer	ATTN	124	25.635	0.305	16.3	22.4468	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	6.6	0.501	0.220	0.2541	
15 minute summer	S2	SP2	S3	9.9	0.587	0.330	0.2783	
15 minute summer	S3	SP3	S4	9.8	0.433	0.326	0.3085	
15 minute summer	S4_1	SP4_1	S4_2	5.7	1.105	0.076	0.0865	
15 minute summer	S4_2	SP4_2	S4	13.4	1.633	0.140	0.0795	
15 minute summer	S4	SP4	S5	22.3	0.690	0.747	0.9608	
15 minute summer	S5	SP5	S6	30.8	0.644	0.576	0.8530	
15 minute summer	S6_1	SP6_1	S6_2	7.4	1.182	0.045	0.1139	
15 minute summer	S6_2	SP6_2	S6_3	7.3	1.028	0.043	0.3576	
15 minute summer	S6_3	SP6_3	S6	7.1	0.831	0.069	0.1437	
15 minute summer	S6	SP6	S7	39.9	0.875	0.747	1.0265	
15 minute summer	S7	SP7	ATTN	40.0	1.499	0.748	0.7637	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				18.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	12	26.009	0.284	12.5	0.5791	0.0000	SURCHARGED
15 minute summer	S2	12	25.998	0.337	17.4	0.4891	0.0000	SURCHARGED
15 minute summer	S3	12	25.979	0.368	16.4	0.4166	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.084	0.059	10.8	0.1134	0.0000	OK
15 minute summer	S4_2	10	27.786	0.086	25.1	0.1451	0.0000	OK
15 minute summer	S4	12	25.963	0.393	36.6	0.4444	0.0000	SURCHARGED
240 minute summer	S5	168	25.944	0.474	18.8	0.7325	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.710	0.060	13.7	0.1245	0.0000	OK
15 minute summer	S6_2	10	29.307	0.057	13.6	0.0644	0.0000	OK
15 minute summer	S6_3	11	28.232	0.076	13.4	0.0859	0.0000	OK
240 minute summer	S6	168	25.944	0.516	22.9	0.6298	0.0000	SURCHARGED
240 minute summer	S7	168	25.943	0.568	21.6	0.6427	0.0000	SURCHARGED
240 minute summer	ATTN	168	25.943	0.613	21.2	45.4373	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	11.1	0.549	0.372	0.7599	
15 minute summer	S2	SP2	S3	16.4	0.602	0.547	0.5864	
15 minute summer	S3	SP3	S4	18.8	0.484	0.627	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	10.7	1.317	0.142	0.1359	
15 minute summer	S4_2	SP4_2	S4	24.9	1.913	0.261	0.1264	
15 minute summer	S4	SP4	S5	37.0	0.931	1.240	1.1874	
15 minute summer	S5	SP5	S6	51.4	0.730	0.961	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	13.6	1.406	0.083	0.1774	
15 minute summer	S6_2	SP6_2	S6_3	13.4	1.199	0.080	0.5599	
15 minute summer	S6_3	SP6_3	S6	13.4	0.991	0.130	0.2261	
15 minute summer	S6	SP6	S7	67.4	1.016	1.260	1.5317	
15 minute summer	S7	SP7	ATTN	64.7	1.608	1.210	1.3470	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.2				99.8

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.226	0.501	14.2	1.0207	0.0000	SURCHARGED
30 minute summer	S2	20	26.214	0.553	18.7	0.8028	0.0000	SURCHARGED
30 minute summer	S3	20	26.192	0.581	17.2	0.6569	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.090	0.065	12.9	0.1247	0.0000	OK
15 minute summer	S4_2	10	27.795	0.095	30.0	0.1615	0.0000	OK
30 minute summer	S4	20	26.171	0.601	41.6	0.6796	0.0000	SURCHARGED
240 minute summer	S5	172	26.109	0.639	20.8	0.9866	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.716	0.066	16.4	0.1366	0.0000	OK
15 minute summer	S6_2	10	29.312	0.062	16.3	0.0704	0.0000	OK
15 minute summer	S6_3	11	28.240	0.084	16.1	0.0946	0.0000	OK
240 minute summer	S6	172	26.108	0.680	27.1	0.8305	0.0000	SURCHARGED
240 minute summer	S7	172	26.107	0.732	26.8	0.8284	0.0000	SURCHARGED
240 minute summer	ATTN	172	26.107	0.777	26.4	57.6978	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	13.1	0.557	0.437	0.7599	
15 minute summer	S2	SP2	S3	19.0	0.592	0.632	0.5864	
15 minute summer	S3	SP3	S4	21.5	0.540	0.716	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	12.8	1.382	0.169	0.1547	
15 minute summer	S4_2	SP4_2	S4	29.9	1.998	0.313	0.1450	
15 minute summer	S4	SP4	S5	42.5	1.068	1.422	1.1874	
15 minute summer	S5	SP5	S6	60.8	0.863	1.136	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	16.3	1.478	0.099	0.2020	
15 minute summer	S6_2	SP6_2	S6_3	16.1	1.254	0.096	0.6389	
15 minute summer	S6_3	SP6_3	S6	16.1	1.041	0.156	0.2582	
15 minute summer	S6	SP6	S7	80.8	1.148	1.511	1.5861	
15 minute summer	S7	SP7	ATTN	78.6	1.651	1.470	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.8				118.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.352	0.627	15.4	1.2782	0.0000	SURCHARGED
30 minute summer	S2	20	26.339	0.678	18.9	0.9838	0.0000	SURCHARGED
30 minute summer	S3	20	26.314	0.703	18.5	0.7947	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.093	0.068	14.0	0.1303	0.0000	OK
15 minute summer	S4_2	10	27.800	0.100	32.5	0.1695	0.0000	OK
30 minute summer	S4	20	26.290	0.720	44.6	0.8142	0.0000	SURCHARGED
180 minute summer	S5	140	26.169	0.699	27.6	1.0801	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.719	0.069	17.8	0.1426	0.0000	OK
15 minute summer	S6_2	10	29.315	0.065	17.7	0.0733	0.0000	OK
15 minute summer	S6_3	11	28.243	0.087	17.4	0.0987	0.0000	OK
180 minute summer	S6	140	26.169	0.741	35.6	0.9044	0.0000	SURCHARGED
180 minute summer	S7	140	26.168	0.793	35.0	0.8968	0.0000	SURCHARGED
180 minute summer	ATTN	140	26.167	0.837	34.5	62.2096	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	12.7	0.565	0.424	0.7599	
15 minute summer	S2	SP2	S3	20.1	0.593	0.670	0.5864	
15 minute summer	S3	SP3	S4	22.7	0.571	0.757	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	13.8	1.412	0.184	0.1642	
15 minute summer	S4_2	SP4_2	S4	32.4	2.035	0.338	0.1541	
15 minute summer	S4	SP4	S5	45.5	1.144	1.523	1.1874	
15 minute summer	S5	SP5	S6	64.9	0.921	1.213	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	17.7	1.512	0.107	0.2143	
15 minute summer	S6_2	SP6_2	S6_3	17.4	1.276	0.104	0.6765	
15 minute summer	S6_3	SP6_3	S6	17.4	1.064	0.169	0.2736	
15 minute summer	S6	SP6	S7	85.2	1.209	1.593	1.5861	
15 minute summer	S7	SP7	ATTN	84.9	1.663	1.588	1.3475	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.0				112.2

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.690	0.965	18.5	1.9673	0.0000	FLOOD RISK
30 minute summer	S2	20	26.672	1.011	21.9	1.4671	0.0000	SURCHARGED
30 minute summer	S3	20	26.637	1.026	22.1	1.1608	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.100	0.075	16.8	0.1439	0.0000	OK
15 minute summer	S4_2	10	27.812	0.112	39.1	0.1901	0.0000	OK
30 minute summer	S4	20	26.606	1.036	52.0	1.1712	0.0000	SURCHARGED
240 minute summer	S5	176	26.434	0.964	28.7	1.4894	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.726	0.076	21.3	0.1568	0.0000	OK
15 minute summer	S6_2	10	29.321	0.071	21.2	0.0802	0.0000	OK
15 minute summer	S6_3	11	28.252	0.096	20.9	0.1089	0.0000	OK
240 minute summer	S6	176	26.433	1.005	36.9	1.2276	0.0000	SURCHARGED
240 minute summer	S7	176	26.432	1.057	36.4	1.1957	0.0000	SURCHARGED
240 minute summer	ATTN	176	26.431	1.101	35.9	78.1980	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.9	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	14.7	0.573	0.490	0.7599	
15 minute summer	S2	SP2	S3	23.3	0.594	0.776	0.5864	
15 minute summer	S3	SP3	S4	26.8	0.674	0.894	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	16.6	1.482	0.221	0.1880	
15 minute summer	S4_2	SP4_2	S4	38.9	2.122	0.407	0.1777	
15 minute summer	S4	SP4	S5	53.0	1.334	1.775	1.1874	
15 minute summer	S5	SP5	S6	74.7	1.060	1.396	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	21.2	1.587	0.129	0.2445	
15 minute summer	S6_2	SP6_2	S6_3	20.9	1.334	0.124	0.7734	
15 minute summer	S6_3	SP6_3	S6	20.9	1.117	0.203	0.3128	
15 minute summer	S6	SP6	S7	99.9	1.419	1.870	1.5861	
15 minute summer	S7	SP7	ATTN	98.5	1.673	1.844	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.8				139.3

Results for 1 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	10	25.790	0.065	5.6	0.1320	0.0000	OK
15 minute summer	S2	11	25.746	0.085	8.5	0.1228	0.0000	OK
15 minute summer	S3	11	25.712	0.101	8.4	0.1146	0.0000	OK
15 minute summer	S4_1	10	29.064	0.039	4.8	0.0748	0.0000	OK
15 minute summer	S4_2	10	27.755	0.055	11.2	0.0929	0.0000	OK
15 minute summer	S4	11	25.703	0.133	19.1	0.1507	0.0000	OK
15 minute summer	S5	11	25.636	0.166	26.6	0.2563	0.0000	OK
15 minute summer	S6_1	10	29.691	0.041	6.2	0.0837	0.0000	OK
15 minute summer	S6_2	11	29.289	0.039	6.1	0.0439	0.0000	OK
15 minute summer	S6_3	11	28.206	0.050	6.1	0.0566	0.0000	OK
15 minute summer	S6	12	25.606	0.178	33.5	0.2175	0.0000	OK
15 minute summer	S7	12	25.531	0.156	33.6	0.1768	0.0000	OK
15 minute summer	ATTN	19	25.487	0.157	33.7	11.4129	0.0000	OK
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	5.5	0.481	0.184	0.2199	
15 minute summer	S2	SP2	S3	8.4	0.579	0.278	0.2282	
15 minute summer	S3	SP3	S4	8.2	0.424	0.274	0.2542	
15 minute summer	S4_1	SP4_1	S4_2	4.7	1.048	0.063	0.0757	
15 minute summer	S4_2	SP4_2	S4	11.1	1.556	0.117	0.0695	
15 minute summer	S4	SP4	S5	18.8	0.673	0.631	0.8340	
15 minute summer	S5	SP5	S6	25.8	0.620	0.482	0.7440	
15 minute summer	S6_1	SP6_1	S6_2	6.1	1.125	0.037	0.1002	
15 minute summer	S6_2	SP6_2	S6_3	6.1	0.981	0.036	0.3133	
15 minute summer	S6_3	SP6_3	S6	5.9	0.788	0.057	0.1256	
15 minute summer	S6	SP6	S7	33.6	0.832	0.628	0.9089	
15 minute summer	S7	SP7	ATTN	33.7	1.441	0.631	0.5859	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				15.2

Results for 1 year 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	18	25.788	0.063	5.3	0.1293	0.0000	OK
30 minute summer	S2	18	25.744	0.083	8.1	0.1198	0.0000	OK
30 minute summer	S3	19	25.709	0.098	8.0	0.1107	0.0000	OK
30 minute summer	S4_1	18	29.063	0.038	4.6	0.0736	0.0000	OK
30 minute summer	S4_2	18	27.754	0.054	10.7	0.0907	0.0000	OK
30 minute summer	S4	19	25.699	0.129	18.3	0.1464	0.0000	OK
30 minute summer	S5	19	25.633	0.163	25.4	0.2520	0.0000	OK
30 minute summer	S6_1	18	29.689	0.039	5.8	0.0811	0.0000	OK
30 minute summer	S6_2	18	29.288	0.038	5.8	0.0429	0.0000	OK
30 minute summer	S6_3	19	28.205	0.049	5.8	0.0553	0.0000	OK
30 minute summer	S6	19	25.603	0.175	32.5	0.2134	0.0000	OK
30 minute summer	S7	21	25.535	0.160	32.3	0.1807	0.0000	OK
30 minute summer	ATTN	30	25.526	0.196	31.7	14.2971	0.0000	OK
30 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	5.3	0.474	0.177	0.2135	
30 minute summer	S2	SP2	S3	8.0	0.569	0.266	0.2173	
30 minute summer	S3	SP3	S4	8.0	0.419	0.265	0.2444	
30 minute summer	S4_1	SP4_1	S4_2	4.6	1.040	0.061	0.0741	
30 minute summer	S4_2	SP4_2	S4	10.7	1.540	0.112	0.0673	
30 minute summer	S4	SP4	S5	18.2	0.667	0.609	0.8131	
30 minute summer	S5	SP5	S6	25.2	0.617	0.471	0.7285	
30 minute summer	S6_1	SP6_1	S6_2	5.8	1.102	0.035	0.0967	
30 minute summer	S6_2	SP6_2	S6_3	5.8	0.945	0.034	0.3001	
30 minute summer	S6_3	SP6_3	S6	5.7	0.780	0.055	0.1217	
30 minute summer	S6	SP6	S7	32.3	0.817	0.604	0.8921	
30 minute summer	S7	SP7	ATTN	31.7	1.182	0.592	0.8068	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				21.1

Results for 1 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	33	25.781	0.056	4.2	0.1150	0.0000	OK
60 minute summer	S2	33	25.734	0.073	6.4	0.1054	0.0000	OK
60 minute summer	S3	34	25.691	0.080	6.4	0.0906	0.0000	OK
60 minute summer	S4_1	33	29.060	0.035	3.7	0.0660	0.0000	OK
60 minute summer	S4_2	33	27.748	0.048	8.6	0.0808	0.0000	OK
60 minute summer	S4	34	25.681	0.111	14.8	0.1256	0.0000	OK
60 minute summer	S5	34	25.613	0.143	20.6	0.2210	0.0000	OK
60 minute summer	S6_1	33	29.685	0.035	4.6	0.0724	0.0000	OK
60 minute summer	S6_2	33	29.284	0.034	4.6	0.0385	0.0000	OK
60 minute summer	S6_3	34	28.200	0.044	4.6	0.0494	0.0000	OK
60 minute summer	S6	34	25.584	0.156	26.3	0.1909	0.0000	OK
60 minute summer	S7	48	25.557	0.182	26.2	0.2060	0.0000	OK
60 minute summer	ATTN	48	25.557	0.227	25.7	16.6150	0.0000	OK
60 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	4.2	0.447	0.140	0.1800	
60 minute summer	S2	SP2	S3	6.4	0.549	0.212	0.1739	
60 minute summer	S3	SP3	S4	6.4	0.403	0.212	0.1957	
60 minute summer	S4_1	SP4_1	S4_2	3.7	0.978	0.049	0.0634	
60 minute summer	S4_2	SP4_2	S4	8.6	1.452	0.090	0.0574	
60 minute summer	S4	SP4	S5	14.7	0.638	0.494	0.6888	
60 minute summer	S5	SP5	S6	20.5	0.586	0.383	0.6263	
60 minute summer	S6_1	SP6_1	S6_2	4.6	1.028	0.028	0.0822	
60 minute summer	S6_2	SP6_2	S6_3	4.6	0.872	0.027	0.2568	
60 minute summer	S6_3	SP6_3	S6	4.5	0.731	0.044	0.1038	
60 minute summer	S6	SP6	S7	26.2	0.724	0.489	0.8332	
60 minute summer	S7	SP7	ATTN	25.7	0.834	0.482	0.9752	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				28.3

Results for 1 year 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	64	25.773	0.048	3.0	0.0972	0.0000	OK
120 minute summer	S2	64	25.722	0.061	4.6	0.0888	0.0000	OK
120 minute summer	S3	64	25.673	0.062	4.6	0.0698	0.0000	OK
120 minute summer	S4_1	64	29.054	0.029	2.6	0.0555	0.0000	OK
120 minute summer	S4_2	64	27.740	0.040	6.0	0.0672	0.0000	OK
120 minute summer	S4	64	25.661	0.091	10.6	0.1031	0.0000	OK
120 minute summer	S5	64	25.586	0.116	14.8	0.1789	0.0000	OK
120 minute summer	S6_1	64	29.680	0.030	3.3	0.0616	0.0000	OK
120 minute summer	S6_2	64	29.279	0.029	3.3	0.0329	0.0000	OK
120 minute summer	S6_3	64	28.193	0.037	3.3	0.0421	0.0000	OK
120 minute summer	S6	84	25.576	0.148	18.9	0.1811	0.0000	OK
120 minute summer	S7	84	25.576	0.201	18.7	0.2272	0.0000	OK
120 minute summer	ATTN	84	25.576	0.246	18.1	18.0226	0.0000	OK
120 minute summer	S8_OUT	2	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	3.0	0.406	0.100	0.1418	
120 minute summer	S2	SP2	S3	4.6	0.526	0.153	0.1293	
120 minute summer	S3	SP3	S4	4.6	0.385	0.152	0.1452	
120 minute summer	S4_1	SP4_1	S4_2	2.6	0.882	0.035	0.0494	
120 minute summer	S4_2	SP4_2	S4	6.0	1.313	0.063	0.0443	
120 minute summer	S4	SP4	S5	10.5	0.591	0.352	0.5322	
120 minute summer	S5	SP5	S6	14.7	0.543	0.274	0.5113	
120 minute summer	S6_1	SP6_1	S6_2	3.3	0.931	0.020	0.0650	
120 minute summer	S6_2	SP6_2	S6_3	3.3	0.785	0.020	0.2043	
120 minute summer	S6_3	SP6_3	S6	3.3	0.664	0.032	0.0823	
120 minute summer	S6	SP6	S7	18.7	0.633	0.350	0.9557	
120 minute summer	S7	SP7	ATTN	18.1	0.624	0.339	1.0707	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				37.5

Results for 1 year 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	96	25.767	0.042	2.3	0.0854	0.0000	OK
180 minute summer	S2	96	25.714	0.053	3.5	0.0772	0.0000	OK
180 minute summer	S3	96	25.662	0.051	3.5	0.0582	0.0000	OK
180 minute summer	S4_1	96	29.051	0.026	2.0	0.0490	0.0000	OK
180 minute summer	S4_2	96	27.735	0.035	4.7	0.0594	0.0000	OK
180 minute summer	S4	96	25.650	0.080	8.2	0.0901	0.0000	OK
180 minute summer	S5	120	25.576	0.106	11.6	0.1633	0.0000	OK
180 minute summer	S6_1	96	29.676	0.026	2.5	0.0540	0.0000	OK
180 minute summer	S6_2	96	29.276	0.026	2.5	0.0289	0.0000	OK
180 minute summer	S6_3	96	28.189	0.033	2.5	0.0370	0.0000	OK
180 minute summer	S6	120	25.575	0.147	14.9	0.1793	0.0000	OK
180 minute summer	S7	120	25.574	0.199	14.8	0.2254	0.0000	OK
180 minute summer	ATTN	120	25.574	0.244	14.1	17.8945	0.0000	OK
180 minute summer	S8_OUT	4	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	2.3	0.377	0.077	0.1170	
180 minute summer	S2	SP2	S3	3.5	0.501	0.116	0.1031	
180 minute summer	S3	SP3	S4	3.5	0.365	0.117	0.1179	
180 minute summer	S4_1	SP4_1	S4_2	2.0	0.815	0.027	0.0411	
180 minute summer	S4_2	SP4_2	S4	4.7	1.228	0.049	0.0371	
180 minute summer	S4	SP4	S5	8.2	0.553	0.274	0.4431	
180 minute summer	S5	SP5	S6	11.6	0.516	0.217	0.5031	
180 minute summer	S6_1	SP6_1	S6_2	2.5	0.859	0.015	0.0534	
180 minute summer	S6_2	SP6_2	S6_3	2.5	0.721	0.015	0.1684	
180 minute summer	S6_3	SP6_3	S6	2.5	0.613	0.024	0.0680	
180 minute summer	S6	SP6	S7	14.8	0.585	0.277	0.9456	
180 minute summer	S7	SP7	ATTN	14.1	0.575	0.264	1.0626	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				43.8

Results for 1 year 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	124	25.764	0.039	2.0	0.0795	0.0000	OK
240 minute summer	S2	124	25.711	0.050	3.1	0.0721	0.0000	OK
240 minute summer	S3	124	25.659	0.048	3.1	0.0542	0.0000	OK
240 minute summer	S4_1	124	29.049	0.024	1.7	0.0451	0.0000	OK
240 minute summer	S4_2	124	27.732	0.032	4.0	0.0546	0.0000	OK
240 minute summer	S4	124	25.643	0.073	7.0	0.0827	0.0000	OK
240 minute summer	S5	152	25.568	0.098	9.9	0.1512	0.0000	OK
240 minute summer	S6_1	124	29.675	0.025	2.2	0.0508	0.0000	OK
240 minute summer	S6_2	124	29.274	0.024	2.2	0.0271	0.0000	OK
240 minute summer	S6_3	124	28.186	0.030	2.2	0.0344	0.0000	OK
240 minute summer	S6	152	25.567	0.139	12.6	0.1693	0.0000	OK
240 minute summer	S7	152	25.566	0.191	12.5	0.2159	0.0000	OK
240 minute summer	ATTN	152	25.565	0.235	11.9	17.2603	0.0000	OK
240 minute summer	S8_OUT	4	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	2.0	0.360	0.066	0.1058	
240 minute summer	S2	SP2	S3	3.1	0.483	0.102	0.0932	
240 minute summer	S3	SP3	S4	3.0	0.353	0.101	0.1054	
240 minute summer	S4_1	SP4_1	S4_2	1.7	0.775	0.022	0.0365	
240 minute summer	S4_2	SP4_2	S4	4.0	1.169	0.042	0.0330	
240 minute summer	S4	SP4	S5	7.0	0.533	0.233	0.3901	
240 minute summer	S5	SP5	S6	9.8	0.500	0.182	0.4615	
240 minute summer	S6_1	SP6_1	S6_2	2.2	0.824	0.013	0.0487	
240 minute summer	S6_2	SP6_2	S6_3	2.2	0.694	0.013	0.1523	
240 minute summer	S6_3	SP6_3	S6	2.2	0.587	0.021	0.0613	
240 minute summer	S6	SP6	S7	12.5	0.550	0.233	0.8909	
240 minute summer	S7	SP7	ATTN	11.9	0.560	0.223	1.0201	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				49.0

Results for 1 year 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	184	25.760	0.035	1.6	0.0712	0.0000	OK
360 minute summer	S2	184	25.705	0.044	2.5	0.0645	0.0000	OK
360 minute summer	S3	184	25.654	0.043	2.5	0.0485	0.0000	OK
360 minute summer	S4_1	184	29.046	0.021	1.4	0.0411	0.0000	OK
360 minute summer	S4_2	184	27.729	0.029	3.3	0.0496	0.0000	OK
360 minute summer	S4	184	25.636	0.066	5.7	0.0742	0.0000	OK
360 minute summer	S5	216	25.552	0.082	7.9	0.1265	0.0000	OK
360 minute summer	S6_1	184	29.672	0.022	1.8	0.0462	0.0000	OK
360 minute summer	S6_2	184	29.272	0.022	1.8	0.0246	0.0000	OK
360 minute summer	S6_3	184	28.183	0.027	1.8	0.0310	0.0000	OK
360 minute summer	S6	216	25.549	0.121	10.1	0.1482	0.0000	OK
360 minute summer	S7	216	25.548	0.173	9.9	0.1956	0.0000	OK
360 minute summer	ATTN	224	25.547	0.217	9.5	15.9067	0.0000	OK
360 minute summer	S8_OUT	8	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	1.6	0.337	0.053	0.0902	
360 minute summer	S2	SP2	S3	2.5	0.454	0.082	0.0796	
360 minute summer	S3	SP3	S4	2.4	0.330	0.081	0.0904	
360 minute summer	S4_1	SP4_1	S4_2	1.4	0.732	0.018	0.0318	
360 minute summer	S4_2	SP4_2	S4	3.3	1.106	0.034	0.0287	
360 minute summer	S4	SP4	S5	5.6	0.508	0.189	0.3319	
360 minute summer	S5	SP5	S6	7.8	0.481	0.147	0.3767	
360 minute summer	S6_1	SP6_1	S6_2	1.8	0.775	0.011	0.0423	
360 minute summer	S6_2	SP6_2	S6_3	1.8	0.652	0.011	0.1309	
360 minute summer	S6_3	SP6_3	S6	1.7	0.551	0.017	0.0524	
360 minute summer	S6	SP6	S7	9.9	0.508	0.186	0.7742	
360 minute summer	S7	SP7	ATTN	9.5	0.492	0.179	0.9254	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				57.5

Results for 1 year 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	248	25.757	0.032	1.3	0.0647	0.0000	OK
480 minute summer	S2	248	25.701	0.040	2.0	0.0582	0.0000	OK
480 minute summer	S3	248	25.650	0.039	2.0	0.0442	0.0000	OK
480 minute summer	S4_1	248	29.044	0.019	1.1	0.0368	0.0000	OK
480 minute summer	S4_2	248	27.726	0.026	2.6	0.0443	0.0000	OK
480 minute summer	S4	248	25.629	0.059	4.6	0.0669	0.0000	OK
480 minute summer	S5	248	25.542	0.072	6.5	0.1114	0.0000	OK
480 minute summer	S6_1	248	29.670	0.020	1.4	0.0413	0.0000	OK
480 minute summer	S6_2	248	29.270	0.020	1.4	0.0222	0.0000	OK
480 minute summer	S6_3	248	28.181	0.025	1.4	0.0280	0.0000	OK
480 minute summer	S6	280	25.527	0.099	8.3	0.1206	0.0000	OK
480 minute summer	S7	280	25.525	0.150	8.3	0.1693	0.0000	OK
480 minute summer	ATTN	280	25.524	0.194	8.0	14.1614	0.0000	OK
480 minute summer	S8_OUT	8	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	1.3	0.319	0.044	0.0781	
480 minute summer	S2	SP2	S3	2.0	0.427	0.067	0.0690	
480 minute summer	S3	SP3	S4	2.0	0.313	0.067	0.0784	
480 minute summer	S4_1	SP4_1	S4_2	1.1	0.683	0.015	0.0270	
480 minute summer	S4_2	SP4_2	S4	2.6	1.033	0.027	0.0244	
480 minute summer	S4	SP4	S5	4.6	0.479	0.154	0.2874	
480 minute summer	S5	SP5	S6	6.5	0.463	0.122	0.2738	
480 minute summer	S6_1	SP6_1	S6_2	1.4	0.719	0.009	0.0357	
480 minute summer	S6_2	SP6_2	S6_3	1.4	0.603	0.008	0.1122	
480 minute summer	S6_3	SP6_3	S6	1.4	0.517	0.014	0.0453	
480 minute summer	S6	SP6	S7	8.3	0.490	0.155	0.6228	
480 minute summer	S7	SP7	ATTN	8.0	0.455	0.150	0.7971	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				63.3

Results for 1 year 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	315	25.754	0.029	1.1	0.0598	0.0000	OK
600 minute summer	S2	315	25.698	0.037	1.7	0.0536	0.0000	OK
600 minute summer	S3	315	25.647	0.036	1.7	0.0408	0.0000	OK
600 minute summer	S4_1	315	29.043	0.018	1.0	0.0351	0.0000	OK
600 minute summer	S4_2	315	27.725	0.025	2.3	0.0418	0.0000	OK
600 minute summer	S4	315	25.625	0.055	4.0	0.0623	0.0000	OK
600 minute summer	S5	315	25.537	0.066	5.6	0.1027	0.0000	OK
600 minute summer	S6_1	315	29.669	0.019	1.2	0.0383	0.0000	OK
600 minute summer	S6_2	315	29.268	0.018	1.2	0.0206	0.0000	OK
600 minute summer	S6_3	315	28.179	0.023	1.2	0.0260	0.0000	OK
600 minute summer	S6	345	25.512	0.084	7.2	0.1029	0.0000	OK
600 minute summer	S7	345	25.509	0.134	7.1	0.1515	0.0000	OK
600 minute summer	ATTN	345	25.508	0.178	7.0	12.9692	0.0000	OK
600 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	1.1	0.304	0.037	0.0694	
600 minute summer	S2	SP2	S3	1.7	0.408	0.057	0.0615	
600 minute summer	S3	SP3	S4	1.7	0.296	0.057	0.0706	
600 minute summer	S4_1	SP4_1	S4_2	1.0	0.663	0.013	0.0253	
600 minute summer	S4_2	SP4_2	S4	2.3	0.997	0.024	0.0224	
600 minute summer	S4	SP4	S5	4.0	0.463	0.134	0.2584	
600 minute summer	S5	SP5	S6	5.6	0.448	0.105	0.2247	
600 minute summer	S6_1	SP6_1	S6_2	1.2	0.685	0.007	0.0321	
600 minute summer	S6_2	SP6_2	S6_3	1.2	0.579	0.007	0.1009	
600 minute summer	S6_3	SP6_3	S6	1.2	0.492	0.012	0.0407	
600 minute summer	S6	SP6	S7	7.1	0.475	0.134	0.5250	
600 minute summer	S7	SP7	ATTN	7.0	0.446	0.130	0.7079	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				69.7

Results for 1 year 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	375	25.753	0.028	1.0	0.0571	0.0000	OK
720 minute summer	S2	375	25.696	0.035	1.5	0.0504	0.0000	OK
720 minute summer	S3	375	25.645	0.034	1.5	0.0384	0.0000	OK
720 minute summer	S4_1	375	29.042	0.017	0.9	0.0334	0.0000	OK
720 minute summer	S4_2	375	27.724	0.024	2.1	0.0399	0.0000	OK
720 minute summer	S4	375	25.622	0.052	3.6	0.0591	0.0000	OK
720 minute summer	S5	375	25.533	0.063	5.1	0.0978	0.0000	OK
720 minute summer	S6_1	375	29.668	0.018	1.1	0.0367	0.0000	OK
720 minute summer	S6_2	375	29.267	0.017	1.1	0.0197	0.0000	OK
720 minute summer	S6_3	375	28.178	0.022	1.1	0.0250	0.0000	OK
720 minute summer	S6	375	25.498	0.070	6.5	0.0852	0.0000	OK
720 minute summer	S7	405	25.489	0.114	6.5	0.1286	0.0000	OK
720 minute summer	ATTN	405	25.487	0.157	6.4	11.4217	0.0000	OK
720 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	1.0	0.299	0.033	0.0640	
720 minute summer	S2	SP2	S3	1.5	0.394	0.050	0.0562	
720 minute summer	S3	SP3	S4	1.5	0.283	0.050	0.0652	
720 minute summer	S4_1	SP4_1	S4_2	0.9	0.641	0.012	0.0235	
720 minute summer	S4_2	SP4_2	S4	2.1	0.971	0.022	0.0210	
720 minute summer	S4	SP4	S5	3.6	0.448	0.121	0.2405	
720 minute summer	S5	SP5	S6	5.1	0.440	0.095	0.2069	
720 minute summer	S6_1	SP6_1	S6_2	1.1	0.667	0.007	0.0302	
720 minute summer	S6_2	SP6_2	S6_3	1.1	0.566	0.007	0.0949	
720 minute summer	S6_3	SP6_3	S6	1.1	0.479	0.011	0.0383	
720 minute summer	S6	SP6	S7	6.5	0.461	0.122	0.4083	
720 minute summer	S7	SP7	ATTN	6.4	0.406	0.119	0.5920	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				73.7

Results for 1 year 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	495	25.752	0.027	0.9	0.0543	0.0000	OK
960 minute summer	S2	495	25.695	0.034	1.4	0.0487	0.0000	OK
960 minute summer	S3	495	25.644	0.033	1.4	0.0372	0.0000	OK
960 minute summer	S4_1	480	29.041	0.016	0.7	0.0298	0.0000	OK
960 minute summer	S4_2	495	27.721	0.021	1.7	0.0360	0.0000	OK
960 minute summer	S4	495	25.619	0.049	3.1	0.0549	0.0000	OK
960 minute summer	S5	495	25.528	0.058	4.3	0.0892	0.0000	OK
960 minute summer	S6_1	495	29.666	0.016	0.9	0.0334	0.0000	OK
960 minute summer	S6_2	495	29.266	0.016	0.9	0.0180	0.0000	OK
960 minute summer	S6_3	495	28.176	0.020	0.9	0.0228	0.0000	OK
960 minute summer	S6	495	25.492	0.064	5.5	0.0783	0.0000	OK
960 minute summer	S7	525	25.465	0.090	5.5	0.1020	0.0000	OK
960 minute summer	ATTN	525	25.463	0.133	5.4	9.5890	0.0000	OK
960 minute summer	S8_OUT	15	25.271	0.000	4.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	0.9	0.286	0.030	0.0604	
960 minute summer	S2	SP2	S3	1.4	0.386	0.047	0.0535	
960 minute summer	S3	SP3	S4	1.4	0.287	0.047	0.0599	
960 minute summer	S4_1	SP4_1	S4_2	0.7	0.594	0.009	0.0198	
960 minute summer	S4_2	SP4_2	S4	1.7	0.913	0.018	0.0180	
960 minute summer	S4	SP4	S5	3.1	0.434	0.104	0.2136	
960 minute summer	S5	SP5	S6	4.3	0.420	0.080	0.1826	
960 minute summer	S6_1	SP6_1	S6_2	0.9	0.628	0.005	0.0263	
960 minute summer	S6_2	SP6_2	S6_3	0.9	0.527	0.005	0.0825	
960 minute summer	S6_3	SP6_3	S6	0.9	0.451	0.009	0.0333	
960 minute summer	S6	SP6	S7	5.5	0.453	0.103	0.3174	
960 minute summer	S7	SP7	ATTN	5.4	0.406	0.102	0.4581	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.6				83.1

Results for 1 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	750	25.749	0.024	0.7	0.0483	0.0000	OK
1440 minute summer	S2	750	25.689	0.028	1.0	0.0413	0.0000	OK
1440 minute summer	S3	750	25.639	0.028	1.0	0.0316	0.0000	OK
1440 minute summer	S4_1	750	29.040	0.015	0.6	0.0278	0.0000	OK
1440 minute summer	S4_2	750	27.719	0.019	1.4	0.0328	0.0000	OK
1440 minute summer	S4	750	25.613	0.043	2.4	0.0484	0.0000	OK
1440 minute summer	S5	750	25.520	0.050	3.3	0.0777	0.0000	OK
1440 minute summer	S6_1	750	29.664	0.014	0.7	0.0297	0.0000	OK
1440 minute summer	S6_2	750	29.264	0.014	0.7	0.0160	0.0000	OK
1440 minute summer	S6_3	750	28.174	0.018	0.7	0.0202	0.0000	OK
1440 minute summer	S6	720	25.485	0.057	4.2	0.0693	0.0000	OK
1440 minute summer	S7	750	25.440	0.065	4.2	0.0740	0.0000	OK
1440 minute summer	ATTN	750	25.434	0.104	4.2	7.4587	0.0000	OK
1440 minute summer	S8_OUT	30	25.271	0.000	3.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	0.7	0.275	0.023	0.0488	
1440 minute summer	S2	SP2	S3	1.0	0.349	0.033	0.0422	
1440 minute summer	S3	SP3	S4	1.0	0.251	0.033	0.0490	
1440 minute summer	S4_1	SP4_1	S4_2	0.6	0.567	0.008	0.0177	
1440 minute summer	S4_2	SP4_2	S4	1.4	0.863	0.015	0.0157	
1440 minute summer	S4	SP4	S5	2.4	0.406	0.080	0.1768	
1440 minute summer	S5	SP5	S6	3.3	0.392	0.062	0.1504	
1440 minute summer	S6_1	SP6_1	S6_2	0.7	0.584	0.004	0.0220	
1440 minute summer	S6_2	SP6_2	S6_3	0.7	0.488	0.004	0.0691	
1440 minute summer	S6_3	SP6_3	S6	0.7	0.418	0.007	0.0280	
1440 minute summer	S6	SP6	S7	4.2	0.437	0.079	0.2300	
1440 minute summer	S7	SP7	ATTN	4.2	0.350	0.078	0.3164	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	3.9				97.7

Results for 1 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	10	25.796	0.071	6.7	0.1447	0.0000	OK
15 minute summer	S2	11	25.756	0.095	10.2	0.1382	0.0000	OK
15 minute summer	S3	11	25.732	0.121	9.9	0.1370	0.0000	OK
15 minute summer	S4_1	10	29.068	0.043	5.8	0.0821	0.0000	OK
15 minute summer	S4_2	10	27.761	0.061	13.5	0.1025	0.0000	OK
15 minute summer	S4	11	25.724	0.154	22.7	0.1741	0.0000	OK
15 minute summer	S5	11	25.658	0.188	31.6	0.2901	0.0000	OK
15 minute summer	S6_1	10	29.694	0.044	7.4	0.0913	0.0000	OK
15 minute summer	S6_2	11	29.292	0.042	7.4	0.0478	0.0000	OK
15 minute summer	S6_3	11	28.211	0.055	7.3	0.0622	0.0000	OK
15 minute summer	S6	12	25.626	0.198	40.1	0.2423	0.0000	OK
15 minute summer	S7	12	25.547	0.172	39.9	0.1943	0.0000	OK
15 minute summer	ATTN	19	25.519	0.189	40.0	13.7535	0.0000	OK
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	6.6	0.501	0.220	0.2541	
15 minute summer	S2	SP2	S3	9.9	0.587	0.330	0.2783	
15 minute summer	S3	SP3	S4	9.8	0.433	0.326	0.3085	
15 minute summer	S4_1	SP4_1	S4_2	5.7	1.105	0.076	0.0865	
15 minute summer	S4_2	SP4_2	S4	13.4	1.633	0.140	0.0795	
15 minute summer	S4	SP4	S5	22.3	0.690	0.747	0.9608	
15 minute summer	S5	SP5	S6	30.8	0.644	0.576	0.8530	
15 minute summer	S6_1	SP6_1	S6_2	7.4	1.182	0.045	0.1139	
15 minute summer	S6_2	SP6_2	S6_3	7.3	1.028	0.043	0.3576	
15 minute summer	S6_3	SP6_3	S6	7.1	0.831	0.069	0.1437	
15 minute summer	S6	SP6	S7	39.9	0.875	0.747	1.0265	
15 minute summer	S7	SP7	ATTN	40.0	1.499	0.748	0.7637	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				18.3

Results for 1 year +20% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	18	25.795	0.070	6.4	0.1425	0.0000	OK
30 minute summer	S2	18	25.754	0.093	9.8	0.1346	0.0000	OK
30 minute summer	S3	19	25.729	0.118	9.6	0.1333	0.0000	OK
30 minute summer	S4_1	18	29.067	0.042	5.5	0.0805	0.0000	OK
30 minute summer	S4_2	18	27.759	0.059	12.9	0.1003	0.0000	OK
30 minute summer	S4	19	25.720	0.150	22.0	0.1698	0.0000	OK
30 minute summer	S5	19	25.655	0.185	30.4	0.2855	0.0000	OK
30 minute summer	S6_1	18	29.693	0.043	7.0	0.0889	0.0000	OK
30 minute summer	S6_2	18	29.292	0.041	7.0	0.0469	0.0000	OK
30 minute summer	S6_3	19	28.210	0.054	7.0	0.0608	0.0000	OK
30 minute summer	S6	19	25.624	0.196	38.9	0.2392	0.0000	OK
30 minute summer	S7	31	25.566	0.191	38.7	0.2163	0.0000	OK
30 minute summer	ATTN	32	25.566	0.236	37.8	17.3089	0.0000	OK
30 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	6.4	0.497	0.214	0.2477	
30 minute summer	S2	SP2	S3	9.6	0.575	0.320	0.2675	
30 minute summer	S3	SP3	S4	9.5	0.420	0.317	0.2991	
30 minute summer	S4_1	SP4_1	S4_2	5.5	1.095	0.073	0.0842	
30 minute summer	S4_2	SP4_2	S4	12.9	1.618	0.135	0.0772	
30 minute summer	S4	SP4	S5	21.7	0.687	0.727	0.9412	
30 minute summer	S5	SP5	S6	30.1	0.641	0.563	0.8404	
30 minute summer	S6_1	SP6_1	S6_2	7.0	1.164	0.043	0.1105	
30 minute summer	S6_2	SP6_2	S6_3	7.0	0.995	0.042	0.3441	
30 minute summer	S6_3	SP6_3	S6	6.9	0.823	0.067	0.1395	
30 minute summer	S6	SP6	S7	38.7	0.854	0.723	1.0415	
30 minute summer	S7	SP7	ATTN	37.8	1.200	0.707	1.0226	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				25.3

Results for 1 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	33	25.787	0.062	5.1	0.1268	0.0000	OK
60 minute summer	S2	33	25.742	0.081	7.8	0.1174	0.0000	OK
60 minute summer	S3	34	25.706	0.095	7.7	0.1076	0.0000	OK
60 minute summer	S4_1	33	29.063	0.038	4.4	0.0720	0.0000	OK
60 minute summer	S4_2	33	27.753	0.053	10.3	0.0889	0.0000	OK
60 minute summer	S4	34	25.697	0.127	17.8	0.1436	0.0000	OK
60 minute summer	S5	34	25.633	0.163	24.9	0.2512	0.0000	OK
60 minute summer	S6_1	33	29.689	0.039	5.6	0.0797	0.0000	OK
60 minute summer	S6_2	33	29.287	0.037	5.6	0.0422	0.0000	OK
60 minute summer	S6_3	34	28.204	0.048	5.6	0.0545	0.0000	OK
60 minute summer	S6	51	25.608	0.180	31.8	0.2194	0.0000	OK
60 minute summer	S7	51	25.607	0.232	31.5	0.2627	0.0000	OK
60 minute summer	ATTN	52	25.607	0.277	30.8	20.3608	0.0000	OK
60 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	5.1	0.469	0.170	0.2079	
60 minute summer	S2	SP2	S3	7.7	0.555	0.257	0.2106	
60 minute summer	S3	SP3	S4	7.7	0.410	0.257	0.2373	
60 minute summer	S4_1	SP4_1	S4_2	4.4	1.027	0.058	0.0718	
60 minute summer	S4_2	SP4_2	S4	10.3	1.524	0.108	0.0655	
60 minute summer	S4	SP4	S5	17.7	0.658	0.594	0.8032	
60 minute summer	S5	SP5	S6	24.7	0.605	0.461	0.7322	
60 minute summer	S6_1	SP6_1	S6_2	5.6	1.089	0.034	0.0943	
60 minute summer	S6_2	SP6_2	S6_3	5.6	0.921	0.033	0.2950	
60 minute summer	S6_3	SP6_3	S6	5.5	0.774	0.054	0.1194	
60 minute summer	S6	SP6	S7	31.5	0.749	0.590	1.1551	
60 minute summer	S7	SP7	ATTN	30.8	0.825	0.576	1.2105	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				34.1

Results for 1 year +20% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	64	25.777	0.052	3.6	0.1065	0.0000	OK
120 minute summer	S2	64	25.728	0.067	5.5	0.0975	0.0000	OK
120 minute summer	S3	64	25.681	0.070	5.5	0.0795	0.0000	OK
120 minute summer	S4_1	64	29.057	0.032	3.1	0.0605	0.0000	OK
120 minute summer	S4_2	64	27.744	0.044	7.2	0.0737	0.0000	OK
120 minute summer	S4	64	25.671	0.101	12.7	0.1141	0.0000	OK
120 minute summer	S5	86	25.634	0.164	17.8	0.2535	0.0000	OK
120 minute summer	S6_1	64	29.682	0.032	3.9	0.0669	0.0000	OK
120 minute summer	S6_2	64	29.281	0.031	3.9	0.0356	0.0000	OK
120 minute summer	S6_3	64	28.196	0.040	3.9	0.0457	0.0000	OK
120 minute summer	S6	88	25.634	0.206	22.7	0.2514	0.0000	OK
120 minute summer	S7	88	25.634	0.259	22.4	0.2925	0.0000	OK
120 minute summer	ATTN	88	25.633	0.303	21.2	22.3281	0.0000	SURCHARGED
120 minute summer	S8_OUT	2	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	3.6	0.427	0.120	0.1615	
120 minute summer	S2	SP2	S3	5.5	0.537	0.183	0.1512	
120 minute summer	S3	SP3	S4	5.5	0.395	0.182	0.1690	
120 minute summer	S4_1	SP4_1	S4_2	3.1	0.928	0.041	0.0560	
120 minute summer	S4_2	SP4_2	S4	7.2	1.382	0.075	0.0505	
120 minute summer	S4	SP4	S5	12.6	0.614	0.422	0.6133	
120 minute summer	S5	SP5	S6	17.6	0.558	0.330	0.8109	
120 minute summer	S6_1	SP6_1	S6_2	3.9	0.978	0.024	0.0731	
120 minute summer	S6_2	SP6_2	S6_3	3.9	0.822	0.023	0.2302	
120 minute summer	S6_3	SP6_3	S6	3.9	0.698	0.038	0.0927	
120 minute summer	S6	SP6	S7	22.4	0.647	0.418	1.3076	
120 minute summer	S7	SP7	ATTN	21.2	0.678	0.398	1.2916	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				45.0

Results for 1 year +20% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	96	25.771	0.046	2.8	0.0940	0.0000	OK
180 minute summer	S2	96	25.720	0.059	4.3	0.0858	0.0000	OK
180 minute summer	S3	96	25.670	0.059	4.3	0.0668	0.0000	OK
180 minute summer	S4_1	96	29.053	0.028	2.4	0.0534	0.0000	OK
180 minute summer	S4_2	96	27.738	0.038	5.6	0.0649	0.0000	OK
180 minute summer	S4	96	25.658	0.088	9.9	0.0997	0.0000	OK
180 minute summer	S5	124	25.636	0.166	13.9	0.2559	0.0000	OK
180 minute summer	S6_1	96	29.679	0.029	3.0	0.0589	0.0000	OK
180 minute summer	S6_2	96	29.278	0.028	3.0	0.0315	0.0000	OK
180 minute summer	S6_3	96	28.192	0.036	3.0	0.0403	0.0000	OK
180 minute summer	S6	124	25.635	0.207	17.7	0.2533	0.0000	OK
180 minute summer	S7	124	25.635	0.260	17.2	0.2943	0.0000	OK
180 minute summer	ATTN	124	25.635	0.305	16.3	22.4468	0.0000	SURCHARGED
180 minute summer	S8_OUT	4	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	2.8	0.398	0.094	0.1351	
180 minute summer	S2	SP2	S3	4.3	0.520	0.143	0.1223	
180 minute summer	S3	SP3	S4	4.3	0.381	0.143	0.1380	
180 minute summer	S4_1	SP4_1	S4_2	2.4	0.861	0.032	0.0467	
180 minute summer	S4_2	SP4_2	S4	5.6	1.288	0.059	0.0421	
180 minute summer	S4	SP4	S5	9.9	0.577	0.331	0.6145	
180 minute summer	S5	SP5	S6	13.8	0.530	0.258	0.8191	
180 minute summer	S6_1	SP6_1	S6_2	3.0	0.905	0.018	0.0608	
180 minute summer	S6_2	SP6_2	S6_3	3.0	0.760	0.018	0.1916	
180 minute summer	S6_3	SP6_3	S6	3.0	0.647	0.029	0.0774	
180 minute summer	S6	SP6	S7	17.2	0.587	0.322	1.3162	
180 minute summer	S7	SP7	ATTN	16.3	0.619	0.305	1.2947	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				52.4

Results for 1 year +20% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	124	25.768	0.043	2.4	0.0869	0.0000	OK
240 minute summer	S2	124	25.716	0.055	3.7	0.0791	0.0000	OK
240 minute summer	S3	124	25.663	0.052	3.7	0.0593	0.0000	OK
240 minute summer	S4_1	124	29.051	0.026	2.1	0.0500	0.0000	OK
240 minute summer	S4_2	124	27.736	0.036	4.9	0.0605	0.0000	OK
240 minute summer	S4	124	25.651	0.081	8.5	0.0916	0.0000	OK
240 minute summer	S5	156	25.635	0.165	11.9	0.2545	0.0000	OK
240 minute summer	S6_1	124	29.677	0.027	2.7	0.0560	0.0000	OK
240 minute summer	S6_2	124	29.276	0.026	2.7	0.0298	0.0000	OK
240 minute summer	S6_3	124	28.189	0.033	2.7	0.0378	0.0000	OK
240 minute summer	S6	156	25.634	0.206	15.2	0.2520	0.0000	OK
240 minute summer	S7	156	25.634	0.259	14.8	0.2930	0.0000	OK
240 minute summer	ATTN	160	25.634	0.304	14.0	22.3654	0.0000	SURCHARGED
240 minute summer	S8_OUT	4	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	2.4	0.380	0.080	0.1206	
240 minute summer	S2	SP2	S3	3.7	0.507	0.122	0.1063	
240 minute summer	S3	SP3	S4	3.6	0.369	0.121	0.1208	
240 minute summer	S4_1	SP4_1	S4_2	2.1	0.826	0.028	0.0424	
240 minute summer	S4_2	SP4_2	S4	4.9	1.240	0.051	0.0381	
240 minute summer	S4	SP4	S5	8.4	0.558	0.283	0.6097	
240 minute summer	S5	SP5	S6	11.8	0.510	0.221	0.8140	
240 minute summer	S6_1	SP6_1	S6_2	2.7	0.879	0.016	0.0560	
240 minute summer	S6_2	SP6_2	S6_3	2.7	0.734	0.016	0.1747	
240 minute summer	S6_3	SP6_3	S6	2.6	0.622	0.025	0.0703	
240 minute summer	S6	SP6	S7	14.8	0.552	0.277	1.3105	
240 minute summer	S7	SP7	ATTN	14.0	0.564	0.263	1.2926	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				59.0

Results for 1 year +20% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	184	25.763	0.038	1.9	0.0775	0.0000	OK
360 minute summer	S2	184	25.709	0.048	2.9	0.0697	0.0000	OK
360 minute summer	S3	184	25.657	0.046	2.9	0.0525	0.0000	OK
360 minute summer	S4_1	184	29.049	0.024	1.7	0.0451	0.0000	OK
360 minute summer	S4_2	184	27.732	0.032	3.9	0.0538	0.0000	OK
360 minute summer	S4	184	25.641	0.071	6.7	0.0808	0.0000	OK
360 minute summer	S5	224	25.614	0.144	9.4	0.2226	0.0000	OK
360 minute summer	S6_1	184	29.674	0.024	2.1	0.0496	0.0000	OK
360 minute summer	S6_2	184	29.273	0.023	2.1	0.0264	0.0000	OK
360 minute summer	S6_3	184	28.186	0.030	2.1	0.0334	0.0000	OK
360 minute summer	S6	224	25.614	0.186	11.9	0.2267	0.0000	OK
360 minute summer	S7	224	25.613	0.238	11.6	0.2695	0.0000	OK
360 minute summer	ATTN	224	25.613	0.283	11.0	20.8105	0.0000	OK
360 minute summer	S8_OUT	8	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	1.9	0.357	0.063	0.1013	
360 minute summer	S2	SP2	S3	2.9	0.474	0.095	0.0890	
360 minute summer	S3	SP3	S4	2.8	0.344	0.095	0.1016	
360 minute summer	S4_1	SP4_1	S4_2	1.7	0.774	0.022	0.0364	
360 minute summer	S4_2	SP4_2	S4	3.9	1.160	0.040	0.0323	
360 minute summer	S4	SP4	S5	6.7	0.526	0.223	0.4903	
360 minute summer	S5	SP5	S6	9.3	0.482	0.174	0.7064	
360 minute summer	S6_1	SP6_1	S6_2	2.1	0.812	0.013	0.0471	
360 minute summer	S6_2	SP6_2	S6_3	2.1	0.686	0.012	0.1465	
360 minute summer	S6_3	SP6_3	S6	2.0	0.577	0.020	0.0588	
360 minute summer	S6	SP6	S7	11.6	0.510	0.217	1.1916	
360 minute summer	S7	SP7	ATTN	11.0	0.523	0.206	1.2332	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				69.2

Results for 1 year +20% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	248	25.760	0.035	1.6	0.0716	0.0000	OK
480 minute summer	S2	248	25.705	0.044	2.4	0.0637	0.0000	OK
480 minute summer	S3	248	25.654	0.043	2.4	0.0483	0.0000	OK
480 minute summer	S4_1	248	29.047	0.022	1.4	0.0412	0.0000	OK
480 minute summer	S4_2	248	27.729	0.029	3.2	0.0490	0.0000	OK
480 minute summer	S4	248	25.635	0.065	5.6	0.0739	0.0000	OK
480 minute summer	S5	288	25.594	0.124	7.9	0.1921	0.0000	OK
480 minute summer	S6_1	248	29.672	0.022	1.7	0.0450	0.0000	OK
480 minute summer	S6_2	248	29.271	0.021	1.7	0.0242	0.0000	OK
480 minute summer	S6_3	248	28.183	0.027	1.7	0.0307	0.0000	OK
480 minute summer	S6	288	25.594	0.166	10.0	0.2022	0.0000	OK
480 minute summer	S7	288	25.593	0.218	9.7	0.2466	0.0000	OK
480 minute summer	ATTN	288	25.593	0.263	9.3	19.2882	0.0000	OK
480 minute summer	S8_OUT	8	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	1.6	0.343	0.054	0.0895	
480 minute summer	S2	SP2	S3	2.4	0.450	0.080	0.0786	
480 minute summer	S3	SP3	S4	2.4	0.328	0.080	0.0899	
480 minute summer	S4_1	SP4_1	S4_2	1.4	0.734	0.019	0.0320	
480 minute summer	S4_2	SP4_2	S4	3.2	1.098	0.033	0.0282	
480 minute summer	S4	SP4	S5	5.6	0.502	0.187	0.4214	
480 minute summer	S5	SP5	S6	7.8	0.475	0.147	0.6013	
480 minute summer	S6_1	SP6_1	S6_2	1.7	0.761	0.010	0.0409	
480 minute summer	S6_2	SP6_2	S6_3	1.7	0.640	0.010	0.1285	
480 minute summer	S6_3	SP6_3	S6	1.7	0.548	0.016	0.0518	
480 minute summer	S6	SP6	S7	9.7	0.490	0.182	1.0667	
480 minute summer	S7	SP7	ATTN	9.3	0.492	0.175	1.1505	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				77.4

Results for 1 year +20% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	315	25.757	0.032	1.3	0.0647	0.0000	OK
600 minute summer	S2	315	25.701	0.040	2.0	0.0582	0.0000	OK
600 minute summer	S3	315	25.650	0.039	2.0	0.0442	0.0000	OK
600 minute summer	S4_1	315	29.044	0.019	1.1	0.0368	0.0000	OK
600 minute summer	S4_2	315	27.726	0.026	2.6	0.0443	0.0000	OK
600 minute summer	S4	315	25.629	0.059	4.6	0.0669	0.0000	OK
600 minute summer	S5	360	25.568	0.098	6.5	0.1507	0.0000	OK
600 minute summer	S6_1	315	29.671	0.021	1.5	0.0426	0.0000	OK
600 minute summer	S6_2	315	29.270	0.020	1.5	0.0229	0.0000	OK
600 minute summer	S6_3	315	28.182	0.026	1.5	0.0289	0.0000	OK
600 minute summer	S6	360	25.566	0.138	8.4	0.1689	0.0000	OK
600 minute summer	S7	360	25.565	0.190	8.2	0.2154	0.0000	OK
600 minute summer	ATTN	360	25.565	0.235	7.9	17.2277	0.0000	OK
600 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	1.3	0.319	0.044	0.0781	
600 minute summer	S2	SP2	S3	2.0	0.427	0.067	0.0690	
600 minute summer	S3	SP3	S4	2.0	0.313	0.067	0.0784	
600 minute summer	S4_1	SP4_1	S4_2	1.1	0.683	0.015	0.0270	
600 minute summer	S4_2	SP4_2	S4	2.6	1.033	0.027	0.0244	
600 minute summer	S4	SP4	S5	4.6	0.478	0.154	0.3317	
600 minute summer	S5	SP5	S6	6.5	0.461	0.121	0.4597	
600 minute summer	S6_1	SP6_1	S6_2	1.5	0.733	0.009	0.0375	
600 minute summer	S6_2	SP6_2	S6_3	1.5	0.615	0.009	0.1177	
600 minute summer	S6_3	SP6_3	S6	1.5	0.528	0.015	0.0475	
600 minute summer	S6	SP6	S7	8.2	0.473	0.153	0.8884	
600 minute summer	S7	SP7	ATTN	7.9	0.459	0.148	1.0180	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				83.3

Results for 1 year +20% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	375	25.756	0.031	1.2	0.0623	0.0000	OK
720 minute summer	S2	375	25.699	0.038	1.8	0.0552	0.0000	OK
720 minute summer	S3	375	25.648	0.037	1.8	0.0420	0.0000	OK
720 minute summer	S4_1	375	29.043	0.018	1.0	0.0351	0.0000	OK
720 minute summer	S4_2	375	27.725	0.025	2.4	0.0427	0.0000	OK
720 minute summer	S4	375	25.626	0.056	4.2	0.0639	0.0000	OK
720 minute summer	S5	420	25.549	0.079	6.0	0.1216	0.0000	OK
720 minute summer	S6_1	375	29.669	0.019	1.3	0.0398	0.0000	OK
720 minute summer	S6_2	375	29.269	0.019	1.3	0.0214	0.0000	OK
720 minute summer	S6_3	375	28.180	0.024	1.3	0.0270	0.0000	OK
720 minute summer	S6	420	25.546	0.118	7.7	0.1446	0.0000	OK
720 minute summer	S7	420	25.545	0.170	7.5	0.1925	0.0000	OK
720 minute summer	ATTN	420	25.545	0.215	7.3	15.7036	0.0000	OK
720 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	1.2	0.316	0.040	0.0729	
720 minute summer	S2	SP2	S3	1.8	0.414	0.060	0.0640	
720 minute summer	S3	SP3	S4	1.8	0.302	0.060	0.0733	
720 minute summer	S4_1	SP4_1	S4_2	1.0	0.663	0.013	0.0253	
720 minute summer	S4_2	SP4_2	S4	2.4	1.010	0.025	0.0230	
720 minute summer	S4	SP4	S5	4.2	0.468	0.141	0.2719	
720 minute summer	S5	SP5	S6	6.0	0.456	0.112	0.3616	
720 minute summer	S6_1	SP6_1	S6_2	1.3	0.702	0.008	0.0339	
720 minute summer	S6_2	SP6_2	S6_3	1.3	0.591	0.008	0.1066	
720 minute summer	S6_3	SP6_3	S6	1.3	0.505	0.013	0.0430	
720 minute summer	S6	SP6	S7	7.5	0.463	0.141	0.7554	
720 minute summer	S7	SP7	ATTN	7.3	0.459	0.137	0.9106	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				89.3

Results for 1 year +20% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	495	25.753	0.028	1.0	0.0571	0.0000	OK
960 minute summer	S2	495	25.696	0.035	1.5	0.0504	0.0000	OK
960 minute summer	S3	495	25.645	0.034	1.5	0.0384	0.0000	OK
960 minute summer	S4_1	495	29.042	0.017	0.9	0.0334	0.0000	OK
960 minute summer	S4_2	495	27.724	0.024	2.1	0.0399	0.0000	OK
960 minute summer	S4	495	25.622	0.052	3.6	0.0591	0.0000	OK
960 minute summer	S5	495	25.533	0.063	5.1	0.0976	0.0000	OK
960 minute summer	S6_1	495	29.668	0.018	1.1	0.0367	0.0000	OK
960 minute summer	S6_2	495	29.267	0.017	1.1	0.0197	0.0000	OK
960 minute summer	S6_3	495	28.178	0.022	1.1	0.0250	0.0000	OK
960 minute summer	S6	540	25.512	0.084	6.5	0.1020	0.0000	OK
960 minute summer	S7	540	25.508	0.133	6.4	0.1509	0.0000	OK
960 minute summer	ATTN	540	25.507	0.177	6.3	12.9275	0.0000	OK
960 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	1.0	0.299	0.033	0.0640	
960 minute summer	S2	SP2	S3	1.5	0.394	0.050	0.0562	
960 minute summer	S3	SP3	S4	1.5	0.284	0.050	0.0652	
960 minute summer	S4_1	SP4_1	S4_2	0.9	0.641	0.012	0.0235	
960 minute summer	S4_2	SP4_2	S4	2.1	0.971	0.022	0.0210	
960 minute summer	S4	SP4	S5	3.6	0.448	0.121	0.2402	
960 minute summer	S5	SP5	S6	5.1	0.439	0.096	0.2205	
960 minute summer	S6_1	SP6_1	S6_2	1.1	0.666	0.007	0.0302	
960 minute summer	S6_2	SP6_2	S6_3	1.1	0.566	0.007	0.0949	
960 minute summer	S6_3	SP6_3	S6	1.1	0.479	0.011	0.0383	
960 minute summer	S6	SP6	S7	6.4	0.451	0.121	0.5209	
960 minute summer	S7	SP7	ATTN	6.3	0.406	0.118	0.7047	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				98.9

Results for 1 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	750	25.750	0.025	0.8	0.0515	0.0000	OK
1440 minute summer	S2	750	25.692	0.031	1.2	0.0451	0.0000	OK
1440 minute summer	S3	750	25.642	0.031	1.2	0.0345	0.0000	OK
1440 minute summer	S4_1	750	29.041	0.016	0.7	0.0298	0.0000	OK
1440 minute summer	S4_2	750	27.721	0.021	1.6	0.0350	0.0000	OK
1440 minute summer	S4	750	25.616	0.046	2.8	0.0522	0.0000	OK
1440 minute summer	S5	750	25.525	0.055	3.9	0.0845	0.0000	OK
1440 minute summer	S6_1	750	29.666	0.016	0.9	0.0334	0.0000	OK
1440 minute summer	S6_2	750	29.266	0.016	0.9	0.0180	0.0000	OK
1440 minute summer	S6_3	750	28.176	0.020	0.9	0.0228	0.0000	OK
1440 minute summer	S6	750	25.490	0.062	5.1	0.0755	0.0000	OK
1440 minute summer	S7	780	25.460	0.085	5.1	0.0963	0.0000	OK
1440 minute summer	ATTN	780	25.457	0.127	5.1	9.1821	0.0000	OK
1440 minute summer	S8_OUT	30	25.271	0.000	4.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	0.8	0.280	0.027	0.0547	
1440 minute summer	S2	SP2	S3	1.2	0.369	0.040	0.0480	
1440 minute summer	S3	SP3	S4	1.2	0.268	0.040	0.0550	
1440 minute summer	S4_1	SP4_1	S4_2	0.7	0.594	0.009	0.0198	
1440 minute summer	S4_2	SP4_2	S4	1.6	0.898	0.017	0.0173	
1440 minute summer	S4	SP4	S5	2.8	0.423	0.094	0.1982	
1440 minute summer	S5	SP5	S6	3.9	0.407	0.073	0.1712	
1440 minute summer	S6_1	SP6_1	S6_2	0.9	0.628	0.005	0.0263	
1440 minute summer	S6_2	SP6_2	S6_3	0.9	0.527	0.005	0.0825	
1440 minute summer	S6_3	SP6_3	S6	0.9	0.451	0.009	0.0333	
1440 minute summer	S6	SP6	S7	5.1	0.438	0.095	0.2986	
1440 minute summer	S7	SP7	ATTN	5.1	0.346	0.095	0.4295	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.6				115.2

Results for 30 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	12	26.009	0.284	12.5	0.5791	0.0000	SURCHARGED
15 minute summer	S2	12	25.998	0.337	17.4	0.4891	0.0000	SURCHARGED
15 minute summer	S3	12	25.979	0.368	16.4	0.4166	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.084	0.059	10.8	0.1134	0.0000	OK
15 minute summer	S4_2	10	27.786	0.086	25.1	0.1451	0.0000	OK
15 minute summer	S4	12	25.963	0.393	36.6	0.4444	0.0000	SURCHARGED
15 minute summer	S5	12	25.782	0.312	52.5	0.4814	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.710	0.060	13.7	0.1245	0.0000	OK
15 minute summer	S6_2	10	29.307	0.057	13.6	0.0644	0.0000	OK
15 minute summer	S6_3	11	28.232	0.076	13.4	0.0859	0.0000	OK
15 minute summer	S6	12	25.732	0.304	68.1	0.3709	0.0000	SURCHARGED
15 minute summer	S7	19	25.674	0.299	67.4	0.3386	0.0000	OK
15 minute summer	ATTN	19	25.676	0.346	64.7	25.4853	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	11.1	0.549	0.372	0.7599	
15 minute summer	S2	SP2	S3	16.4	0.602	0.547	0.5864	
15 minute summer	S3	SP3	S4	18.8	0.484	0.627	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	10.7	1.317	0.142	0.1359	
15 minute summer	S4_2	SP4_2	S4	24.9	1.913	0.261	0.1264	
15 minute summer	S4	SP4	S5	37.0	0.931	1.240	1.1874	
15 minute summer	S5	SP5	S6	51.4	0.730	0.961	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	13.6	1.406	0.083	0.1774	
15 minute summer	S6_2	SP6_2	S6_3	13.4	1.199	0.080	0.5599	
15 minute summer	S6_3	SP6_3	S6	13.4	0.991	0.130	0.2261	
15 minute summer	S6	SP6	S7	67.4	1.016	1.260	1.5317	
15 minute summer	S7	SP7	ATTN	64.7	1.608	1.210	1.3470	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				34.0

Results for 30 year 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	25.998	0.273	11.8	0.5561	0.0000	SURCHARGED
30 minute summer	S2	20	25.989	0.328	16.1	0.4757	0.0000	SURCHARGED
30 minute summer	S3	20	25.972	0.361	14.7	0.4087	0.0000	SURCHARGED
30 minute summer	S4_1	18	29.083	0.058	10.2	0.1105	0.0000	OK
30 minute summer	S4_2	18	27.783	0.083	23.9	0.1414	0.0000	OK
30 minute summer	S4	20	25.957	0.387	35.2	0.4372	0.0000	SURCHARGED
30 minute summer	S5	20	25.803	0.333	50.0	0.5151	0.0000	SURCHARGED
30 minute summer	S6_1	18	29.709	0.059	13.0	0.1213	0.0000	OK
30 minute summer	S6_2	18	29.306	0.056	13.0	0.0634	0.0000	OK
30 minute summer	S6_3	18	28.230	0.074	13.0	0.0836	0.0000	OK
30 minute summer	S6	32	25.782	0.354	65.4	0.4328	0.0000	SURCHARGED
30 minute summer	S7	33	25.783	0.408	64.5	0.4614	0.0000	SURCHARGED
30 minute summer	ATTN	33	25.783	0.453	63.2	33.5282	0.0000	SURCHARGED
30 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	9.9	0.539	0.332	0.7599	
30 minute summer	S2	SP2	S3	14.7	0.579	0.490	0.5864	
30 minute summer	S3	SP3	S4	15.3	0.384	0.509	0.4837	
30 minute summer	S4_1	SP4_1	S4_2	10.2	1.302	0.135	0.1313	
30 minute summer	S4_2	SP4_2	S4	23.9	1.895	0.250	0.1223	
30 minute summer	S4	SP4	S5	34.4	0.866	1.153	1.1874	
30 minute summer	S5	SP5	S6	49.1	0.697	0.918	1.2557	
30 minute summer	S6_1	SP6_1	S6_2	13.0	1.386	0.079	0.1721	
30 minute summer	S6_2	SP6_2	S6_3	13.0	1.170	0.077	0.5429	
30 minute summer	S6_3	SP6_3	S6	12.8	0.980	0.124	0.2177	
30 minute summer	S6	SP6	S7	64.5	0.952	1.207	1.5861	
30 minute summer	S7	SP7	ATTN	63.2	1.197	1.183	1.3475	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				46.9

Results for 30 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	36	25.888	0.163	9.2	0.3319	0.0000	OK
60 minute summer	S2	36	25.886	0.225	13.9	0.3270	0.0000	SURCHARGED
60 minute summer	S3	36	25.879	0.268	11.8	0.3035	0.0000	SURCHARGED
60 minute summer	S4_1	33	29.076	0.051	7.9	0.0968	0.0000	OK
60 minute summer	S4_2	33	27.772	0.072	18.6	0.1226	0.0000	OK
60 minute summer	S4	60	25.876	0.306	28.2	0.3456	0.0000	SURCHARGED
60 minute summer	S5	60	25.874	0.404	40.2	0.6247	0.0000	SURCHARGED
60 minute summer	S6_1	33	29.702	0.052	10.1	0.1068	0.0000	OK
60 minute summer	S6_2	33	29.300	0.050	10.1	0.0561	0.0000	OK
60 minute summer	S6_3	34	28.221	0.065	10.1	0.0736	0.0000	OK
60 minute summer	S6	60	25.874	0.446	52.3	0.5445	0.0000	SURCHARGED
60 minute summer	S7	61	25.874	0.499	50.5	0.5639	0.0000	SURCHARGED
60 minute summer	ATTN	62	25.873	0.543	48.2	40.2604	0.0000	SURCHARGED
60 minute summer	S8_OUT	1	25.271	0.000	4.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	9.0	0.517	0.301	0.6737	
60 minute summer	S2	SP2	S3	11.8	0.563	0.393	0.5862	
60 minute summer	S3	SP3	S4	10.1	0.378	0.337	0.4837	
60 minute summer	S4_1	SP4_1	S4_2	7.9	1.214	0.105	0.1091	
60 minute summer	S4_2	SP4_2	S4	18.6	1.780	0.195	0.1013	
60 minute summer	S4	SP4	S5	26.8	0.682	0.899	1.1874	
60 minute summer	S5	SP5	S6	39.3	0.644	0.734	1.2557	
60 minute summer	S6_1	SP6_1	S6_2	10.1	1.289	0.061	0.1436	
60 minute summer	S6_2	SP6_2	S6_3	10.1	1.082	0.060	0.4532	
60 minute summer	S6_3	SP6_3	S6	10.0	0.915	0.097	0.1826	
60 minute summer	S6	SP6	S7	50.5	0.802	0.945	1.5861	
60 minute summer	S7	SP7	ATTN	48.2	0.950	0.901	1.3475	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.9				61.2

Results for 30 year 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	100	25.930	0.205	6.3	0.4187	0.0000	OK
120 minute summer	S2	100	25.930	0.269	9.6	0.3908	0.0000	SURCHARGED
120 minute summer	S3	100	25.930	0.319	9.2	0.3609	0.0000	SURCHARGED
120 minute summer	S4_1	64	29.067	0.042	5.4	0.0798	0.0000	OK
120 minute summer	S4_2	64	27.759	0.059	12.7	0.0994	0.0000	OK
120 minute summer	S4	100	25.930	0.360	21.1	0.4071	0.0000	SURCHARGED
120 minute summer	S5	100	25.929	0.459	29.1	0.7087	0.0000	SURCHARGED
120 minute summer	S6_1	64	29.693	0.043	6.9	0.0882	0.0000	OK
120 minute summer	S6_2	64	29.291	0.041	6.9	0.0467	0.0000	OK
120 minute summer	S6_3	64	28.210	0.054	6.9	0.0609	0.0000	OK
120 minute summer	S6	100	25.928	0.500	35.8	0.6110	0.0000	SURCHARGED
120 minute summer	S7	100	25.928	0.553	33.7	0.6251	0.0000	SURCHARGED
120 minute summer	ATTN	98	25.927	0.597	32.6	44.2738	0.0000	SURCHARGED
120 minute summer	S8_OUT	2	25.271	0.000	5.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	6.3	0.492	0.211	0.7435	
120 minute summer	S2	SP2	S3	9.2	0.549	0.307	0.5864	
120 minute summer	S3	SP3	S4	8.5	0.386	0.284	0.4837	
120 minute summer	S4_1	SP4_1	S4_2	5.4	1.089	0.072	0.0831	
120 minute summer	S4_2	SP4_2	S4	12.7	1.612	0.133	0.0764	
120 minute summer	S4	SP4	S5	20.0	0.639	0.668	1.1874	
120 minute summer	S5	SP5	S6	27.2	0.570	0.509	1.2557	
120 minute summer	S6_1	SP6_1	S6_2	6.9	1.156	0.042	0.1094	
120 minute summer	S6_2	SP6_2	S6_3	6.9	0.969	0.041	0.3464	
120 minute summer	S6_3	SP6_3	S6	6.9	0.823	0.067	0.1397	
120 minute summer	S6	SP6	S7	33.7	0.634	0.631	1.5861	
120 minute summer	S7	SP7	ATTN	32.6	0.816	0.610	1.3475	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.1				78.4

Results for 30 year 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	132	25.944	0.219	4.8	0.4458	0.0000	OK
180 minute summer	S2	132	25.944	0.283	7.3	0.4102	0.0000	SURCHARGED
180 minute summer	S3	132	25.944	0.333	7.1	0.3762	0.0000	SURCHARGED
180 minute summer	S4_1	96	29.061	0.036	4.1	0.0695	0.0000	OK
180 minute summer	S4_2	96	27.751	0.051	9.7	0.0862	0.0000	OK
180 minute summer	S4	132	25.944	0.374	16.2	0.4225	0.0000	SURCHARGED
180 minute summer	S5	132	25.943	0.473	22.4	0.7301	0.0000	SURCHARGED
180 minute summer	S6_1	96	29.688	0.038	5.3	0.0775	0.0000	OK
180 minute summer	S6_2	96	29.286	0.036	5.3	0.0412	0.0000	OK
180 minute summer	S6_3	96	28.203	0.047	5.3	0.0534	0.0000	OK
180 minute summer	S6	132	25.942	0.514	27.4	0.6280	0.0000	SURCHARGED
180 minute summer	S7	132	25.942	0.567	25.8	0.6409	0.0000	SURCHARGED
180 minute summer	ATTN	132	25.941	0.611	25.1	45.3237	0.0000	SURCHARGED
180 minute summer	S8_OUT	4	25.271	0.000	5.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	4.8	0.463	0.161	0.7567	
180 minute summer	S2	SP2	S3	7.1	0.543	0.236	0.5864	
180 minute summer	S3	SP3	S4	6.7	0.392	0.222	0.4837	
180 minute summer	S4_1	SP4_1	S4_2	4.1	1.007	0.054	0.0682	
180 minute summer	S4_2	SP4_2	S4	9.7	1.501	0.101	0.0627	
180 minute summer	S4	SP4	S5	15.4	0.596	0.515	1.1874	
180 minute summer	S5	SP5	S6	20.8	0.533	0.389	1.2557	
180 minute summer	S6_1	SP6_1	S6_2	5.3	1.070	0.032	0.0908	
180 minute summer	S6_2	SP6_2	S6_3	5.3	0.897	0.032	0.2871	
180 minute summer	S6_3	SP6_3	S6	5.3	0.765	0.051	0.1158	
180 minute summer	S6	SP6	S7	25.8	0.566	0.483	1.5861	
180 minute summer	S7	SP7	ATTN	25.1	0.727	0.470	1.3475	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.2				90.2

Results for 30 year 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	168	25.945	0.220	4.1	0.4487	0.0000	OK
240 minute summer	S2	168	25.945	0.284	6.3	0.4123	0.0000	SURCHARGED
240 minute summer	S3	168	25.945	0.334	6.3	0.3778	0.0000	SURCHARGED
240 minute summer	S4_1	124	29.059	0.034	3.6	0.0649	0.0000	OK
240 minute summer	S4_2	124	27.747	0.047	8.4	0.0796	0.0000	OK
240 minute summer	S4	168	25.945	0.375	13.7	0.4241	0.0000	SURCHARGED
240 minute summer	S5	168	25.944	0.474	18.8	0.7325	0.0000	SURCHARGED
240 minute summer	S6_1	124	29.685	0.035	4.5	0.0716	0.0000	OK
240 minute summer	S6_2	124	29.284	0.034	4.5	0.0380	0.0000	OK
240 minute summer	S6_3	124	28.199	0.043	4.5	0.0487	0.0000	OK
240 minute summer	S6	168	25.944	0.516	22.9	0.6298	0.0000	SURCHARGED
240 minute summer	S7	168	25.943	0.568	21.6	0.6427	0.0000	SURCHARGED
240 minute summer	ATTN	168	25.943	0.613	21.2	45.4373	0.0000	SURCHARGED
240 minute summer	S8_OUT	4	25.271	0.000	5.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	4.1	0.450	0.137	0.7576	
240 minute summer	S2	SP2	S3	6.3	0.540	0.209	0.5864	
240 minute summer	S3	SP3	S4	5.6	0.392	0.188	0.4837	
240 minute summer	S4_1	SP4_1	S4_2	3.6	0.968	0.047	0.0619	
240 minute summer	S4_2	SP4_2	S4	8.3	1.440	0.087	0.0562	
240 minute summer	S4	SP4	S5	13.2	0.571	0.441	1.1874	
240 minute summer	S5	SP5	S6	17.4	0.514	0.325	1.2557	
240 minute summer	S6_1	SP6_1	S6_2	4.5	1.019	0.027	0.0806	
240 minute summer	S6_2	SP6_2	S6_3	4.5	0.854	0.027	0.2523	
240 minute summer	S6_3	SP6_3	S6	4.4	0.724	0.043	0.1014	
240 minute summer	S6	SP6	S7	21.6	0.534	0.405	1.5861	
240 minute summer	S7	SP7	ATTN	21.2	0.679	0.397	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.2				99.8

Results for 30 year 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	240	25.928	0.203	3.2	0.4141	0.0000	OK
360 minute summer	S2	240	25.928	0.267	4.9	0.3876	0.0000	SURCHARGED
360 minute summer	S3	240	25.928	0.317	4.9	0.3586	0.0000	SURCHARGED
360 minute summer	S4_1	184	29.055	0.030	2.8	0.0574	0.0000	OK
360 minute summer	S4_2	184	27.741	0.041	6.5	0.0698	0.0000	OK
360 minute summer	S4	240	25.928	0.358	10.8	0.4049	0.0000	SURCHARGED
360 minute summer	S5	240	25.927	0.457	14.5	0.7060	0.0000	SURCHARGED
360 minute summer	S6_1	184	29.681	0.031	3.5	0.0634	0.0000	OK
360 minute summer	S6_2	184	29.280	0.030	3.5	0.0337	0.0000	OK
360 minute summer	S6_3	184	28.194	0.038	3.5	0.0430	0.0000	OK
360 minute summer	S6	240	25.927	0.499	18.0	0.6089	0.0000	SURCHARGED
360 minute summer	S7	240	25.926	0.551	17.0	0.6234	0.0000	SURCHARGED
360 minute summer	ATTN	240	25.926	0.596	16.6	44.1639	0.0000	SURCHARGED
360 minute summer	S8_OUT	8	25.271	0.000	5.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	3.2	0.424	0.106	0.7407	
360 minute summer	S2	SP2	S3	4.9	0.519	0.163	0.5864	
360 minute summer	S3	SP3	S4	4.3	0.378	0.144	0.4837	
360 minute summer	S4_1	SP4_1	S4_2	2.8	0.900	0.037	0.0518	
360 minute summer	S4_2	SP4_2	S4	6.5	1.340	0.068	0.0467	
360 minute summer	S4	SP4	S5	9.8	0.540	0.330	1.1874	
360 minute summer	S5	SP5	S6	13.5	0.491	0.252	1.2557	
360 minute summer	S6_1	SP6_1	S6_2	3.5	0.946	0.021	0.0675	
360 minute summer	S6_2	SP6_2	S6_3	3.5	0.795	0.021	0.2112	
360 minute summer	S6_3	SP6_3	S6	3.4	0.673	0.033	0.0850	
360 minute summer	S6	SP6	S7	17.0	0.506	0.318	1.5861	
360 minute summer	S7	SP7	ATTN	16.6	0.564	0.310	1.3475	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.1				114.2

Results for 30 year 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	304	25.899	0.174	2.6	0.3542	0.0000	OK
480 minute summer	S2	304	25.899	0.238	4.0	0.3450	0.0000	SURCHARGED
480 minute summer	S3	304	25.899	0.288	4.0	0.3254	0.0000	SURCHARGED
480 minute summer	S4_1	248	29.052	0.027	2.2	0.0512	0.0000	OK
480 minute summer	S4_2	248	27.737	0.037	5.2	0.0625	0.0000	OK
480 minute summer	S4	304	25.899	0.329	9.1	0.3717	0.0000	SURCHARGED
480 minute summer	S5	304	25.898	0.428	12.8	0.6606	0.0000	SURCHARGED
480 minute summer	S6_1	248	29.678	0.028	2.8	0.0570	0.0000	OK
480 minute summer	S6_2	248	29.277	0.027	2.8	0.0305	0.0000	OK
480 minute summer	S6_3	248	28.191	0.035	2.8	0.0391	0.0000	OK
480 minute summer	S6	304	25.897	0.469	15.5	0.5730	0.0000	SURCHARGED
480 minute summer	S7	304	25.897	0.522	14.7	0.5900	0.0000	SURCHARGED
480 minute summer	ATTN	304	25.896	0.566	14.0	41.9576	0.0000	SURCHARGED
480 minute summer	S8_OUT	8	25.271	0.000	5.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	2.6	0.401	0.087	0.6944	
480 minute summer	S2	SP2	S3	4.0	0.514	0.133	0.5864	
480 minute summer	S3	SP3	S4	3.9	0.374	0.130	0.4837	
480 minute summer	S4_1	SP4_1	S4_2	2.2	0.839	0.029	0.0440	
480 minute summer	S4_2	SP4_2	S4	5.2	1.262	0.054	0.0399	
480 minute summer	S4	SP4	S5	9.0	0.520	0.300	1.1874	
480 minute summer	S5	SP5	S6	11.9	0.476	0.222	1.2557	
480 minute summer	S6_1	SP6_1	S6_2	2.8	0.887	0.017	0.0578	
480 minute summer	S6_2	SP6_2	S6_3	2.8	0.742	0.017	0.1825	
480 minute summer	S6_3	SP6_3	S6	2.8	0.634	0.027	0.0738	
480 minute summer	S6	SP6	S7	14.7	0.488	0.275	1.5861	
480 minute summer	S7	SP7	ATTN	14.0	0.543	0.261	1.3475	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.0				125.7

Results for 30 year 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	375	25.872	0.147	2.1	0.2995	0.0000	OK
600 minute summer	S2	375	25.872	0.211	3.2	0.3060	0.0000	OK
600 minute summer	S3	375	25.872	0.261	3.2	0.2950	0.0000	SURCHARGED
600 minute summer	S4_1	315	29.050	0.025	1.9	0.0478	0.0000	OK
600 minute summer	S4_2	315	27.734	0.034	4.4	0.0574	0.0000	OK
600 minute summer	S4	375	25.872	0.302	7.5	0.3413	0.0000	SURCHARGED
600 minute summer	S5	375	25.871	0.401	10.6	0.6191	0.0000	SURCHARGED
600 minute summer	S6_1	315	29.676	0.026	2.4	0.0530	0.0000	OK
600 minute summer	S6_2	315	29.275	0.025	2.4	0.0283	0.0000	OK
600 minute summer	S6_3	315	28.188	0.032	2.4	0.0363	0.0000	OK
600 minute summer	S6	375	25.870	0.442	13.0	0.5402	0.0000	SURCHARGED
600 minute summer	S7	375	25.870	0.495	12.3	0.5596	0.0000	SURCHARGED
600 minute summer	ATTN	375	25.869	0.539	11.7	39.9514	0.0000	SURCHARGED
600 minute summer	S8_OUT	15	25.271	0.000	4.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	2.1	0.378	0.070	0.6321	
600 minute summer	S2	SP2	S3	3.2	0.488	0.106	0.5785	
600 minute summer	S3	SP3	S4	3.1	0.351	0.105	0.4837	
600 minute summer	S4_1	SP4_1	S4_2	1.9	0.803	0.025	0.0397	
600 minute summer	S4_2	SP4_2	S4	4.4	1.204	0.046	0.0354	
600 minute summer	S4	SP4	S5	7.5	0.500	0.250	1.1874	
600 minute summer	S5	SP5	S6	9.9	0.466	0.186	1.2557	
600 minute summer	S6_1	SP6_1	S6_2	2.4	0.847	0.015	0.0519	
600 minute summer	S6_2	SP6_2	S6_3	2.4	0.710	0.014	0.1637	
600 minute summer	S6_3	SP6_3	S6	2.4	0.606	0.023	0.0662	
600 minute summer	S6	SP6	S7	12.3	0.479	0.230	1.5861	
600 minute summer	S7	SP7	ATTN	11.7	0.541	0.219	1.3475	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.9				135.1

Results for 30 year 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	450	25.839	0.114	1.9	0.2319	0.0000	OK
720 minute summer	S2	450	25.839	0.178	2.9	0.2579	0.0000	OK
720 minute summer	S3	450	25.839	0.228	2.9	0.2575	0.0000	SURCHARGED
720 minute summer	S4_1	375	29.049	0.024	1.7	0.0453	0.0000	OK
720 minute summer	S4_2	375	27.732	0.032	3.9	0.0540	0.0000	OK
720 minute summer	S4	450	25.839	0.269	6.7	0.3038	0.0000	SURCHARGED
720 minute summer	S5	450	25.838	0.368	9.5	0.5682	0.0000	SURCHARGED
720 minute summer	S6_1	375	29.674	0.024	2.1	0.0497	0.0000	OK
720 minute summer	S6_2	375	29.274	0.024	2.1	0.0266	0.0000	OK
720 minute summer	S6_3	375	28.186	0.030	2.1	0.0340	0.0000	OK
720 minute summer	S6	450	25.838	0.410	11.6	0.5001	0.0000	SURCHARGED
720 minute summer	S7	450	25.837	0.462	11.1	0.5226	0.0000	SURCHARGED
720 minute summer	ATTN	450	25.837	0.507	10.6	37.5170	0.0000	SURCHARGED
720 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	1.9	0.366	0.064	0.5137	
720 minute summer	S2	SP2	S3	2.9	0.474	0.096	0.5412	
720 minute summer	S3	SP3	S4	2.9	0.344	0.095	0.4836	
720 minute summer	S4_1	SP4_1	S4_2	1.7	0.777	0.023	0.0367	
720 minute summer	S4_2	SP4_2	S4	3.9	1.163	0.041	0.0325	
720 minute summer	S4	SP4	S5	6.7	0.492	0.224	1.1874	
720 minute summer	S5	SP5	S6	9.0	0.460	0.168	1.2557	
720 minute summer	S6_1	SP6_1	S6_2	2.1	0.812	0.013	0.0474	
720 minute summer	S6_2	SP6_2	S6_3	2.1	0.685	0.013	0.1492	
720 minute summer	S6_3	SP6_3	S6	2.1	0.583	0.020	0.0602	
720 minute summer	S6	SP6	S7	11.1	0.469	0.208	1.5861	
720 minute summer	S7	SP7	ATTN	10.6	0.543	0.198	1.3475	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				144.0

Results for 30 year 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	585	25.792	0.067	1.6	0.1356	0.0000	OK
960 minute summer	S2	585	25.791	0.130	2.5	0.1893	0.0000	OK
960 minute summer	S3	585	25.791	0.180	2.5	0.2040	0.0000	OK
960 minute summer	S4_1	495	29.047	0.022	1.4	0.0412	0.0000	OK
960 minute summer	S4_2	495	27.729	0.029	3.3	0.0498	0.0000	OK
960 minute summer	S4	585	25.791	0.221	5.8	0.2503	0.0000	OK
960 minute summer	S5	585	25.791	0.320	8.1	0.4952	0.0000	SURCHARGED
960 minute summer	S6_1	495	29.672	0.022	1.8	0.0462	0.0000	OK
960 minute summer	S6_2	495	29.272	0.022	1.8	0.0248	0.0000	OK
960 minute summer	S6_3	495	28.184	0.028	1.8	0.0315	0.0000	OK
960 minute summer	S6	585	25.790	0.362	10.0	0.4423	0.0000	SURCHARGED
960 minute summer	S7	585	25.790	0.415	9.6	0.4691	0.0000	SURCHARGED
960 minute summer	ATTN	585	25.789	0.459	9.2	33.9856	0.0000	SURCHARGED
960 minute summer	S8_OUT	15	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	1.6	0.337	0.054	0.3215	
960 minute summer	S2	SP2	S3	2.5	0.456	0.083	0.4274	
960 minute summer	S3	SP3	S4	2.5	0.332	0.083	0.4482	
960 minute summer	S4_1	SP4_1	S4_2	1.4	0.734	0.019	0.0320	
960 minute summer	S4_2	SP4_2	S4	3.3	1.108	0.035	0.0289	
960 minute summer	S4	SP4	S5	5.7	0.474	0.192	1.1849	
960 minute summer	S5	SP5	S6	7.7	0.443	0.145	1.2557	
960 minute summer	S6_1	SP6_1	S6_2	1.8	0.774	0.011	0.0426	
960 minute summer	S6_2	SP6_2	S6_3	1.8	0.652	0.011	0.1338	
960 minute summer	S6_3	SP6_3	S6	1.8	0.557	0.017	0.0540	
960 minute summer	S6	SP6	S7	9.6	0.455	0.179	1.5861	
960 minute summer	S7	SP7	ATTN	9.2	0.496	0.172	1.3475	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				159.6

Results for 30 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	750	25.756	0.031	1.2	0.0623	0.0000	OK
1440 minute summer	S2	750	25.699	0.038	1.8	0.0552	0.0000	OK
1440 minute summer	S3	840	25.662	0.051	1.8	0.0578	0.0000	OK
1440 minute summer	S4_1	750	29.043	0.018	1.0	0.0351	0.0000	OK
1440 minute summer	S4_2	750	27.725	0.025	2.4	0.0427	0.0000	OK
1440 minute summer	S4	840	25.662	0.092	4.2	0.1035	0.0000	OK
1440 minute summer	S5	840	25.661	0.191	6.0	0.2947	0.0000	OK
1440 minute summer	S6_1	750	29.669	0.019	1.3	0.0398	0.0000	OK
1440 minute summer	S6_2	750	29.269	0.019	1.3	0.0214	0.0000	OK
1440 minute summer	S6_3	750	28.180	0.024	1.3	0.0270	0.0000	OK
1440 minute summer	S6	840	25.660	0.232	7.6	0.2839	0.0000	OK
1440 minute summer	S7	840	25.660	0.285	7.4	0.3225	0.0000	OK
1440 minute summer	ATTN	840	25.660	0.330	7.1	24.2996	0.0000	SURCHARGED
1440 minute summer	S8_OUT	30	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	1.2	0.316	0.040	0.0729	
1440 minute summer	S2	SP2	S3	1.8	0.414	0.060	0.0722	
1440 minute summer	S3	SP3	S4	1.8	0.302	0.060	0.1333	
1440 minute summer	S4_1	SP4_1	S4_2	1.0	0.663	0.013	0.0253	
1440 minute summer	S4_2	SP4_2	S4	2.4	1.010	0.025	0.0230	
1440 minute summer	S4	SP4	S5	4.2	0.458	0.141	0.7621	
1440 minute summer	S5	SP5	S6	5.9	0.439	0.110	0.9436	
1440 minute summer	S6_1	SP6_1	S6_2	1.3	0.702	0.008	0.0339	
1440 minute summer	S6_2	SP6_2	S6_3	1.3	0.591	0.008	0.1066	
1440 minute summer	S6_3	SP6_3	S6	1.3	0.505	0.013	0.0430	
1440 minute summer	S6	SP6	S7	7.4	0.442	0.138	1.4385	
1440 minute summer	S7	SP7	ATTN	7.1	0.368	0.134	1.3354	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				178.3

Results for 30 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	12	26.211	0.486	15.0	0.9914	0.0000	SURCHARGED
15 minute summer	S2	12	26.199	0.538	20.6	0.7810	0.0000	SURCHARGED
15 minute summer	S3	12	26.176	0.565	19.0	0.6391	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.090	0.065	12.9	0.1247	0.0000	OK
15 minute summer	S4_2	10	27.795	0.095	30.0	0.1615	0.0000	OK
15 minute summer	S4	12	26.155	0.585	43.5	0.6617	0.0000	SURCHARGED
15 minute summer	S5	12	25.917	0.447	62.2	0.6910	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.716	0.066	16.4	0.1366	0.0000	OK
15 minute summer	S6_2	10	29.312	0.062	16.3	0.0704	0.0000	OK
15 minute summer	S6_3	11	28.240	0.084	16.1	0.0946	0.0000	OK
15 minute summer	S6	12	25.846	0.418	81.7	0.5098	0.0000	SURCHARGED
15 minute summer	S7	19	25.744	0.369	80.8	0.4176	0.0000	SURCHARGED
15 minute summer	ATTN	19	25.747	0.417	78.6	30.7878	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	13.1	0.557	0.437	0.7599	
15 minute summer	S2	SP2	S3	19.0	0.592	0.632	0.5864	
15 minute summer	S3	SP3	S4	21.5	0.540	0.716	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	12.8	1.382	0.169	0.1547	
15 minute summer	S4_2	SP4_2	S4	29.9	1.998	0.313	0.1450	
15 minute summer	S4	SP4	S5	42.5	1.068	1.422	1.1874	
15 minute summer	S5	SP5	S6	60.8	0.863	1.136	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	16.3	1.478	0.099	0.2020	
15 minute summer	S6_2	SP6_2	S6_3	16.1	1.254	0.096	0.6389	
15 minute summer	S6_3	SP6_3	S6	16.1	1.041	0.156	0.2582	
15 minute summer	S6	SP6	S7	80.8	1.148	1.511	1.5861	
15 minute summer	S7	SP7	ATTN	78.6	1.651	1.470	1.3475	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				40.7

Results for 30 year +20% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.226	0.501	14.2	1.0207	0.0000	SURCHARGED
30 minute summer	S2	20	26.214	0.553	18.7	0.8028	0.0000	SURCHARGED
30 minute summer	S3	20	26.192	0.581	17.2	0.6569	0.0000	SURCHARGED
30 minute summer	S4_1	18	29.089	0.064	12.2	0.1215	0.0000	OK
30 minute summer	S4_2	18	27.793	0.093	28.6	0.1571	0.0000	OK
30 minute summer	S4	20	26.171	0.601	41.6	0.6796	0.0000	SURCHARGED
30 minute summer	S5	20	25.961	0.491	59.3	0.7584	0.0000	SURCHARGED
30 minute summer	S6_1	18	29.715	0.065	15.6	0.1332	0.0000	OK
30 minute summer	S6_2	18	29.311	0.061	15.6	0.0693	0.0000	OK
30 minute summer	S6_3	18	28.238	0.082	15.6	0.0923	0.0000	OK
30 minute summer	S6	20	25.901	0.473	77.3	0.5780	0.0000	SURCHARGED
30 minute summer	S7	33	25.882	0.507	76.2	0.5732	0.0000	SURCHARGED
30 minute summer	ATTN	33	25.882	0.552	75.3	40.9153	0.0000	SURCHARGED
30 minute summer	S8_OUT	1	25.271	0.000	4.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	11.9	0.541	0.397	0.7599	
30 minute summer	S2	SP2	S3	17.2	0.578	0.573	0.5864	
30 minute summer	S3	SP3	S4	18.7	0.470	0.623	0.4837	
30 minute summer	S4_1	SP4_1	S4_2	12.2	1.367	0.162	0.1496	
30 minute summer	S4_2	SP4_2	S4	28.6	1.979	0.299	0.1401	
30 minute summer	S4	SP4	S5	40.6	1.020	1.358	1.1874	
30 minute summer	S5	SP5	S6	57.7	0.820	1.080	1.2557	
30 minute summer	S6_1	SP6_1	S6_2	15.6	1.458	0.095	0.1962	
30 minute summer	S6_2	SP6_2	S6_3	15.6	1.228	0.093	0.6212	
30 minute summer	S6_3	SP6_3	S6	15.3	1.030	0.149	0.2491	
30 minute summer	S6	SP6	S7	76.2	1.083	1.426	1.5861	
30 minute summer	S7	SP7	ATTN	75.3	1.196	1.410	1.3475	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.9				55.9

Results for 30 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	36	26.100	0.375	11.1	0.7633	0.0000	SURCHARGED
60 minute summer	S2	36	26.093	0.432	15.3	0.6269	0.0000	SURCHARGED
60 minute summer	S3	36	26.080	0.469	13.3	0.5308	0.0000	SURCHARGED
60 minute summer	S4_1	33	29.081	0.056	9.5	0.1065	0.0000	OK
60 minute summer	S4_2	33	27.780	0.080	22.3	0.1358	0.0000	OK
60 minute summer	S4	36	26.069	0.499	32.4	0.5640	0.0000	SURCHARGED
60 minute summer	S5	60	26.007	0.537	46.5	0.8303	0.0000	SURCHARGED
60 minute summer	S6_1	33	29.707	0.057	12.1	0.1170	0.0000	OK
60 minute summer	S6_2	33	29.304	0.054	12.1	0.0613	0.0000	OK
60 minute summer	S6_3	33	28.228	0.072	12.1	0.0809	0.0000	OK
60 minute summer	S6	61	26.007	0.579	60.8	0.7071	0.0000	SURCHARGED
60 minute summer	S7	61	26.007	0.632	59.8	0.7142	0.0000	SURCHARGED
60 minute summer	ATTN	62	26.006	0.676	58.9	50.1999	0.0000	SURCHARGED
60 minute summer	S8_OUT	1	25.271	0.000	5.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	9.7	0.520	0.326	0.7599	
60 minute summer	S2	SP2	S3	13.3	0.562	0.443	0.5864	
60 minute summer	S3	SP3	S4	13.6	0.377	0.452	0.4837	
60 minute summer	S4_1	SP4_1	S4_2	9.5	1.277	0.126	0.1247	
60 minute summer	S4_2	SP4_2	S4	22.3	1.862	0.233	0.1161	
60 minute summer	S4	SP4	S5	32.0	0.806	1.073	1.1874	
60 minute summer	S5	SP5	S6	45.3	0.646	0.847	1.2557	
60 minute summer	S6_1	SP6_1	S6_2	12.1	1.357	0.074	0.1635	
60 minute summer	S6_2	SP6_2	S6_3	12.1	1.136	0.072	0.5174	
60 minute summer	S6_3	SP6_3	S6	12.0	0.962	0.116	0.2081	
60 minute summer	S6	SP6	S7	59.8	0.849	1.118	1.5861	
60 minute summer	S7	SP7	ATTN	58.9	1.003	1.102	1.3475	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.4				72.6

Results for 30 year +20% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	102	26.083	0.358	7.5	0.7291	0.0000	SURCHARGED
120 minute summer	S2	102	26.083	0.422	11.2	0.6118	0.0000	SURCHARGED
120 minute summer	S3	104	26.082	0.471	9.8	0.5333	0.0000	SURCHARGED
120 minute summer	S4_1	64	29.071	0.046	6.5	0.0876	0.0000	OK
120 minute summer	S4_2	64	27.765	0.065	15.2	0.1096	0.0000	OK
120 minute summer	S4	104	26.082	0.512	22.7	0.5795	0.0000	SURCHARGED
120 minute summer	S5	104	26.081	0.611	32.3	0.9441	0.0000	SURCHARGED
120 minute summer	S6_1	64	29.697	0.047	8.3	0.0967	0.0000	OK
120 minute summer	S6_2	64	29.295	0.045	8.3	0.0510	0.0000	OK
120 minute summer	S6_3	64	28.215	0.059	8.3	0.0669	0.0000	OK
120 minute summer	S6	104	26.081	0.653	41.9	0.7970	0.0000	SURCHARGED
120 minute summer	S7	104	26.080	0.705	41.4	0.7973	0.0000	SURCHARGED
120 minute summer	ATTN	104	26.079	0.749	40.8	55.6434	0.0000	SURCHARGED
120 minute summer	S8_OUT	2	25.271	0.000	5.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	7.2	0.501	0.242	0.7599	
120 minute summer	S2	SP2	S3	9.8	0.551	0.326	0.5864	
120 minute summer	S3	SP3	S4	8.6	0.388	0.288	0.4837	
120 minute summer	S4_1	SP4_1	S4_2	6.5	1.149	0.086	0.0948	
120 minute summer	S4_2	SP4_2	S4	15.2	1.690	0.159	0.0872	
120 minute summer	S4	SP4	S5	22.3	0.639	0.747	1.1874	
120 minute summer	S5	SP5	S6	31.6	0.566	0.592	1.2557	
120 minute summer	S6_1	SP6_1	S6_2	8.3	1.221	0.050	0.1247	
120 minute summer	S6_2	SP6_2	S6_3	8.3	1.020	0.049	0.3953	
120 minute summer	S6_3	SP6_3	S6	8.3	0.867	0.080	0.1595	
120 minute summer	S6	SP6	S7	41.4	0.614	0.774	1.5861	
120 minute summer	S7	SP7	ATTN	40.8	0.855	0.764	1.3475	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.7				92.4

Results for 30 year +20% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	136	26.103	0.378	5.8	0.7713	0.0000	SURCHARGED
180 minute summer	S2	136	26.103	0.442	8.8	0.6419	0.0000	SURCHARGED
180 minute summer	S3	136	26.103	0.492	7.2	0.5568	0.0000	SURCHARGED
180 minute summer	S4_1	96	29.065	0.040	5.0	0.0768	0.0000	OK
180 minute summer	S4_2	96	27.756	0.056	11.7	0.0952	0.0000	OK
180 minute summer	S4	136	26.103	0.533	16.9	0.6030	0.0000	SURCHARGED
180 minute summer	S5	136	26.102	0.632	24.7	0.9763	0.0000	SURCHARGED
180 minute summer	S6_1	96	29.691	0.041	6.3	0.0844	0.0000	OK
180 minute summer	S6_2	96	29.290	0.040	6.3	0.0447	0.0000	OK
180 minute summer	S6_3	96	28.208	0.052	6.3	0.0582	0.0000	OK
180 minute summer	S6	136	26.102	0.674	32.1	0.8224	0.0000	SURCHARGED
180 minute summer	S7	136	26.101	0.726	31.6	0.8209	0.0000	SURCHARGED
180 minute summer	ATTN	136	26.100	0.770	31.1	57.1958	0.0000	SURCHARGED
180 minute summer	S8_OUT	4	25.271	0.000	5.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	5.7	0.464	0.191	0.7599	
180 minute summer	S2	SP2	S3	7.2	0.547	0.241	0.5864	
180 minute summer	S3	SP3	S4	6.8	0.392	0.227	0.4837	
180 minute summer	S4_1	SP4_1	S4_2	5.0	1.066	0.066	0.0787	
180 minute summer	S4_2	SP4_2	S4	11.7	1.578	0.122	0.0719	
180 minute summer	S4	SP4	S5	16.3	0.594	0.545	1.1874	
180 minute summer	S5	SP5	S6	23.9	0.528	0.447	1.2557	
180 minute summer	S6_1	SP6_1	S6_2	6.3	1.127	0.038	0.1025	
180 minute summer	S6_2	SP6_2	S6_3	6.3	0.942	0.038	0.3248	
180 minute summer	S6_3	SP6_3	S6	6.3	0.803	0.061	0.1311	
180 minute summer	S6	SP6	S7	31.6	0.547	0.591	1.5861	
180 minute summer	S7	SP7	ATTN	31.1	0.754	0.583	1.3475	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.7				106.6

Results for 30 year +20% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	172	26.110	0.385	5.0	0.7847	0.0000	SURCHARGED
240 minute summer	S2	172	26.110	0.449	7.0	0.6515	0.0000	SURCHARGED
240 minute summer	S3	172	26.110	0.499	6.5	0.5642	0.0000	SURCHARGED
240 minute summer	S4_1	124	29.062	0.037	4.3	0.0710	0.0000	OK
240 minute summer	S4_2	124	27.752	0.052	10.0	0.0874	0.0000	OK
240 minute summer	S4	172	26.110	0.540	14.7	0.6105	0.0000	SURCHARGED
240 minute summer	S5	172	26.109	0.639	20.8	0.9866	0.0000	SURCHARGED
240 minute summer	S6_1	124	29.688	0.038	5.5	0.0789	0.0000	OK
240 minute summer	S6_2	124	29.287	0.037	5.5	0.0417	0.0000	OK
240 minute summer	S6_3	124	28.204	0.048	5.4	0.0538	0.0000	OK
240 minute summer	S6	172	26.108	0.680	27.1	0.8305	0.0000	SURCHARGED
240 minute summer	S7	172	26.107	0.732	26.8	0.8284	0.0000	SURCHARGED
240 minute summer	ATTN	172	26.107	0.777	26.4	57.6978	0.0000	SURCHARGED
240 minute summer	S8_OUT	4	25.271	0.000	5.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	4.5	0.454	0.152	0.7599	
240 minute summer	S2	SP2	S3	6.5	0.539	0.216	0.5864	
240 minute summer	S3	SP3	S4	5.7	0.384	0.190	0.4837	
240 minute summer	S4_1	SP4_1	S4_2	4.3	1.019	0.057	0.0703	
240 minute summer	S4_2	SP4_2	S4	10.0	1.511	0.104	0.0639	
240 minute summer	S4	SP4	S5	14.1	0.567	0.472	1.1874	
240 minute summer	S5	SP5	S6	20.4	0.510	0.381	1.2557	
240 minute summer	S6_1	SP6_1	S6_2	5.5	1.081	0.033	0.0928	
240 minute summer	S6_2	SP6_2	S6_3	5.4	0.904	0.032	0.2909	
240 minute summer	S6_3	SP6_3	S6	5.4	0.767	0.052	0.1169	
240 minute summer	S6	SP6	S7	26.8	0.513	0.501	1.5861	
240 minute summer	S7	SP7	ATTN	26.4	0.717	0.495	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.8				118.6

Results for 30 year +20% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	240	26.100	0.375	3.9	0.7641	0.0000	SURCHARGED
360 minute summer	S2	240	26.100	0.439	5.2	0.6368	0.0000	SURCHARGED
360 minute summer	S3	240	26.100	0.489	5.2	0.5528	0.0000	SURCHARGED
360 minute summer	S4_1	184	29.058	0.033	3.3	0.0622	0.0000	OK
360 minute summer	S4_2	184	27.745	0.045	7.8	0.0767	0.0000	OK
360 minute summer	S4	240	26.100	0.530	11.3	0.5990	0.0000	SURCHARGED
360 minute summer	S5	240	26.098	0.628	15.8	0.9708	0.0000	SURCHARGED
360 minute summer	S6_1	184	29.684	0.034	4.3	0.0701	0.0000	OK
360 minute summer	S6_2	184	29.283	0.033	4.3	0.0371	0.0000	OK
360 minute summer	S6_3	184	28.198	0.042	4.2	0.0475	0.0000	OK
360 minute summer	S6	240	26.098	0.670	21.0	0.8181	0.0000	SURCHARGED
360 minute summer	S7	240	26.097	0.722	20.8	0.8169	0.0000	SURCHARGED
360 minute summer	ATTN	240	26.097	0.767	20.5	56.9323	0.0000	SURCHARGED
360 minute summer	S8_OUT	8	25.271	0.000	5.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	3.4	0.426	0.113	0.7599	
360 minute summer	S2	SP2	S3	5.2	0.519	0.173	0.5864	
360 minute summer	S3	SP3	S4	4.6	0.378	0.152	0.4837	
360 minute summer	S4_1	SP4_1	S4_2	3.3	0.944	0.044	0.0583	
360 minute summer	S4_2	SP4_2	S4	7.8	1.412	0.081	0.0533	
360 minute summer	S4	SP4	S5	10.5	0.537	0.352	1.1874	
360 minute summer	S5	SP5	S6	15.5	0.489	0.290	1.2557	
360 minute summer	S6_1	SP6_1	S6_2	4.3	1.006	0.026	0.0780	
360 minute summer	S6_2	SP6_2	S6_3	4.2	0.842	0.025	0.2440	
360 minute summer	S6_3	SP6_3	S6	4.2	0.714	0.041	0.0980	
360 minute summer	S6	SP6	S7	20.8	0.491	0.389	1.5861	
360 minute summer	S7	SP7	ATTN	20.5	0.644	0.384	1.3475	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.7				136.7

Results for 30 year +20% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	312	26.074	0.349	3.1	0.7103	0.0000	SURCHARGED
480 minute summer	S2	312	26.073	0.412	4.7	0.5985	0.0000	SURCHARGED
480 minute summer	S3	312	26.073	0.462	4.0	0.5229	0.0000	SURCHARGED
480 minute summer	S4_1	248	29.055	0.030	2.7	0.0566	0.0000	OK
480 minute summer	S4_2	248	27.741	0.041	6.3	0.0689	0.0000	OK
480 minute summer	S4	312	26.073	0.503	9.5	0.5692	0.0000	SURCHARGED
480 minute summer	S5	312	26.072	0.602	13.1	0.9305	0.0000	SURCHARGED
480 minute summer	S6_1	248	29.680	0.030	3.4	0.0625	0.0000	OK
480 minute summer	S6_2	248	29.280	0.029	3.4	0.0334	0.0000	OK
480 minute summer	S6_3	248	28.194	0.038	3.4	0.0429	0.0000	OK
480 minute summer	S6	312	26.072	0.644	17.2	0.7862	0.0000	SURCHARGED
480 minute summer	S7	312	26.071	0.696	17.0	0.7875	0.0000	SURCHARGED
480 minute summer	ATTN	312	26.071	0.741	16.8	55.0012	0.0000	SURCHARGED
480 minute summer	S8_OUT	8	25.271	0.000	5.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	3.1	0.395	0.103	0.7599	
480 minute summer	S2	SP2	S3	4.0	0.514	0.134	0.5864	
480 minute summer	S3	SP3	S4	3.9	0.362	0.131	0.4837	
480 minute summer	S4_1	SP4_1	S4_2	2.7	0.892	0.036	0.0507	
480 minute summer	S4_2	SP4_2	S4	6.3	1.332	0.066	0.0459	
480 minute summer	S4	SP4	S5	8.7	0.513	0.292	1.1874	
480 minute summer	S5	SP5	S6	12.8	0.477	0.239	1.2557	
480 minute summer	S6_1	SP6_1	S6_2	3.4	0.938	0.021	0.0664	
480 minute summer	S6_2	SP6_2	S6_3	3.4	0.789	0.020	0.2094	
480 minute summer	S6_3	SP6_3	S6	3.4	0.672	0.033	0.0846	
480 minute summer	S6	SP6	S7	17.0	0.480	0.318	1.5861	
480 minute summer	S7	SP7	ATTN	16.8	0.560	0.314	1.3475	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.6				150.2

Results for 30 year +20% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	390	26.040	0.315	2.6	0.6429	0.0000	SURCHARGED
600 minute summer	S2	390	26.040	0.379	4.0	0.5505	0.0000	SURCHARGED
600 minute summer	S3	390	26.040	0.429	4.0	0.4856	0.0000	SURCHARGED
600 minute summer	S4_1	315	29.052	0.027	2.2	0.0512	0.0000	OK
600 minute summer	S4_2	315	27.737	0.037	5.2	0.0625	0.0000	OK
600 minute summer	S4	390	26.040	0.470	8.7	0.5318	0.0000	SURCHARGED
600 minute summer	S5	390	26.039	0.569	11.7	0.8794	0.0000	SURCHARGED
600 minute summer	S6_1	315	29.678	0.028	2.8	0.0570	0.0000	OK
600 minute summer	S6_2	315	29.277	0.027	2.8	0.0305	0.0000	OK
600 minute summer	S6_3	315	28.191	0.035	2.8	0.0391	0.0000	OK
600 minute summer	S6	390	26.039	0.611	14.6	0.7459	0.0000	SURCHARGED
600 minute summer	S7	390	26.038	0.663	14.4	0.7502	0.0000	SURCHARGED
600 minute summer	ATTN	390	26.038	0.708	14.3	52.5421	0.0000	SURCHARGED
600 minute summer	S8_OUT	15	25.271	0.000	5.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	2.6	0.400	0.086	0.7599	
600 minute summer	S2	SP2	S3	4.0	0.487	0.132	0.5864	
600 minute summer	S3	SP3	S4	3.5	0.355	0.116	0.4837	
600 minute summer	S4_1	SP4_1	S4_2	2.2	0.839	0.029	0.0440	
600 minute summer	S4_2	SP4_2	S4	5.2	1.262	0.054	0.0399	
600 minute summer	S4	SP4	S5	8.0	0.505	0.267	1.1874	
600 minute summer	S5	SP5	S6	10.9	0.462	0.204	1.2557	
600 minute summer	S6_1	SP6_1	S6_2	2.8	0.887	0.017	0.0578	
600 minute summer	S6_2	SP6_2	S6_3	2.8	0.742	0.017	0.1825	
600 minute summer	S6_3	SP6_3	S6	2.8	0.634	0.027	0.0738	
600 minute summer	S6	SP6	S7	14.4	0.467	0.270	1.5861	
600 minute summer	S7	SP7	ATTN	14.3	0.559	0.267	1.3475	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.5				161.9

Results for 30 year +20% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	450	26.014	0.289	2.3	0.5883	0.0000	SURCHARGED
720 minute summer	S2	450	26.014	0.353	3.5	0.5116	0.0000	SURCHARGED
720 minute summer	S3	450	26.013	0.402	3.5	0.4552	0.0000	SURCHARGED
720 minute summer	S4_1	375	29.051	0.026	2.0	0.0490	0.0000	OK
720 minute summer	S4_2	375	27.735	0.035	4.7	0.0594	0.0000	OK
720 minute summer	S4	450	26.013	0.443	7.8	0.5014	0.0000	SURCHARGED
720 minute summer	S5	450	26.012	0.542	10.6	0.8376	0.0000	SURCHARGED
720 minute summer	S6_1	375	29.677	0.027	2.6	0.0551	0.0000	OK
720 minute summer	S6_2	375	29.276	0.026	2.6	0.0294	0.0000	OK
720 minute summer	S6_3	375	28.189	0.033	2.6	0.0377	0.0000	OK
720 minute summer	S6	450	26.012	0.584	13.2	0.7128	0.0000	SURCHARGED
720 minute summer	S7	450	26.011	0.636	12.8	0.7194	0.0000	SURCHARGED
720 minute summer	ATTN	450	26.010	0.680	12.7	50.4992	0.0000	SURCHARGED
720 minute summer	S8_OUT	15	25.271	0.000	5.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	2.3	0.388	0.077	0.7599	
720 minute summer	S2	SP2	S3	3.5	0.474	0.115	0.5864	
720 minute summer	S3	SP3	S4	3.1	0.344	0.102	0.4837	
720 minute summer	S4_1	SP4_1	S4_2	2.0	0.815	0.027	0.0411	
720 minute summer	S4_2	SP4_2	S4	4.7	1.228	0.049	0.0371	
720 minute summer	S4	SP4	S5	7.2	0.494	0.240	1.1874	
720 minute summer	S5	SP5	S6	9.9	0.460	0.184	1.2557	
720 minute summer	S6_1	SP6_1	S6_2	2.6	0.869	0.016	0.0549	
720 minute summer	S6_2	SP6_2	S6_3	2.6	0.726	0.015	0.1731	
720 minute summer	S6_3	SP6_3	S6	2.6	0.621	0.025	0.0700	
720 minute summer	S6	SP6	S7	12.8	0.460	0.240	1.5861	
720 minute summer	S7	SP7	ATTN	12.7	0.541	0.238	1.3475	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.4				172.3

Results for 30 year +20% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	585	25.952	0.227	1.9	0.4618	0.0000	SURCHARGED
960 minute summer	S2	585	25.952	0.291	2.9	0.4216	0.0000	SURCHARGED
960 minute summer	S3	585	25.951	0.340	2.9	0.3851	0.0000	SURCHARGED
960 minute summer	S4_1	495	29.049	0.024	1.7	0.0453	0.0000	OK
960 minute summer	S4_2	495	27.732	0.032	3.9	0.0540	0.0000	OK
960 minute summer	S4	585	25.951	0.381	6.6	0.4313	0.0000	SURCHARGED
960 minute summer	S5	585	25.950	0.480	8.9	0.7422	0.0000	SURCHARGED
960 minute summer	S6_1	495	29.674	0.024	2.1	0.0497	0.0000	OK
960 minute summer	S6_2	495	29.274	0.024	2.1	0.0266	0.0000	OK
960 minute summer	S6_3	495	28.186	0.030	2.1	0.0340	0.0000	OK
960 minute summer	S6	585	25.950	0.522	11.0	0.6375	0.0000	SURCHARGED
960 minute summer	S7	585	25.949	0.574	10.6	0.6497	0.0000	SURCHARGED
960 minute summer	ATTN	585	25.949	0.619	10.5	45.8997	0.0000	SURCHARGED
960 minute summer	S8_OUT	15	25.271	0.000	5.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	1.9	0.365	0.064	0.7597	
960 minute summer	S2	SP2	S3	2.9	0.460	0.097	0.5864	
960 minute summer	S3	SP3	S4	2.7	0.334	0.089	0.4837	
960 minute summer	S4_1	SP4_1	S4_2	1.7	0.777	0.023	0.0367	
960 minute summer	S4_2	SP4_2	S4	3.9	1.163	0.041	0.0325	
960 minute summer	S4	SP4	S5	6.1	0.479	0.204	1.1874	
960 minute summer	S5	SP5	S6	8.4	0.448	0.156	1.2557	
960 minute summer	S6_1	SP6_1	S6_2	2.1	0.812	0.013	0.0474	
960 minute summer	S6_2	SP6_2	S6_3	2.1	0.685	0.013	0.1492	
960 minute summer	S6_3	SP6_3	S6	2.1	0.583	0.020	0.0602	
960 minute summer	S6	SP6	S7	10.6	0.455	0.199	1.5861	
960 minute summer	S7	SP7	ATTN	10.5	0.523	0.197	1.3475	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.2				189.8

Results for 30 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	870	25.832	0.107	1.4	0.2173	0.0000	OK
1440 minute summer	S2	870	25.832	0.171	2.2	0.2475	0.0000	OK
1440 minute summer	S3	870	25.832	0.221	2.2	0.2494	0.0000	OK
1440 minute summer	S4_1	750	29.045	0.020	1.2	0.0383	0.0000	OK
1440 minute summer	S4_2	750	27.728	0.028	2.9	0.0467	0.0000	OK
1440 minute summer	S4	870	25.831	0.261	5.1	0.2957	0.0000	SURCHARGED
1440 minute summer	S5	870	25.831	0.361	7.2	0.5571	0.0000	SURCHARGED
1440 minute summer	S6_1	750	29.671	0.021	1.6	0.0438	0.0000	OK
1440 minute summer	S6_2	750	29.271	0.021	1.6	0.0235	0.0000	OK
1440 minute summer	S6_3	750	28.182	0.026	1.6	0.0298	0.0000	OK
1440 minute summer	S6	870	25.830	0.402	8.9	0.4913	0.0000	SURCHARGED
1440 minute summer	S7	870	25.830	0.455	8.6	0.5145	0.0000	SURCHARGED
1440 minute summer	ATTN	870	25.829	0.499	8.2	36.9791	0.0000	SURCHARGED
1440 minute summer	S8_OUT	30	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	1.4	0.331	0.047	0.4855	
1440 minute summer	S2	SP2	S3	2.2	0.438	0.073	0.5297	
1440 minute summer	S3	SP3	S4	2.2	0.320	0.073	0.4823	
1440 minute summer	S4_1	SP4_1	S4_2	1.2	0.702	0.016	0.0286	
1440 minute summer	S4_2	SP4_2	S4	2.9	1.067	0.030	0.0263	
1440 minute summer	S4	SP4	S5	5.1	0.467	0.169	1.1874	
1440 minute summer	S5	SP5	S6	6.8	0.436	0.128	1.2557	
1440 minute summer	S6_1	SP6_1	S6_2	1.6	0.747	0.010	0.0392	
1440 minute summer	S6_2	SP6_2	S6_3	1.6	0.627	0.010	0.1230	
1440 minute summer	S6_3	SP6_3	S6	1.6	0.539	0.016	0.0496	
1440 minute summer	S6	SP6	S7	8.6	0.442	0.160	1.5861	
1440 minute summer	S7	SP7	ATTN	8.2	0.381	0.154	1.3475	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				215.5

Results for 100 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	12	26.323	0.598	16.2	1.2194	0.0000	SURCHARGED
15 minute summer	S2	12	26.309	0.648	20.3	0.9397	0.0000	SURCHARGED
15 minute summer	S3	12	26.281	0.670	20.1	0.7583	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.093	0.068	14.0	0.1303	0.0000	OK
15 minute summer	S4_2	10	27.800	0.100	32.5	0.1695	0.0000	OK
15 minute summer	S4	12	26.257	0.687	46.6	0.7773	0.0000	SURCHARGED
15 minute summer	S5	12	25.983	0.513	66.8	0.7921	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.719	0.069	17.8	0.1426	0.0000	OK
15 minute summer	S6_2	10	29.315	0.065	17.7	0.0733	0.0000	OK
15 minute summer	S6_3	11	28.243	0.087	17.4	0.0987	0.0000	OK
15 minute summer	S6	12	25.900	0.472	87.4	0.5762	0.0000	SURCHARGED
15 minute summer	S7	19	25.779	0.404	85.2	0.4565	0.0000	SURCHARGED
15 minute summer	ATTN	19	25.780	0.450	84.9	33.3090	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	12.7	0.565	0.424	0.7599	
15 minute summer	S2	SP2	S3	20.1	0.593	0.670	0.5864	
15 minute summer	S3	SP3	S4	22.7	0.571	0.757	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	13.8	1.412	0.184	0.1642	
15 minute summer	S4_2	SP4_2	S4	32.4	2.035	0.338	0.1541	
15 minute summer	S4	SP4	S5	45.5	1.144	1.523	1.1874	
15 minute summer	S5	SP5	S6	64.9	0.921	1.213	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	17.7	1.512	0.107	0.2143	
15 minute summer	S6_2	SP6_2	S6_3	17.4	1.276	0.104	0.6765	
15 minute summer	S6_3	SP6_3	S6	17.4	1.064	0.169	0.2736	
15 minute summer	S6	SP6	S7	85.2	1.209	1.593	1.5861	
15 minute summer	S7	SP7	ATTN	84.9	1.663	1.588	1.3475	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.7				43.9

Results for 100 year 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.352	0.627	15.4	1.2782	0.0000	SURCHARGED
30 minute summer	S2	20	26.339	0.678	18.9	0.9838	0.0000	SURCHARGED
30 minute summer	S3	20	26.314	0.703	18.5	0.7947	0.0000	SURCHARGED
30 minute summer	S4_1	18	29.092	0.067	13.3	0.1273	0.0000	OK
30 minute summer	S4_2	18	27.798	0.098	31.1	0.1652	0.0000	OK
30 minute summer	S4	20	26.290	0.720	44.6	0.8142	0.0000	SURCHARGED
30 minute summer	S5	20	26.045	0.575	63.6	0.8877	0.0000	SURCHARGED
30 minute summer	S6_1	18	29.717	0.067	16.9	0.1389	0.0000	OK
30 minute summer	S6_2	18	29.314	0.064	16.9	0.0722	0.0000	OK
30 minute summer	S6_3	18	28.241	0.085	16.9	0.0964	0.0000	OK
30 minute summer	S6	20	25.974	0.546	83.6	0.6671	0.0000	SURCHARGED
30 minute summer	S7	33	25.937	0.562	82.5	0.6355	0.0000	SURCHARGED
30 minute summer	ATTN	33	25.937	0.607	81.2	45.0339	0.0000	SURCHARGED
30 minute summer	S8_OUT	1	25.271	0.000	5.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	12.0	0.547	0.400	0.7599	
30 minute summer	S2	SP2	S3	18.5	0.576	0.615	0.5864	
30 minute summer	S3	SP3	S4	20.3	0.511	0.679	0.4837	
30 minute summer	S4_1	SP4_1	S4_2	13.3	1.399	0.177	0.1593	
30 minute summer	S4_2	SP4_2	S4	31.1	2.019	0.325	0.1493	
30 minute summer	S4	SP4	S5	43.4	1.090	1.452	1.1874	
30 minute summer	S5	SP5	S6	62.4	0.886	1.166	1.2557	
30 minute summer	S6_1	SP6_1	S6_2	16.9	1.491	0.103	0.2079	
30 minute summer	S6_2	SP6_2	S6_3	16.9	1.254	0.101	0.6590	
30 minute summer	S6_3	SP6_3	S6	16.6	1.052	0.161	0.2644	
30 minute summer	S6	SP6	S7	82.5	1.171	1.543	1.5861	
30 minute summer	S7	SP7	ATTN	81.2	1.195	1.520	1.3475	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.1				60.5

Results for 100 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	35	26.202	0.477	12.0	0.9726	0.0000	SURCHARGED
60 minute summer	S2	35	26.194	0.533	15.1	0.7732	0.0000	SURCHARGED
60 minute summer	S3	35	26.178	0.567	14.5	0.6415	0.0000	SURCHARGED
60 minute summer	S4_1	33	29.083	0.058	10.3	0.1111	0.0000	OK
60 minute summer	S4_2	33	27.784	0.084	24.1	0.1420	0.0000	OK
60 minute summer	S4	35	26.165	0.595	35.6	0.6728	0.0000	SURCHARGED
60 minute summer	S5	60	26.072	0.602	51.0	0.9304	0.0000	SURCHARGED
60 minute summer	S6_1	33	29.709	0.059	13.1	0.1218	0.0000	OK
60 minute summer	S6_2	33	29.306	0.056	13.1	0.0637	0.0000	OK
60 minute summer	S6_3	33	28.231	0.075	13.1	0.0844	0.0000	OK
60 minute summer	S6	61	26.072	0.644	66.4	0.7861	0.0000	SURCHARGED
60 minute summer	S7	61	26.071	0.696	65.4	0.7874	0.0000	SURCHARGED
60 minute summer	ATTN	62	26.071	0.741	64.5	55.0368	0.0000	SURCHARGED
60 minute summer	S8_OUT	1	25.271	0.000	5.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	9.6	0.521	0.321	0.7599	
60 minute summer	S2	SP2	S3	14.5	0.561	0.481	0.5864	
60 minute summer	S3	SP3	S4	14.8	0.377	0.494	0.4837	
60 minute summer	S4_1	SP4_1	S4_2	10.3	1.305	0.137	0.1323	
60 minute summer	S4_2	SP4_2	S4	24.1	1.899	0.252	0.1230	
60 minute summer	S4	SP4	S5	34.9	0.877	1.167	1.1874	
60 minute summer	S5	SP5	S6	49.6	0.705	0.928	1.2557	
60 minute summer	S6_1	SP6_1	S6_2	13.1	1.388	0.080	0.1730	
60 minute summer	S6_2	SP6_2	S6_3	13.1	1.161	0.078	0.5486	
60 minute summer	S6_3	SP6_3	S6	13.0	0.983	0.126	0.2206	
60 minute summer	S6	SP6	S7	65.4	0.929	1.223	1.5861	
60 minute summer	S7	SP7	ATTN	64.5	1.031	1.206	1.3475	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.6				77.5

Results for 100 year 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	106	26.151	0.426	8.1	0.8680	0.0000	SURCHARGED
120 minute summer	S2	104	26.151	0.490	11.1	0.7107	0.0000	SURCHARGED
120 minute summer	S3	104	26.151	0.540	10.2	0.6104	0.0000	SURCHARGED
120 minute summer	S4_1	64	29.073	0.048	7.0	0.0909	0.0000	OK
120 minute summer	S4_2	64	27.767	0.067	16.3	0.1139	0.0000	OK
120 minute summer	S4	104	26.151	0.581	24.9	0.6566	0.0000	SURCHARGED
120 minute summer	S5	104	26.149	0.679	35.4	1.0494	0.0000	SURCHARGED
120 minute summer	S6_1	64	29.699	0.049	8.9	0.1002	0.0000	OK
120 minute summer	S6_2	64	29.297	0.047	8.9	0.0528	0.0000	OK
120 minute summer	S6_3	64	28.217	0.061	8.9	0.0693	0.0000	OK
120 minute summer	S6	104	26.149	0.721	45.7	0.8801	0.0000	SURCHARGED
120 minute summer	S7	106	26.148	0.773	45.2	0.8743	0.0000	SURCHARGED
120 minute summer	ATTN	106	26.147	0.817	44.6	60.7202	0.0000	SURCHARGED
120 minute summer	S8_OUT	2	25.271	0.000	5.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	7.2	0.494	0.242	0.7599	
120 minute summer	S2	SP2	S3	10.2	0.551	0.339	0.5864	
120 minute summer	S3	SP3	S4	9.8	0.389	0.328	0.4837	
120 minute summer	S4_1	SP4_1	S4_2	7.0	1.173	0.093	0.1000	
120 minute summer	S4_2	SP4_2	S4	16.3	1.721	0.170	0.0918	
120 minute summer	S4	SP4	S5	24.5	0.638	0.821	1.1874	
120 minute summer	S5	SP5	S6	34.6	0.563	0.647	1.2557	
120 minute summer	S6_1	SP6_1	S6_2	8.9	1.244	0.054	0.1311	
120 minute summer	S6_2	SP6_2	S6_3	8.9	1.040	0.053	0.4158	
120 minute summer	S6_3	SP6_3	S6	8.9	0.885	0.086	0.1677	
120 minute summer	S6	SP6	S7	45.2	0.641	0.845	1.5861	
120 minute summer	S7	SP7	ATTN	44.6	0.872	0.835	1.3475	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.9				97.3

Results for 100 year 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	136	26.171	0.446	6.1	0.9083	0.0000	SURCHARGED
180 minute summer	S2	136	26.171	0.510	8.2	0.7395	0.0000	SURCHARGED
180 minute summer	S3	140	26.170	0.559	7.6	0.6328	0.0000	SURCHARGED
180 minute summer	S4_1	96	29.066	0.041	5.3	0.0790	0.0000	OK
180 minute summer	S4_2	96	27.758	0.058	12.4	0.0982	0.0000	OK
180 minute summer	S4	140	26.170	0.600	19.2	0.6790	0.0000	SURCHARGED
180 minute summer	S5	140	26.169	0.699	27.6	1.0801	0.0000	SURCHARGED
180 minute summer	S6_1	96	29.692	0.042	6.7	0.0869	0.0000	OK
180 minute summer	S6_2	96	29.291	0.041	6.7	0.0460	0.0000	OK
180 minute summer	S6_3	96	28.209	0.053	6.7	0.0601	0.0000	OK
180 minute summer	S6	140	26.169	0.741	35.6	0.9044	0.0000	SURCHARGED
180 minute summer	S7	140	26.168	0.793	35.0	0.8968	0.0000	SURCHARGED
180 minute summer	ATTN	140	26.167	0.837	34.5	62.2096	0.0000	SURCHARGED
180 minute summer	S8_OUT	4	25.271	0.000	6.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	5.1	0.474	0.171	0.7599	
180 minute summer	S2	SP2	S3	7.6	0.543	0.254	0.5864	
180 minute summer	S3	SP3	S4	7.0	0.391	0.233	0.4837	
180 minute summer	S4_1	SP4_1	S4_2	5.3	1.083	0.070	0.0820	
180 minute summer	S4_2	SP4_2	S4	12.4	1.601	0.130	0.0750	
180 minute summer	S4	SP4	S5	18.7	0.595	0.625	1.1874	
180 minute summer	S5	SP5	S6	26.9	0.524	0.502	1.2557	
180 minute summer	S6_1	SP6_1	S6_2	6.7	1.146	0.041	0.1071	
180 minute summer	S6_2	SP6_2	S6_3	6.7	0.960	0.040	0.3395	
180 minute summer	S6_3	SP6_3	S6	6.7	0.817	0.065	0.1371	
180 minute summer	S6	SP6	S7	35.0	0.533	0.655	1.5861	
180 minute summer	S7	SP7	ATTN	34.5	0.760	0.646	1.3475	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.0				112.2

Results for 100 year 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	172	26.170	0.445	5.3	0.9073	0.0000	SURCHARGED
240 minute summer	S2	172	26.170	0.509	7.4	0.7387	0.0000	SURCHARGED
240 minute summer	S3	172	26.170	0.559	6.5	0.6322	0.0000	SURCHARGED
240 minute summer	S4_1	124	29.063	0.038	4.5	0.0726	0.0000	OK
240 minute summer	S4_2	124	27.753	0.053	10.6	0.0901	0.0000	OK
240 minute summer	S4	172	26.170	0.600	16.0	0.6785	0.0000	SURCHARGED
240 minute summer	S5	172	26.169	0.699	22.7	1.0792	0.0000	SURCHARGED
240 minute summer	S6_1	124	29.689	0.039	5.8	0.0810	0.0000	OK
240 minute summer	S6_2	124	29.288	0.038	5.8	0.0428	0.0000	OK
240 minute summer	S6_3	124	28.205	0.049	5.7	0.0553	0.0000	OK
240 minute summer	S6	172	26.168	0.740	29.4	0.9037	0.0000	SURCHARGED
240 minute summer	S7	172	26.167	0.792	29.1	0.8962	0.0000	SURCHARGED
240 minute summer	ATTN	172	26.167	0.837	28.7	62.1680	0.0000	SURCHARGED
240 minute summer	S8_OUT	4	25.271	0.000	6.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	4.8	0.450	0.162	0.7599	
240 minute summer	S2	SP2	S3	6.5	0.537	0.215	0.5864	
240 minute summer	S3	SP3	S4	6.0	0.389	0.201	0.4837	
240 minute summer	S4_1	SP4_1	S4_2	4.5	1.032	0.059	0.0727	
240 minute summer	S4_2	SP4_2	S4	10.5	1.534	0.110	0.0666	
240 minute summer	S4	SP4	S5	15.6	0.564	0.524	1.1874	
240 minute summer	S5	SP5	S6	22.3	0.507	0.417	1.2557	
240 minute summer	S6_1	SP6_1	S6_2	5.8	1.099	0.035	0.0963	
240 minute summer	S6_2	SP6_2	S6_3	5.7	0.918	0.034	0.3025	
240 minute summer	S6_3	SP6_3	S6	5.7	0.778	0.055	0.1216	
240 minute summer	S6	SP6	S7	29.1	0.510	0.544	1.5861	
240 minute summer	S7	SP7	ATTN	28.7	0.724	0.537	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.0				124.7

Results for 100 year 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	240	26.153	0.428	4.1	0.8717	0.0000	SURCHARGED
360 minute summer	S2	240	26.153	0.492	5.4	0.7134	0.0000	SURCHARGED
360 minute summer	S3	240	26.152	0.541	5.3	0.6124	0.0000	SURCHARGED
360 minute summer	S4_1	184	29.058	0.033	3.5	0.0641	0.0000	OK
360 minute summer	S4_2	184	27.746	0.046	8.2	0.0787	0.0000	OK
360 minute summer	S4	240	26.152	0.582	11.6	0.6587	0.0000	SURCHARGED
360 minute summer	S5	240	26.151	0.681	16.7	1.0520	0.0000	SURCHARGED
360 minute summer	S6_1	184	29.685	0.035	4.5	0.0716	0.0000	OK
360 minute summer	S6_2	184	29.284	0.034	4.5	0.0380	0.0000	OK
360 minute summer	S6_3	184	28.199	0.043	4.5	0.0487	0.0000	OK
360 minute summer	S6	240	26.151	0.723	22.2	0.8822	0.0000	SURCHARGED
360 minute summer	S7	240	26.150	0.775	21.9	0.8762	0.0000	SURCHARGED
360 minute summer	ATTN	240	26.149	0.819	21.6	60.8429	0.0000	SURCHARGED
360 minute summer	S8_OUT	8	25.271	0.000	5.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	3.5	0.435	0.116	0.7599	
360 minute summer	S2	SP2	S3	5.3	0.520	0.176	0.5864	
360 minute summer	S3	SP3	S4	4.5	0.377	0.151	0.4837	
360 minute summer	S4_1	SP4_1	S4_2	3.5	0.960	0.046	0.0607	
360 minute summer	S4_2	SP4_2	S4	8.2	1.431	0.085	0.0552	
360 minute summer	S4	SP4	S5	11.3	0.535	0.379	1.1874	
360 minute summer	S5	SP5	S6	16.4	0.490	0.306	1.2557	
360 minute summer	S6_1	SP6_1	S6_2	4.5	1.019	0.027	0.0806	
360 minute summer	S6_2	SP6_2	S6_3	4.5	0.853	0.027	0.2523	
360 minute summer	S6_3	SP6_3	S6	4.4	0.724	0.043	0.1014	
360 minute summer	S6	SP6	S7	21.9	0.487	0.410	1.5861	
360 minute summer	S7	SP7	ATTN	21.6	0.646	0.405	1.3475	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.9				143.0

Results for 100 year 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	312	26.127	0.402	3.3	0.8198	0.0000	SURCHARGED
480 minute summer	S2	312	26.127	0.466	5.0	0.6764	0.0000	SURCHARGED
480 minute summer	S3	312	26.127	0.516	4.3	0.5837	0.0000	SURCHARGED
480 minute summer	S4_1	248	29.055	0.030	2.8	0.0576	0.0000	OK
480 minute summer	S4_2	248	27.742	0.042	6.6	0.0705	0.0000	OK
480 minute summer	S4	312	26.127	0.557	9.7	0.6299	0.0000	SURCHARGED
480 minute summer	S5	312	26.126	0.656	14.2	1.0130	0.0000	SURCHARGED
480 minute summer	S6_1	248	29.681	0.031	3.6	0.0643	0.0000	OK
480 minute summer	S6_2	248	29.280	0.030	3.6	0.0343	0.0000	OK
480 minute summer	S6_3	248	28.195	0.039	3.6	0.0441	0.0000	OK
480 minute summer	S6	312	26.125	0.697	18.6	0.8514	0.0000	SURCHARGED
480 minute summer	S7	312	26.125	0.750	18.4	0.8477	0.0000	SURCHARGED
480 minute summer	ATTN	312	26.124	0.794	18.2	58.9682	0.0000	SURCHARGED
480 minute summer	S8_OUT	8	25.271	0.000	5.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	3.3	0.404	0.109	0.7599	
480 minute summer	S2	SP2	S3	4.3	0.507	0.144	0.5864	
480 minute summer	S3	SP3	S4	3.8	0.368	0.128	0.4837	
480 minute summer	S4_1	SP4_1	S4_2	2.8	0.902	0.037	0.0521	
480 minute summer	S4_2	SP4_2	S4	6.6	1.349	0.069	0.0474	
480 minute summer	S4	SP4	S5	9.5	0.515	0.318	1.1874	
480 minute summer	S5	SP5	S6	13.9	0.475	0.260	1.2557	
480 minute summer	S6_1	SP6_1	S6_2	3.6	0.954	0.022	0.0691	
480 minute summer	S6_2	SP6_2	S6_3	3.6	0.801	0.021	0.2180	
480 minute summer	S6_3	SP6_3	S6	3.6	0.683	0.035	0.0880	
480 minute summer	S6	SP6	S7	18.4	0.475	0.344	1.5861	
480 minute summer	S7	SP7	ATTN	18.2	0.574	0.340	1.3475	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.8				157.9

Results for 100 year 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	390	26.094	0.369	2.7	0.7515	0.0000	SURCHARGED
600 minute summer	S2	390	26.094	0.433	4.1	0.6278	0.0000	SURCHARGED
600 minute summer	S3	390	26.094	0.483	3.6	0.5458	0.0000	SURCHARGED
600 minute summer	S4_1	315	29.052	0.027	2.3	0.0523	0.0000	OK
600 minute summer	S4_2	315	27.738	0.038	5.4	0.0637	0.0000	OK
600 minute summer	S4	390	26.093	0.523	8.4	0.5921	0.0000	SURCHARGED
600 minute summer	S5	390	26.092	0.622	11.8	0.9617	0.0000	SURCHARGED
600 minute summer	S6_1	315	29.679	0.029	3.0	0.0589	0.0000	OK
600 minute summer	S6_2	315	29.278	0.028	3.0	0.0315	0.0000	OK
600 minute summer	S6_3	315	28.192	0.036	3.0	0.0404	0.0000	OK
600 minute summer	S6	390	26.092	0.664	15.5	0.8109	0.0000	SURCHARGED
600 minute summer	S7	390	26.092	0.717	15.3	0.8104	0.0000	SURCHARGED
600 minute summer	ATTN	390	26.091	0.761	15.1	56.5127	0.0000	SURCHARGED
600 minute summer	S8_OUT	15	25.271	0.000	5.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	2.7	0.385	0.090	0.7599	
600 minute summer	S2	SP2	S3	3.6	0.495	0.118	0.5864	
600 minute summer	S3	SP3	S4	3.3	0.362	0.111	0.4837	
600 minute summer	S4_1	SP4_1	S4_2	2.3	0.850	0.031	0.0454	
600 minute summer	S4_2	SP4_2	S4	5.4	1.275	0.056	0.0410	
600 minute summer	S4	SP4	S5	7.9	0.506	0.264	1.1874	
600 minute summer	S5	SP5	S6	11.6	0.466	0.216	1.2557	
600 minute summer	S6_1	SP6_1	S6_2	3.0	0.905	0.018	0.0608	
600 minute summer	S6_2	SP6_2	S6_3	3.0	0.759	0.018	0.1917	
600 minute summer	S6_3	SP6_3	S6	3.0	0.647	0.029	0.0774	
600 minute summer	S6	SP6	S7	15.3	0.465	0.286	1.5861	
600 minute summer	S7	SP7	ATTN	15.1	0.568	0.283	1.3475	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.7				169.0

Results for 100 year 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	450	26.059	0.334	2.4	0.6805	0.0000	SURCHARGED
720 minute summer	S2	450	26.059	0.398	3.7	0.5773	0.0000	SURCHARGED
720 minute summer	S3	450	26.059	0.448	3.7	0.5064	0.0000	SURCHARGED
720 minute summer	S4_1	375	29.051	0.026	2.1	0.0501	0.0000	OK
720 minute summer	S4_2	375	27.736	0.036	4.9	0.0606	0.0000	OK
720 minute summer	S4	450	26.059	0.489	8.0	0.5526	0.0000	SURCHARGED
720 minute summer	S5	450	26.057	0.587	10.9	0.9074	0.0000	SURCHARGED
720 minute summer	S6_1	375	29.677	0.027	2.7	0.0560	0.0000	OK
720 minute summer	S6_2	375	29.277	0.026	2.7	0.0300	0.0000	OK
720 minute summer	S6_3	375	28.190	0.034	2.7	0.0384	0.0000	OK
720 minute summer	S6	450	26.057	0.629	13.8	0.7679	0.0000	SURCHARGED
720 minute summer	S7	450	26.056	0.681	13.7	0.7704	0.0000	SURCHARGED
720 minute summer	ATTN	450	26.055	0.725	13.5	53.8605	0.0000	SURCHARGED
720 minute summer	S8_OUT	15	25.271	0.000	5.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	2.4	0.391	0.080	0.7599	
720 minute summer	S2	SP2	S3	3.7	0.483	0.121	0.5864	
720 minute summer	S3	SP3	S4	3.2	0.354	0.105	0.4837	
720 minute summer	S4_1	SP4_1	S4_2	2.1	0.827	0.028	0.0426	
720 minute summer	S4_2	SP4_2	S4	4.9	1.242	0.051	0.0382	
720 minute summer	S4	SP4	S5	7.4	0.486	0.246	1.1874	
720 minute summer	S5	SP5	S6	10.3	0.461	0.193	1.2557	
720 minute summer	S6_1	SP6_1	S6_2	2.7	0.878	0.016	0.0563	
720 minute summer	S6_2	SP6_2	S6_3	2.7	0.734	0.016	0.1778	
720 minute summer	S6_3	SP6_3	S6	2.7	0.628	0.026	0.0719	
720 minute summer	S6	SP6	S7	13.7	0.466	0.256	1.5861	
720 minute summer	S7	SP7	ATTN	13.5	0.551	0.253	1.3475	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.6				178.7

Results for 100 year 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	585	25.982	0.257	2.0	0.5234	0.0000	SURCHARGED
960 minute summer	S2	585	25.982	0.321	3.1	0.4655	0.0000	SURCHARGED
960 minute summer	S3	585	25.982	0.371	3.1	0.4192	0.0000	SURCHARGED
960 minute summer	S4_1	495	29.049	0.024	1.7	0.0453	0.0000	OK
960 minute summer	S4_2	495	27.732	0.032	4.0	0.0547	0.0000	OK
960 minute summer	S4	585	25.982	0.412	6.8	0.4655	0.0000	SURCHARGED
960 minute summer	S5	585	25.981	0.511	9.2	0.7888	0.0000	SURCHARGED
960 minute summer	S6_1	495	29.675	0.025	2.2	0.0508	0.0000	OK
960 minute summer	S6_2	495	29.274	0.024	2.2	0.0272	0.0000	OK
960 minute summer	S6_3	495	28.187	0.031	2.2	0.0347	0.0000	OK
960 minute summer	S6	585	25.980	0.552	11.5	0.6742	0.0000	SURCHARGED
960 minute summer	S7	585	25.980	0.605	11.3	0.6837	0.0000	SURCHARGED
960 minute summer	ATTN	585	25.979	0.649	11.2	48.1457	0.0000	SURCHARGED
960 minute summer	S8_OUT	15	25.271	0.000	5.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	2.0	0.370	0.067	0.7599	
960 minute summer	S2	SP2	S3	3.1	0.465	0.102	0.5864	
960 minute summer	S3	SP3	S4	2.8	0.340	0.093	0.4837	
960 minute summer	S4_1	SP4_1	S4_2	1.7	0.777	0.023	0.0367	
960 minute summer	S4_2	SP4_2	S4	4.0	1.172	0.042	0.0331	
960 minute summer	S4	SP4	S5	6.3	0.480	0.211	1.1874	
960 minute summer	S5	SP5	S6	8.6	0.451	0.161	1.2557	
960 minute summer	S6_1	SP6_1	S6_2	2.2	0.824	0.013	0.0489	
960 minute summer	S6_2	SP6_2	S6_3	2.2	0.693	0.013	0.1541	
960 minute summer	S6_3	SP6_3	S6	2.2	0.591	0.021	0.0622	
960 minute summer	S6	SP6	S7	11.3	0.452	0.211	1.5861	
960 minute summer	S7	SP7	ATTN	11.2	0.543	0.209	1.3475	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.3				195.2

Results for 100 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	870	25.858	0.133	1.5	0.2714	0.0000	OK
1440 minute summer	S2	870	25.858	0.197	2.3	0.2861	0.0000	OK
1440 minute summer	S3	870	25.858	0.247	2.3	0.2794	0.0000	SURCHARGED
1440 minute summer	S4_1	750	29.046	0.021	1.3	0.0398	0.0000	OK
1440 minute summer	S4_2	750	27.728	0.028	3.0	0.0475	0.0000	OK
1440 minute summer	S4	870	25.858	0.288	5.3	0.3257	0.0000	SURCHARGED
1440 minute summer	S5	870	25.857	0.387	7.5	0.5981	0.0000	SURCHARGED
1440 minute summer	S6_1	750	29.671	0.021	1.6	0.0438	0.0000	OK
1440 minute summer	S6_2	750	29.271	0.021	1.6	0.0235	0.0000	OK
1440 minute summer	S6_3	750	28.182	0.026	1.6	0.0298	0.0000	OK
1440 minute summer	S6	870	25.857	0.429	9.2	0.5237	0.0000	SURCHARGED
1440 minute summer	S7	870	25.856	0.481	8.8	0.5445	0.0000	SURCHARGED
1440 minute summer	ATTN	870	25.856	0.526	8.5	38.9593	0.0000	SURCHARGED
1440 minute summer	S8_OUT	30	25.271	0.000	4.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	1.5	0.341	0.050	0.5862	
1440 minute summer	S2	SP2	S3	2.3	0.444	0.076	0.5652	
1440 minute summer	S3	SP3	S4	2.3	0.325	0.076	0.4837	
1440 minute summer	S4_1	SP4_1	S4_2	1.3	0.718	0.017	0.0303	
1440 minute summer	S4_2	SP4_2	S4	3.0	1.077	0.031	0.0270	
1440 minute summer	S4	SP4	S5	5.3	0.463	0.176	1.1874	
1440 minute summer	S5	SP5	S6	7.1	0.439	0.133	1.2557	
1440 minute summer	S6_1	SP6_1	S6_2	1.6	0.747	0.010	0.0392	
1440 minute summer	S6_2	SP6_2	S6_3	1.6	0.627	0.010	0.1230	
1440 minute summer	S6_3	SP6_3	S6	1.6	0.539	0.016	0.0496	
1440 minute summer	S6	SP6	S7	8.8	0.444	0.165	1.5861	
1440 minute summer	S7	SP7	ATTN	8.5	0.381	0.159	1.3475	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.8				220.5

Results for 100 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S1	12	26.634	0.909	19.4	1.8530	0.0000	FLOOD RISK
15 minute summer	S2	12	26.615	0.954	22.3	1.3842	0.0000	SURCHARGED
15 minute summer	S3	12	26.579	0.968	23.3	1.0943	0.0000	SURCHARGED
15 minute summer	S4_1	10	29.100	0.075	16.8	0.1439	0.0000	OK
15 minute summer	S4_2	10	27.812	0.112	39.1	0.1901	0.0000	OK
15 minute summer	S4	12	26.547	0.977	53.3	1.1055	0.0000	SURCHARGED
15 minute summer	S5	12	26.177	0.707	76.6	1.0917	0.0000	SURCHARGED
15 minute summer	S6_1	10	29.726	0.076	21.3	0.1568	0.0000	OK
15 minute summer	S6_2	10	29.321	0.071	21.2	0.0802	0.0000	OK
15 minute summer	S6_3	11	28.252	0.096	20.9	0.1089	0.0000	OK
15 minute summer	S6	12	26.065	0.637	101.4	0.7772	0.0000	SURCHARGED
15 minute summer	S7	19	25.872	0.497	99.9	0.5625	0.0000	SURCHARGED
15 minute summer	ATTN	19	25.874	0.544	98.5	40.3244	0.0000	SURCHARGED
15 minute summer	S8_OUT	1	25.271	0.000	4.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S1	SP1	S2	14.7	0.573	0.490	0.7599	
15 minute summer	S2	SP2	S3	23.3	0.594	0.776	0.5864	
15 minute summer	S3	SP3	S4	26.8	0.674	0.894	0.4837	
15 minute summer	S4_1	SP4_1	S4_2	16.6	1.482	0.221	0.1880	
15 minute summer	S4_2	SP4_2	S4	38.9	2.122	0.407	0.1777	
15 minute summer	S4	SP4	S5	53.0	1.334	1.775	1.1874	
15 minute summer	S5	SP5	S6	74.7	1.060	1.396	1.2557	
15 minute summer	S6_1	SP6_1	S6_2	21.2	1.587	0.129	0.2445	
15 minute summer	S6_2	SP6_2	S6_3	20.9	1.334	0.124	0.7734	
15 minute summer	S6_3	SP6_3	S6	20.9	1.117	0.203	0.3128	
15 minute summer	S6	SP6	S7	99.9	1.419	1.870	1.5861	
15 minute summer	S7	SP7	ATTN	98.5	1.673	1.844	1.3475	
15 minute summer	ATTN	Hydro-Brake®	S8_OUT	4.9				52.3

Results for 100 year +20% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	S1	20	26.690	0.965	18.5	1.9673	0.0000	FLOOD RISK
30 minute summer	S2	20	26.672	1.011	21.9	1.4671	0.0000	SURCHARGED
30 minute summer	S3	20	26.637	1.026	22.1	1.1608	0.0000	SURCHARGED
30 minute summer	S4_1	18	29.099	0.074	16.0	0.1407	0.0000	OK
30 minute summer	S4_2	18	27.809	0.109	37.4	0.1851	0.0000	OK
30 minute summer	S4	20	26.606	1.036	52.0	1.1712	0.0000	SURCHARGED
30 minute summer	S5	20	26.266	0.796	74.5	1.2292	0.0000	SURCHARGED
30 minute summer	S6_1	18	29.724	0.074	20.3	0.1529	0.0000	OK
30 minute summer	S6_2	18	29.320	0.070	20.3	0.0791	0.0000	OK
30 minute summer	S6_3	18	28.250	0.094	20.3	0.1066	0.0000	OK
30 minute summer	S6	20	26.167	0.739	98.2	0.9017	0.0000	SURCHARGED
30 minute summer	S7	33	26.077	0.702	96.8	0.7942	0.0000	SURCHARGED
30 minute summer	ATTN	34	26.078	0.748	95.4	55.5196	0.0000	SURCHARGED
30 minute summer	S8_OUT	1	25.271	0.000	5.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	S1	SP1	S2	14.0	0.538	0.470	0.7599	
30 minute summer	S2	SP2	S3	22.1	0.572	0.736	0.5864	
30 minute summer	S3	SP3	S4	24.4	0.613	0.813	0.4837	
30 minute summer	S4_1	SP4_1	S4_2	16.0	1.469	0.212	0.1825	
30 minute summer	S4_2	SP4_2	S4	37.4	2.106	0.391	0.1721	
30 minute summer	S4	SP4	S5	50.9	1.279	1.703	1.1874	
30 minute summer	S5	SP5	S6	72.7	1.033	1.360	1.2557	
30 minute summer	S6_1	SP6_1	S6_2	20.3	1.567	0.123	0.2377	
30 minute summer	S6_2	SP6_2	S6_3	20.3	1.313	0.121	0.7553	
30 minute summer	S6_3	SP6_3	S6	20.0	1.105	0.194	0.3032	
30 minute summer	S6	SP6	S7	96.8	1.375	1.811	1.5861	
30 minute summer	S7	SP7	ATTN	95.4	1.355	1.786	1.3475	
30 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.7				70.9

Results for 100 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	S1	35	26.491	0.766	14.4	1.5607	0.0000	SURCHARGED
60 minute summer	S2	35	26.479	0.818	18.2	1.1864	0.0000	SURCHARGED
60 minute summer	S3	35	26.456	0.845	17.6	0.9558	0.0000	SURCHARGED
60 minute summer	S4_1	33	29.089	0.064	12.4	0.1226	0.0000	OK
60 minute summer	S4_2	33	27.794	0.094	29.0	0.1584	0.0000	OK
60 minute summer	S4	35	26.437	0.867	42.8	0.9807	0.0000	SURCHARGED
60 minute summer	S5	60	26.248	0.778	61.2	1.2024	0.0000	SURCHARGED
60 minute summer	S6_1	33	29.715	0.065	15.8	0.1341	0.0000	OK
60 minute summer	S6_2	33	29.312	0.062	15.8	0.0698	0.0000	OK
60 minute summer	S6_3	33	28.238	0.082	15.8	0.0933	0.0000	OK
60 minute summer	S6	61	26.248	0.820	79.8	1.0008	0.0000	SURCHARGED
60 minute summer	S7	62	26.247	0.872	78.7	0.9859	0.0000	SURCHARGED
60 minute summer	ATTN	62	26.247	0.917	77.6	68.1581	0.0000	SURCHARGED
60 minute summer	S8_OUT	1	25.271	0.000	6.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	S1	SP1	S2	11.5	0.522	0.384	0.7599	
60 minute summer	S2	SP2	S3	17.6	0.564	0.584	0.5864	
60 minute summer	S3	SP3	S4	18.0	0.454	0.602	0.4837	
60 minute summer	S4_1	SP4_1	S4_2	12.4	1.373	0.165	0.1514	
60 minute summer	S4_2	SP4_2	S4	29.0	1.986	0.303	0.1416	
60 minute summer	S4	SP4	S5	41.8	1.052	1.400	1.1874	
60 minute summer	S5	SP5	S6	59.7	0.848	1.117	1.2557	
60 minute summer	S6_1	SP6_1	S6_2	15.8	1.462	0.096	0.1980	
60 minute summer	S6_2	SP6_2	S6_3	15.8	1.221	0.094	0.6292	
60 minute summer	S6_3	SP6_3	S6	15.6	1.034	0.152	0.2530	
60 minute summer	S6	SP6	S7	78.7	1.117	1.472	1.5861	
60 minute summer	S7	SP7	ATTN	77.6	1.101	1.451	1.3475	
60 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.2				85.5

Results for 100 year +20% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	S1	110	26.356	0.631	9.7	1.2852	0.0000	SURCHARGED
120 minute summer	S2	110	26.355	0.694	13.1	1.0077	0.0000	SURCHARGED
120 minute summer	S3	110	26.355	0.744	12.4	0.8418	0.0000	SURCHARGED
120 minute summer	S4_1	64	29.077	0.052	8.4	0.0999	0.0000	OK
120 minute summer	S4_2	64	27.775	0.075	19.6	0.1263	0.0000	OK
120 minute summer	S4	110	26.355	0.785	30.7	0.8880	0.0000	SURCHARGED
120 minute summer	S5	110	26.353	0.883	43.9	1.3647	0.0000	SURCHARGED
120 minute summer	S6_1	64	29.703	0.053	10.6	0.1095	0.0000	OK
120 minute summer	S6_2	64	29.301	0.051	10.6	0.0574	0.0000	OK
120 minute summer	S6_3	64	28.223	0.067	10.6	0.0759	0.0000	OK
120 minute summer	S6	110	26.353	0.925	56.5	1.1291	0.0000	SURCHARGED
120 minute summer	S7	110	26.352	0.977	55.7	1.1046	0.0000	SURCHARGED
120 minute summer	ATTN	108	26.351	1.021	54.9	75.9200	0.0000	SURCHARGED
120 minute summer	S8_OUT	2	25.271	0.000	6.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	S1	SP1	S2	8.2	0.497	0.274	0.7599	
120 minute summer	S2	SP2	S3	12.4	0.551	0.412	0.5864	
120 minute summer	S3	SP3	S4	12.0	0.388	0.400	0.4837	
120 minute summer	S4_1	SP4_1	S4_2	8.4	1.234	0.112	0.1141	
120 minute summer	S4_2	SP4_2	S4	19.6	1.803	0.205	0.1054	
120 minute summer	S4	SP4	S5	29.8	0.749	0.997	1.1874	
120 minute summer	S5	SP5	S6	42.8	0.607	0.800	1.2557	
120 minute summer	S6_1	SP6_1	S6_2	10.6	1.307	0.064	0.1487	
120 minute summer	S6_2	SP6_2	S6_3	10.6	1.090	0.063	0.4722	
120 minute summer	S6_3	SP6_3	S6	10.6	0.929	0.103	0.1903	
120 minute summer	S6	SP6	S7	55.7	0.791	1.041	1.5861	
120 minute summer	S7	SP7	ATTN	54.9	0.928	1.027	1.3475	
120 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.5				105.7

Results for 100 year +20% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	S1	140	26.405	0.680	7.4	1.3853	0.0000	SURCHARGED
180 minute summer	S2	140	26.404	0.743	10.3	1.0785	0.0000	SURCHARGED
180 minute summer	S3	140	26.404	0.793	9.5	0.8968	0.0000	SURCHARGED
180 minute summer	S4_1	96	29.070	0.045	6.4	0.0869	0.0000	OK
180 minute summer	S4_2	96	27.764	0.064	14.9	0.1084	0.0000	OK
180 minute summer	S4	140	26.404	0.834	23.9	0.9430	0.0000	SURCHARGED
180 minute summer	S5	140	26.403	0.933	34.0	1.4409	0.0000	SURCHARGED
180 minute summer	S6_1	96	29.696	0.046	8.1	0.0956	0.0000	OK
180 minute summer	S6_2	96	29.295	0.045	8.1	0.0504	0.0000	OK
180 minute summer	S6_3	96	28.214	0.058	8.1	0.0661	0.0000	OK
180 minute summer	S6	140	26.402	0.974	43.8	1.1896	0.0000	SURCHARGED
180 minute summer	S7	140	26.401	1.026	43.2	1.1609	0.0000	SURCHARGED
180 minute summer	ATTN	140	26.401	1.071	42.6	78.1634	0.0000	SURCHARGED
180 minute summer	S8_OUT	4	25.271	0.000	6.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	S1	SP1	S2	6.4	0.471	0.213	0.7599	
180 minute summer	S2	SP2	S3	9.5	0.544	0.317	0.5864	
180 minute summer	S3	SP3	S4	9.0	0.391	0.299	0.4837	
180 minute summer	S4_1	SP4_1	S4_2	6.4	1.144	0.085	0.0938	
180 minute summer	S4_2	SP4_2	S4	14.9	1.681	0.156	0.0859	
180 minute summer	S4	SP4	S5	23.3	0.586	0.780	1.1874	
180 minute summer	S5	SP5	S6	33.2	0.510	0.621	1.2557	
180 minute summer	S6_1	SP6_1	S6_2	8.1	1.211	0.049	0.1226	
180 minute summer	S6_2	SP6_2	S6_3	8.1	1.012	0.048	0.3889	
180 minute summer	S6_3	SP6_3	S6	8.1	0.862	0.079	0.1570	
180 minute summer	S6	SP6	S7	43.2	0.613	0.808	1.5861	
180 minute summer	S7	SP7	ATTN	42.6	0.841	0.798	1.3475	
180 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.7				123.2

Results for 100 year +20% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	S1	176	26.436	0.711	6.3	1.4497	0.0000	SURCHARGED
240 minute summer	S2	176	26.436	0.775	8.6	1.1251	0.0000	SURCHARGED
240 minute summer	S3	176	26.436	0.825	7.9	0.9334	0.0000	SURCHARGED
240 minute summer	S4_1	124	29.067	0.042	5.5	0.0803	0.0000	OK
240 minute summer	S4_2	124	27.759	0.059	12.8	0.0996	0.0000	OK
240 minute summer	S4	176	26.436	0.866	20.1	0.9796	0.0000	SURCHARGED
240 minute summer	S5	176	26.434	0.964	28.7	1.4894	0.0000	SURCHARGED
240 minute summer	S6_1	124	29.693	0.043	6.9	0.0882	0.0000	OK
240 minute summer	S6_2	124	29.291	0.041	6.9	0.0465	0.0000	OK
240 minute summer	S6_3	124	28.209	0.053	6.8	0.0605	0.0000	OK
240 minute summer	S6	176	26.433	1.005	36.9	1.2276	0.0000	SURCHARGED
240 minute summer	S7	176	26.432	1.057	36.4	1.1957	0.0000	SURCHARGED
240 minute summer	ATTN	176	26.431	1.101	35.9	78.1980	0.0000	SURCHARGED
240 minute summer	S8_OUT	4	25.271	0.000	6.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	S1	SP1	S2	5.3	0.458	0.178	0.7599	
240 minute summer	S2	SP2	S3	7.9	0.541	0.263	0.5864	
240 minute summer	S3	SP3	S4	7.5	0.393	0.250	0.4837	
240 minute summer	S4_1	SP4_1	S4_2	5.5	1.093	0.073	0.0839	
240 minute summer	S4_2	SP4_2	S4	12.7	1.612	0.133	0.0766	
240 minute summer	S4	SP4	S5	19.5	0.556	0.654	1.1874	
240 minute summer	S5	SP5	S6	28.0	0.493	0.524	1.2557	
240 minute summer	S6_1	SP6_1	S6_2	6.9	1.156	0.042	0.1091	
240 minute summer	S6_2	SP6_2	S6_3	6.8	0.965	0.041	0.3434	
240 minute summer	S6_3	SP6_3	S6	6.8	0.819	0.066	0.1382	
240 minute summer	S6	SP6	S7	36.4	0.517	0.681	1.5861	
240 minute summer	S7	SP7	ATTN	35.9	0.754	0.672	1.3475	
240 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.8				139.3

Results for 100 year +20% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	S1	248	26.377	0.652	4.9	1.3292	0.0000	SURCHARGED
360 minute summer	S2	248	26.377	0.716	6.8	1.0391	0.0000	SURCHARGED
360 minute summer	S3	248	26.377	0.766	6.3	0.8663	0.0000	SURCHARGED
360 minute summer	S4_1	184	29.062	0.037	4.2	0.0702	0.0000	OK
360 minute summer	S4_2	184	27.751	0.051	9.9	0.0869	0.0000	OK
360 minute summer	S4	248	26.377	0.807	15.7	0.9125	0.0000	SURCHARGED
360 minute summer	S5	248	26.375	0.905	22.4	1.3987	0.0000	SURCHARGED
360 minute summer	S6_1	184	29.688	0.038	5.4	0.0782	0.0000	OK
360 minute summer	S6_2	184	29.287	0.037	5.4	0.0413	0.0000	OK
360 minute summer	S6_3	184	28.203	0.047	5.3	0.0533	0.0000	OK
360 minute summer	S6	248	26.375	0.947	28.8	1.1562	0.0000	SURCHARGED
360 minute summer	S7	248	26.374	0.999	28.4	1.1299	0.0000	SURCHARGED
360 minute summer	ATTN	248	26.373	1.043	28.0	77.5957	0.0000	SURCHARGED
360 minute summer	S8_OUT	8	25.271	0.000	6.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	S1	SP1	S2	4.2	0.438	0.140	0.7599	
360 minute summer	S2	SP2	S3	6.3	0.518	0.209	0.5864	
360 minute summer	S3	SP3	S4	5.9	0.374	0.196	0.4837	
360 minute summer	S4_1	SP4_1	S4_2	4.2	1.012	0.055	0.0692	
360 minute summer	S4_2	SP4_2	S4	9.9	1.507	0.103	0.0634	
360 minute summer	S4	SP4	S5	15.3	0.534	0.513	1.1874	
360 minute summer	S5	SP5	S6	21.9	0.480	0.410	1.2557	
360 minute summer	S6_1	SP6_1	S6_2	5.4	1.075	0.033	0.0917	
360 minute summer	S6_2	SP6_2	S6_3	5.3	0.899	0.032	0.2875	
360 minute summer	S6_3	SP6_3	S6	5.3	0.764	0.051	0.1156	
360 minute summer	S6	SP6	S7	28.4	0.469	0.531	1.5861	
360 minute summer	S7	SP7	ATTN	28.0	0.716	0.525	1.3475	
360 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.6				167.6

Results for 100 year +20% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	S1	312	26.352	0.627	3.9	1.2774	0.0000	SURCHARGED
480 minute summer	S2	312	26.352	0.691	5.5	1.0022	0.0000	SURCHARGED
480 minute summer	S3	312	26.352	0.741	5.2	0.8375	0.0000	SURCHARGED
480 minute summer	S4_1	248	29.058	0.033	3.4	0.0633	0.0000	OK
480 minute summer	S4_2	248	27.746	0.046	7.9	0.0774	0.0000	OK
480 minute summer	S4	312	26.351	0.781	12.8	0.8837	0.0000	SURCHARGED
480 minute summer	S5	312	26.350	0.880	18.2	1.3589	0.0000	SURCHARGED
480 minute summer	S6_1	248	29.684	0.034	4.3	0.0701	0.0000	OK
480 minute summer	S6_2	248	29.283	0.033	4.3	0.0374	0.0000	OK
480 minute summer	S6_3	248	28.199	0.043	4.3	0.0481	0.0000	OK
480 minute summer	S6	312	26.349	0.921	23.5	1.1246	0.0000	SURCHARGED
480 minute summer	S7	312	26.348	0.973	23.2	1.1004	0.0000	SURCHARGED
480 minute summer	ATTN	312	26.347	1.017	22.9	75.6357	0.0000	SURCHARGED
480 minute summer	S8_OUT	8	25.271	0.000	6.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	S1	SP1	S2	3.4	0.411	0.114	0.7599	
480 minute summer	S2	SP2	S3	5.2	0.510	0.172	0.5864	
480 minute summer	S3	SP3	S4	4.9	0.369	0.164	0.4837	
480 minute summer	S4_1	SP4_1	S4_2	3.4	0.954	0.045	0.0597	
480 minute summer	S4_2	SP4_2	S4	7.9	1.419	0.083	0.0540	
480 minute summer	S4	SP4	S5	12.5	0.517	0.420	1.1874	
480 minute summer	S5	SP5	S6	17.9	0.472	0.334	1.2557	
480 minute summer	S6_1	SP6_1	S6_2	4.3	1.006	0.026	0.0783	
480 minute summer	S6_2	SP6_2	S6_3	4.3	0.842	0.026	0.2474	
480 minute summer	S6_3	SP6_3	S6	4.3	0.720	0.042	0.0998	
480 minute summer	S6	SP6	S7	23.2	0.464	0.434	1.5861	
480 minute summer	S7	SP7	ATTN	22.9	0.644	0.429	1.3475	
480 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.5				187.7

Results for 100 year +20% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	S1	390	26.320	0.595	3.2	1.2133	0.0000	SURCHARGED
600 minute summer	S2	390	26.320	0.659	4.5	0.9566	0.0000	SURCHARGED
600 minute summer	S3	390	26.320	0.709	4.3	0.8020	0.0000	SURCHARGED
600 minute summer	S4_1	315	29.055	0.030	2.8	0.0576	0.0000	OK
600 minute summer	S4_2	315	27.741	0.041	6.5	0.0700	0.0000	OK
600 minute summer	S4	390	26.320	0.750	10.6	0.8482	0.0000	SURCHARGED
600 minute summer	S5	390	26.318	0.848	15.0	1.3109	0.0000	SURCHARGED
600 minute summer	S6_1	315	29.681	0.031	3.5	0.0634	0.0000	OK
600 minute summer	S6_2	315	29.280	0.030	3.5	0.0338	0.0000	OK
600 minute summer	S6_3	315	28.194	0.038	3.5	0.0435	0.0000	OK
600 minute summer	S6	390	26.318	0.890	19.4	1.0867	0.0000	SURCHARGED
600 minute summer	S7	390	26.317	0.942	19.1	1.0656	0.0000	SURCHARGED
600 minute summer	ATTN	390	26.316	0.986	18.9	73.3509	0.0000	SURCHARGED
600 minute summer	S8_OUT	15	25.271	0.000	6.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	S1	SP1	S2	2.8	0.400	0.095	0.7599	
600 minute summer	S2	SP2	S3	4.3	0.487	0.142	0.5864	
600 minute summer	S3	SP3	S4	4.1	0.355	0.135	0.4837	
600 minute summer	S4_1	SP4_1	S4_2	2.8	0.902	0.037	0.0521	
600 minute summer	S4_2	SP4_2	S4	6.5	1.343	0.068	0.0469	
600 minute summer	S4	SP4	S5	10.3	0.505	0.346	1.1874	
600 minute summer	S5	SP5	S6	14.8	0.457	0.276	1.2557	
600 minute summer	S6_1	SP6_1	S6_2	3.5	0.946	0.021	0.0678	
600 minute summer	S6_2	SP6_2	S6_3	3.5	0.795	0.021	0.2138	
600 minute summer	S6_3	SP6_3	S6	3.5	0.678	0.034	0.0863	
600 minute summer	S6	SP6	S7	19.1	0.458	0.358	1.5861	
600 minute summer	S7	SP7	ATTN	18.9	0.589	0.354	1.3475	
600 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.4				202.8

Results for 100 year +20% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	S1	450	26.280	0.555	2.9	1.1307	0.0000	SURCHARGED
720 minute summer	S2	450	26.280	0.619	4.1	0.8978	0.0000	SURCHARGED
720 minute summer	S3	450	26.280	0.669	3.8	0.7561	0.0000	SURCHARGED
720 minute summer	S4_1	375	29.053	0.028	2.5	0.0545	0.0000	OK
720 minute summer	S4_2	375	27.739	0.039	5.9	0.0666	0.0000	OK
720 minute summer	S4	450	26.279	0.709	9.6	0.8023	0.0000	SURCHARGED
720 minute summer	S5	450	26.278	0.808	13.6	1.2476	0.0000	SURCHARGED
720 minute summer	S6_1	375	29.679	0.029	3.2	0.0607	0.0000	OK
720 minute summer	S6_2	375	29.279	0.029	3.2	0.0324	0.0000	OK
720 minute summer	S6_3	375	28.193	0.037	3.2	0.0416	0.0000	OK
720 minute summer	S6	450	26.277	0.849	17.5	1.0366	0.0000	SURCHARGED
720 minute summer	S7	450	26.276	0.901	17.3	1.0189	0.0000	SURCHARGED
720 minute summer	ATTN	450	26.275	0.945	17.2	70.2539	0.0000	SURCHARGED
720 minute summer	S8_OUT	15	25.271	0.000	6.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	S1	SP1	S2	2.6	0.391	0.086	0.7599	
720 minute summer	S2	SP2	S3	3.8	0.483	0.128	0.5864	
720 minute summer	S3	SP3	S4	3.7	0.354	0.122	0.4837	
720 minute summer	S4_1	SP4_1	S4_2	2.5	0.871	0.033	0.0481	
720 minute summer	S4_2	SP4_2	S4	5.9	1.307	0.062	0.0437	
720 minute summer	S4	SP4	S5	9.4	0.492	0.314	1.1874	
720 minute summer	S5	SP5	S6	13.3	0.461	0.249	1.2557	
720 minute summer	S6_1	SP6_1	S6_2	3.2	0.922	0.019	0.0636	
720 minute summer	S6_2	SP6_2	S6_3	3.2	0.775	0.019	0.2007	
720 minute summer	S6_3	SP6_3	S6	3.2	0.660	0.031	0.0811	
720 minute summer	S6	SP6	S7	17.3	0.454	0.324	1.5861	
720 minute summer	S7	SP7	ATTN	17.2	0.576	0.321	1.3475	
720 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.3				214.3

Results for 100 year +20% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	S1	585	26.208	0.483	2.4	0.9837	0.0000	SURCHARGED
960 minute summer	S2	585	26.208	0.547	3.3	0.7931	0.0000	SURCHARGED
960 minute summer	S3	585	26.207	0.596	3.2	0.6746	0.0000	SURCHARGED
960 minute summer	S4_1	495	29.051	0.026	2.1	0.0501	0.0000	OK
960 minute summer	S4_2	495	27.736	0.036	4.9	0.0606	0.0000	OK
960 minute summer	S4	585	26.207	0.637	7.8	0.7208	0.0000	SURCHARGED
960 minute summer	S5	585	26.206	0.736	11.2	1.1366	0.0000	SURCHARGED
960 minute summer	S6_1	495	29.677	0.027	2.6	0.0551	0.0000	OK
960 minute summer	S6_2	495	29.276	0.026	2.6	0.0294	0.0000	OK
960 minute summer	S6_3	495	28.189	0.033	2.6	0.0377	0.0000	OK
960 minute summer	S6	585	26.205	0.777	14.4	0.9489	0.0000	SURCHARGED
960 minute summer	S7	585	26.204	0.829	14.2	0.9378	0.0000	SURCHARGED
960 minute summer	ATTN	585	26.203	0.873	14.1	64.9049	0.0000	SURCHARGED
960 minute summer	S8_OUT	15	25.271	0.000	6.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	S1	SP1	S2	2.1	0.377	0.070	0.7599	
960 minute summer	S2	SP2	S3	3.2	0.470	0.106	0.5864	
960 minute summer	S3	SP3	S4	2.9	0.342	0.098	0.4837	
960 minute summer	S4_1	SP4_1	S4_2	2.1	0.827	0.028	0.0426	
960 minute summer	S4_2	SP4_2	S4	4.9	1.242	0.051	0.0382	
960 minute summer	S4	SP4	S5	7.7	0.487	0.257	1.1874	
960 minute summer	S5	SP5	S6	11.0	0.454	0.206	1.2557	
960 minute summer	S6_1	SP6_1	S6_2	2.6	0.869	0.016	0.0549	
960 minute summer	S6_2	SP6_2	S6_3	2.6	0.725	0.015	0.1731	
960 minute summer	S6_3	SP6_3	S6	2.6	0.621	0.025	0.0700	
960 minute summer	S6	SP6	S7	14.2	0.449	0.267	1.5861	
960 minute summer	S7	SP7	ATTN	14.1	0.541	0.264	1.3475	
960 minute summer	ATTN	Hydro-Brake®	S8_OUT	6.1				233.2

Results for 100 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	S1	870	26.072	0.347	1.8	0.7075	0.0000	SURCHARGED
1440 minute summer	S2	870	26.072	0.411	2.7	0.5965	0.0000	SURCHARGED
1440 minute summer	S3	870	26.072	0.461	2.4	0.5214	0.0000	SURCHARGED
1440 minute summer	S4_1	750	29.047	0.022	1.5	0.0426	0.0000	OK
1440 minute summer	S4_2	750	27.731	0.031	3.6	0.0520	0.0000	OK
1440 minute summer	S4	870	26.072	0.502	5.6	0.5677	0.0000	SURCHARGED
1440 minute summer	S5	870	26.071	0.601	8.1	0.9282	0.0000	SURCHARGED
1440 minute summer	S6_1	750	29.674	0.024	2.0	0.0486	0.0000	OK
1440 minute summer	S6_2	750	29.273	0.023	2.0	0.0260	0.0000	OK
1440 minute summer	S6_3	750	28.185	0.029	2.0	0.0332	0.0000	OK
1440 minute summer	S6	870	26.070	0.642	10.6	0.7845	0.0000	SURCHARGED
1440 minute summer	S7	870	26.070	0.695	10.5	0.7858	0.0000	SURCHARGED
1440 minute summer	ATTN	870	26.069	0.739	10.4	54.8866	0.0000	SURCHARGED
1440 minute summer	S8_OUT	30	25.271	0.000	5.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	S1	SP1	S2	1.8	0.333	0.060	0.7599	
1440 minute summer	S2	SP2	S3	2.4	0.444	0.079	0.5864	
1440 minute summer	S3	SP3	S4	2.3	0.325	0.076	0.4837	
1440 minute summer	S4_1	SP4_1	S4_2	1.5	0.749	0.020	0.0336	
1440 minute summer	S4_2	SP4_2	S4	3.6	1.137	0.038	0.0307	
1440 minute summer	S4	SP4	S5	5.5	0.464	0.183	1.1874	
1440 minute summer	S5	SP5	S6	8.0	0.439	0.149	1.2557	
1440 minute summer	S6_1	SP6_1	S6_2	2.0	0.800	0.012	0.0458	
1440 minute summer	S6_2	SP6_2	S6_3	2.0	0.675	0.012	0.1441	
1440 minute summer	S6_3	SP6_3	S6	2.0	0.574	0.019	0.0582	
1440 minute summer	S6	SP6	S7	10.5	0.440	0.196	1.5861	
1440 minute summer	S7	SP7	ATTN	10.4	0.373	0.194	1.3475	
1440 minute summer	ATTN	Hydro-Brake®	S8_OUT	5.6				266.8

APPENDIX C

TYPICAL PIPE SPECIFICATIONS

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Agrément Certificate
02/H069
Product Sheet 1

JFC CORRIPIPE TWINWALL DRAINAGE SYSTEM

JFC CORRIPIPE TWINWALL HIGH-DENSITY POLYETHYLENE FILTER AND CARRIER PIPES AND COUPLINGS

This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers' Group and industry bodies. HAPAS Agrément Certificates are normally each subject to a review every five years.

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to JFC CorriPipe Twinwall High-Density Polyethylene Filter and Carrier Pipes and Couplings, in a range of sizes for use in highway drainage for the collection and disposal of surface and sub-surface water.



AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five-yearly review.

KEY FACTORS ASSESSED

Strength — the fittings have adequate strength to resist loads associated with installation and service (see section 5).

Performance of joints — the system will remain watertight under normal service conditions (see section 6).

Durability — the system will have a service life in excess of 50 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Brian Chamberlain
Head of Approvals — Engineering

Greg Cooper
Chief Executive

Date of First issue: 18 July 2011

Originally certificated on 28 March 2002 (150 mm, 225 mm and 300 mm) and on 23 December 2005 (375 mm, 450 mm and 600 mm).

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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HAPAS Requirements

Requirements

The general requirements for drains are contained in the Manual of Contract Documents for Highway Works (MCHW), Volume 1.

The general requirements for structural wall pipes and fittings are contained in the MCHW, Volume 1, Clause 518.

Further information and guidance is given in the MCHW, Volume 2 and Volume 3 (Drawing Numbers F1 and F2).

Additional site requirements may be included on particular contracts.

Regulations

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3), 2 Delivery and site handling (2.1), 3 General and 11 General of the Installation part of this Certificate.

General

This Certificate relates to JFC CorriPipe Twinwall 150 mm, 225 mm, 300 mm, 375 mm, 450 mm and 600 mm High-Density Polyethylene Filter and Carrier Pipes and Couplings.

The system is for use in highway drainage for the collection and disposal of surface and sub-surface water in accordance with Highways Agency (HA) requirements, *Manual of Contract Documents for Highway Works (MCHW)*, Volume 1, Clause 518, and Volume 2, and the conditions set out in the *Design Considerations and Installation* parts of this Certificate.

Technical Specification

1 Description

1.1 JFC CorriPipe Twinwall 150 mm, 225 mm, 300 mm, 375 mm, 450 mm and 600 mm Diameter High-Density Polyethylene Filter and Carrier Pipes and Couplings are manufactured from a blended, black polyethylene by a twin extrusion process. The two high-density polyethylene pipes are extruded simultaneously, one inside the other, and heatwelded together in one continuous process.

1.2 The products tested and covered by this Certificate are manufactured from material with the specification given in Table 1.

Table 1 Material properties/specification

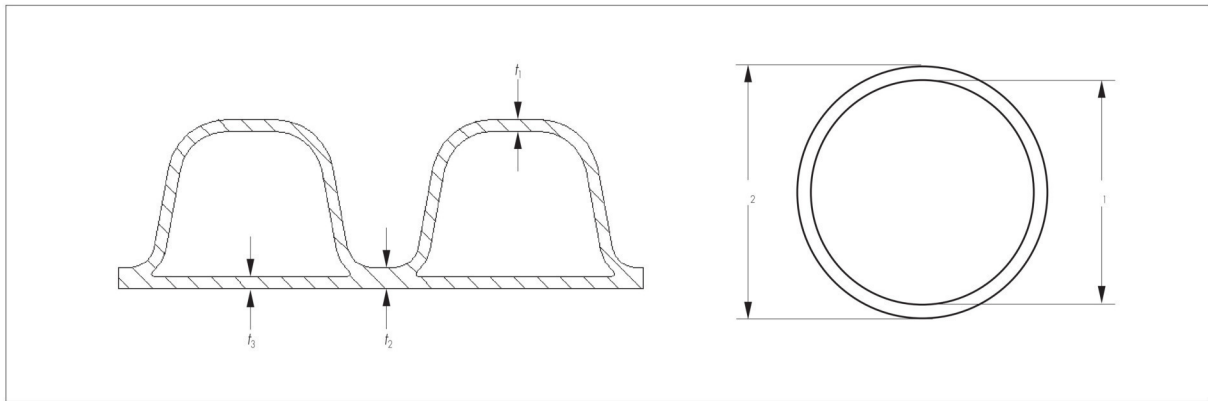
Property	Test method reference	Specification
Tensile properties	EN 638, ISO 527-2	≥18 MPa
Oxygen induction time	EN 728	≥4 mins
Melt flow rate	ISO 1133	≤0.75 g (10 mins) 2.16 kg at 190°C
Density	ISO 1183-3	≥935 kg·m ⁻³
Heat reversion	ISO 12091	N/A

1.3 The outer wall is corrugated and the inner wall is smooth finished. Details and dimensions are given in Table 2 and Figure 1.

Table 2 Pipe dimensions

Nominal internal pipe diameter d_1 (mm)	External pipe diameter d_2 (mm)	t_1 min (mm)	t_2 min (mm)	t_3 min (mm)	Nominal length (m)	Nominal weight (kg·m ⁻¹)	Pitch (mm)
150	178 ± 1.5	0.8	1.8	1.0	6	1.4	20.0
225	265 ± 2	0.9	2.6	1.2	6	3.0	25.5
300	354 ± 2.5	1.2	3.0	1.5	6	5.0	31.0
375	426 ± 3	1.5	3.5	1.5	6	6.0	39.9
450	512 ± 3	1.8	4.0	1.5	6	8.5	50.1
600	680 ± 4	2.1	4.3	1.8	6	14.5	66.9

Figure 1 Twinwall pipe



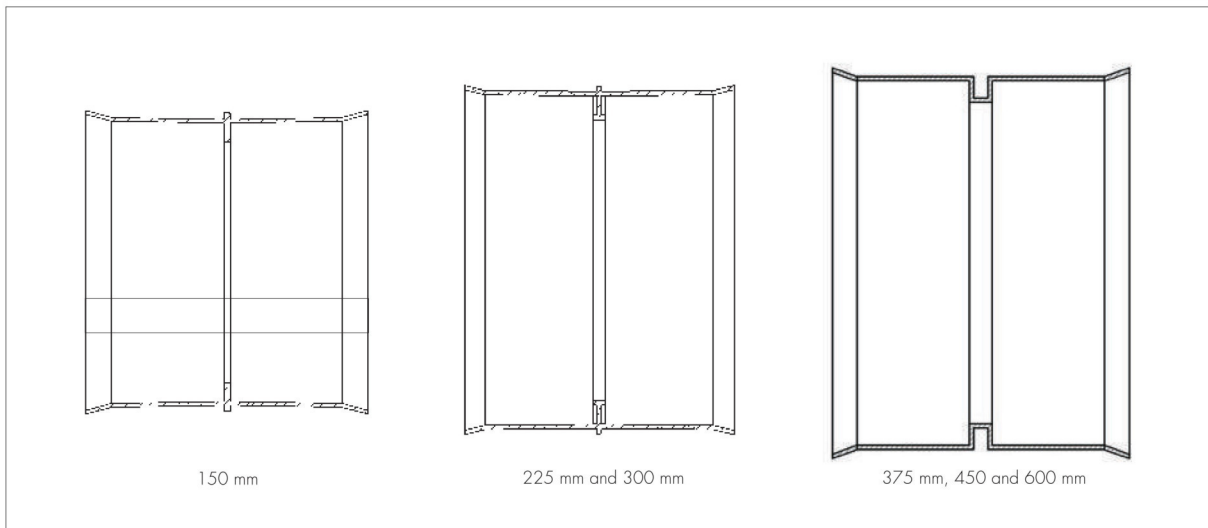
1.4 Black polypropylene couplings are available for the 150 mm, 225 mm and 300 mm sizes of pipe and black polyethylene for the 375 mm, 450 mm and 600 mm sizes (see Table 3 and Figure 2).

Table 3 Coupling dimensions

Nominal internal/external pipe diameter (mm)	Internal diameter		Nominal length (mm)	Nominal seal height (mm)
	at first dwell (mm)	at second dwell (mm)		
150/178	178	179	180	17.0
225/265	268	269	220	25.5
300/354	356	356.5	245	32.0
375/426	429	429	321	32.5
450/512	514	514	390	36.9
600/680	686	686	675	49.0

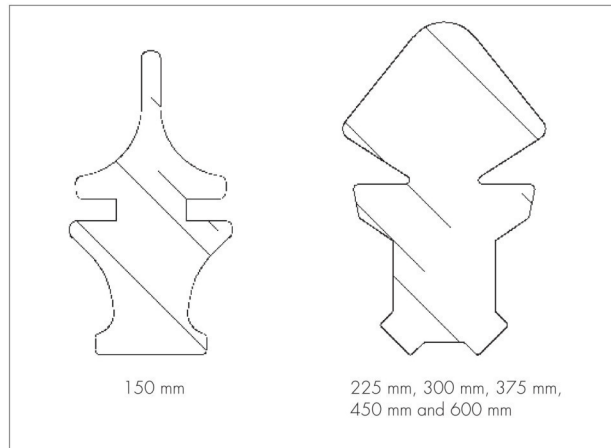
(1) Tapered along coupling length.

Figure 2 Couplings



1.5 Each coupling requires two rubber seals which are manufactured to BS EN 681-1 : 1996 (see Figure 3). The seals must be fitted in accordance with the installation instructions to ensure a watertight joint.

Figure 3 Seals

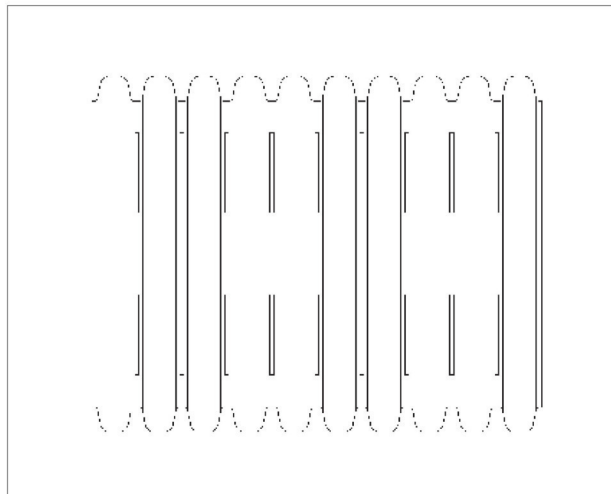


1.6 Pipes can be supplied either slotted or unslotted. Slotted pipe is available with the slots in the dwell between corrugations equally spaced around the circumference (see Table 4 and Figure 4).

Table 4 Slotted pipe details

Internal pipe diameter (nominal) (mm)	No of slots per alternate dwell	No of dwells per metre	Slot length (mm)	Slot width (mm)	Permeable area (minimum) (mm ² .m ⁻¹)
150	4	51	15 to 20	2.0 to 2.5	6120
225	4	39	15 to 30	2.0 to 2.5	4680
300	4	32	20 to 40	2.0 to 2.5	5120
375	3	25	42 to 85	2.7 to 3.3	4263
450	3	20	48 to 85	2.8 to 3.5	4024
600	3	15	76 to 106	2.9 to 3.5	4942

Figure 4 Details of slots (optional)



1.7 Continuous quality control is exercised during manufacture. Checks include:

Pipes

- dimensional accuracy
- impact resistance
- short-term stiffness

Couplings

- dimensional accuracy/visual check.

1.8 A label bearing the BBA identification mark is attached to each pipe length and fitting or to each pack of pipes.

2 Delivery and site handling

2.1 Handling, storage and transportation should be in accordance with BS 5955-6 : 1980.

2.2 When long-term storage is envisaged, JFC CorriPipe twinwall slotted and unslotted pipes and couplings should be protected from direct sunlight. If protection cannot be provided, consideration must be given to the effects of daily exposure to direct sunlight:

- up to 3 months — negligible UV degradation but possible extreme surface temperatures of up to 80°C may cause some localised distortion
- 3 months to 12 months — may have significant effect on the impact resistance and physical properties
- over 12 months — damage will occur unless protection provided.

2.3 The manufacturer has the option of adding chemicals to provide enhanced UV stability on request.

2.4 Pipes are generally delivered in prepacked bundles and should be retained in their packaging until installation.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on JFC CorriPipe Twinwall 150 mm, 225 mm, 300 mm, 375 mm, 450 mm and 600 mm Diameter High-Density Polyethylene Filter and Carrier Pipes and Couplings.

Design Considerations

3 General

JFC CorriPipe Twinwall 150 mm, 225 mm, 300 mm, 375 mm, 450 mm and 600 mm Diameter High-Density Polyethylene Filter and Carrier Pipes and Couplings comply with the requirements of the Highways Agency (HA) *Manual of Contract Documents for Highway Works* (MCHW), Volume 1, Clause 518.5 for pipe, Clause 518.6 for couplings and Clause 518.7 for the system, and is suitable for use in highways for the collection and disposal of surface and sub-surface water.

4 Practicability of installation

The pipes are installed using traditional drain-laying methods in accordance with HA requirements and the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8. Due to the lightweight nature of the pipe material, handling and jointing are easily performed.

5 Strength

5.1 The pipes have a ring stiffness in excess of 6 kN·m⁻², a creep ratio of less than 4 and adequate resistance to static loads.

5.2 The pipes have adequate resistance to impact loads to which they may be subjected during installation and in service.

6 Performance of joints

6.1 Joints on filter pipes made from pipe and couplings without the rubber seals are not partially watertight as defined in the MCHW, Volume 1, Clause 504.3.

6.2 Correctly made, the joints constructed from pipe and couplings with rubber seals remain watertight when subjected to deflection and distortion, and comply with the MCHW, Volume 1, Clauses 504.3 and 518.7 (see section 14).

7 Water infiltration

The slot area for the pipes exceeds the minimum requirement of 1000 mm² per metre length as given in the MCHW, Volume 1, Clause 518.3 (see Table 3).

8 Flow characteristics

8.1 The pipes will have normal flow characteristics associated with thermoplastics pipes.

8.2 Full-bore velocities are available from the *Tables for the Hydraulic Design of Pipes, Sewers and Channels*, Volume 2, 8th Edition, by H R Wallingford and D I H Barr. Appropriate values are based on the Colebrook-White equation. An appropriate value of roughness coefficient should be selected when designing the drainage system. For new pipes, a value of 0.006 is applicable, but for designs a value of 0.6 is generally used.

9 Maintenance

9.1 The slots are designed to restrict the ingress of silt into the drains.

9.2 Access to the system for cleaning should be provided by conventional methods.

9.3 The system can be rodded using flexible drain rods. In common with other standard plastic drainage systems, toothed root cutters and rods with metal ferrules, as used with some mechanical clearing systems, could damage the pipes and couplings and should not be used.

9.4 Tests indicate that the pipes have adequate resistance to cleansing using pressure jetting equipment (see section 13.1). It is recommended that low-pressure, high-volume systems are utilised in accordance with MCHW, Clause 520.

10 Durability

In the opinion of the BBA, the material from which the pipes and couplings are manufactured will not significantly deteriorate and the anticipated life of the system will be in excess of 50 years.

Installation

11 General

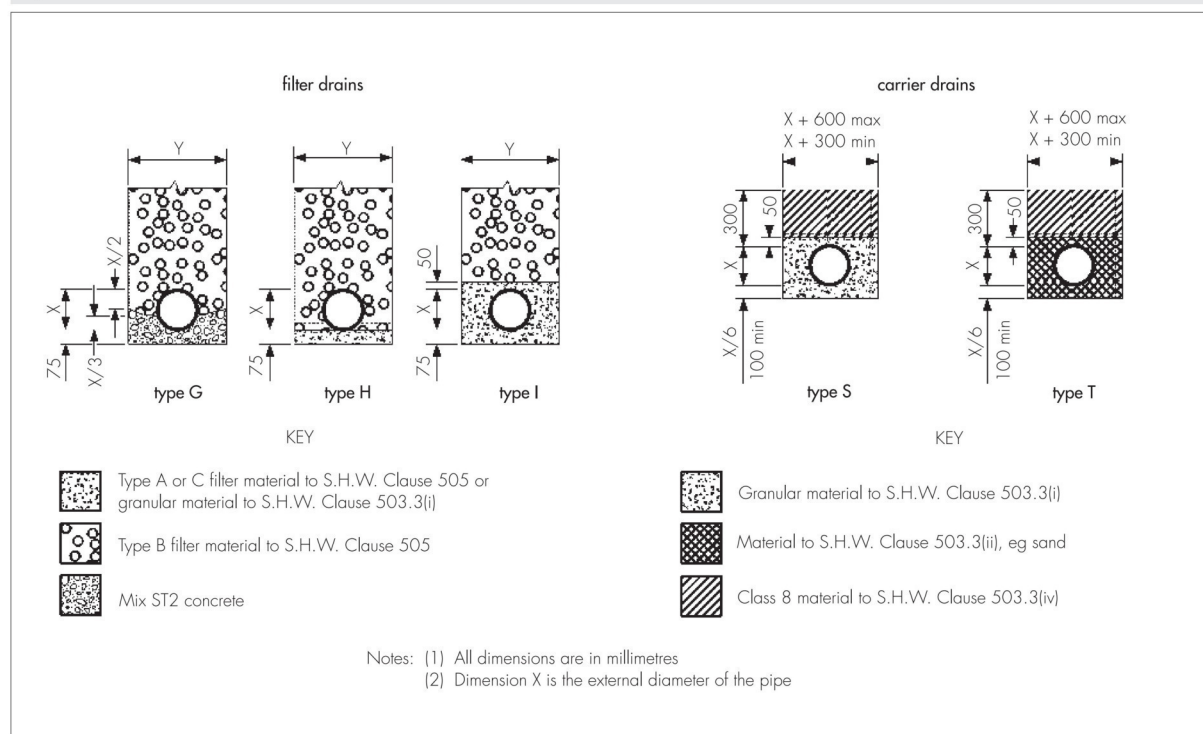
11.1 JFC CorriPipe Twinwall 150 mm, 225 mm, 300 mm, 375 mm, 450 mm and 600 mm Diameter High-Density Polyethylene Filter and Carrier Pipes and Couplings must be installed in accordance with HA requirements and the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8.

11.2 The pipes and couplings must be protected against damage from site construction traffic.

12 Procedures

12.1 For typical laying, trench and backfilling specification details, reference should be made to Figure 5 and the MCHW, Volume 3, Drawings No F1 (Type T and S) and No F2 (Type G, H and I).

Figure 5 Installation details



12.2 Pipes are cut easily using conventional hand tools, and should be cut square between the corrugations.

12.3 For a watertight joint, the pipe ends and coupling should be cleaned and the rubber seal fitted externally in the first or second dwell. The seal and inside of the coupling should be lubricated and the pipe pushed fully home to the central register either by hand, or using a lever if necessary.

12.4 Care should be taken during backfill to maintain the line and level of the pipeline. If necessary, the pipe should be restrained to prevent uplift.

13 Tests

13.1 Tests were carried out on the pipe in accordance with the MCHW, Volume 1, Clause 518.5 to determine:

- ring stiffness to BS EN ISO 9969 : 1995
- creep ratio to BS EN ISO 9967 : 1995
- longitudinal bending to the MCHW, Volume 1, Clause 518.11
- rodding resistance to the MCHW, Volume 1, Clause 518.12
- impact resistance at 0°C and 23°C to BS EN 1411 : 1996 with a striker of 1.0 kg mass and 25 mm diameter conical head
- water jetting WRc method.

13.2 Tests were carried out on the system to establish:

- leaktightness of joint to BS EN 1277 : 2003, Method 4, Conditions A, B and C
- insertion force (ease of jointing).

13.3 Tests were carried out to establish the dimensional accuracy of the pipe, coupling and ring seal.

14 Investigations

14.1 An examination was made of data in relation to the effect of the production tolerances on the performance of the products.

14.2 An evaluation of existing data was made to assess material properties, chemical resistance and durability.

14.3 Calculations were carried out to determine slot area.

14.4 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 5955-6 : 1980 *Plastics pipework (thermoplastics materials) — Code of practice for the installation of unplasticized PVC pipework for gravity drains and sewers*

BS EN 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*

BS EN 763 : 1995 *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Test method for visually assessing effects of heating*

BS EN 1277 : 2003 *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

BS EN 1411 : 1996 *Plastics piping and ducting systems — Thermoplastics pipes — Determination of resistance to external blows by the staircase method*

BS EN ISO 9967 : 1995 *Thermoplastics pipes — Determination of creep ratio*

BS EN ISO 9969 : 1995 *Thermoplastics pipes — Determination of ring stiffness*

EN 638 : 1994 *Plastics piping and ducting systems — Thermoplastics pipes — Determination of tensile properties*

EN 728 : 1997 *Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time*

ISO 527-2 : 1993 *Plastics — Determination of tensile properties — Test conditions for moulding and extrusion plastics*

ISO 1133 : 1997 *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

ISO 1183-3 : 1999 *Plastics — Methods for determining the density of non-cellular plastics — Gas pycnometer method*

ISO 4440-1 : 1994 *Thermoplastics pipes and fittings — Determination of melt mass-flow rate — Test method*

ISO 4451 : 1980 *Polyethylene (PE) pipes and fittings — Determination of reference density of uncoloured and black polyethylenes*

ISO 12091 : 1995 *Structural wall thermoplastics pipes — Oven test*

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, August 1998 (as amended)

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, August 1998 (as amended)

Manual of Contract Documents for Highway Works, Volume 3 Highway Construction Details, March 1998 (as amended)

Conditions of Certification

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

15.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate
- remain in accordance with the requirements of Highway Authorities' Product Approval Scheme.

15.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

15.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal.

15.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.



CorriPipe™ Technical Specification



www.jfc.ie

CorriPipe™ Technical Specification

1. Introduction

CorriPipe™ is a twin wall high density polyethylene pipe manufactured from a blended black polyethylene by a twin extrusion process.

Two high density polyethylene walls are extruded simultaneously, one inside the other, and heat-welded together in one continuous process. The outer wall is corrugated and the inner wall is smooth finished.

It is a combination of the corrugations, and the heat-welding of the two walls, that give CorriPipe™ its excellent structural strength while its smooth inner wall ensures increased flow capacity.

Its applications include surface and storm water drainage in civil engineering, construction, sports amenity, agricultural and other sub-soil applications.

CorriPipe™ is fully BBA (British Board of Agrément) approved and HAPAS (Highways Agency Product Approval Scheme) certified.



Figure 1. – CorriPipe™

2. Dimensions

CorriPipe™ comes in a complete range between 100mm and 600mm and is available in either carrier or filter pipe. CorriPipe™ also has a complete range of fittings and junctions as detailed below.

Nominal Size (mm)	Inside Diameter (mm)	Outside Diameter (mm)	Pipe Length (m)
94	94	110	6
150	149	176	6
225	221	265	6
300	295	354	6
375	370	426	6
450	445	512	6
600	590	680	6

Table 1. – CorriPipe™ Dimensions

Nominal Size (mm)	No. of slots per alternate dwell	Nom. Slot Width (mm)	Perforated Area (mm ² /m)
94	4	1.5	7920
150	4	2	6120
225	4	2	4680
300	4	2	5120
375	3	3	4263
450	3	3	4024
600	3	3	4942

Table 2. – Perforated Pipe Detail

Note: CorriPipe also available in various perforation specification. e.g. half perforated, double perforated.

Nominal Size (mm)	Code	Fitting Type
150	150TB30	30° Bend
150	150TB45	45° Bend
150	150TB90	90° Bend
150	150TT90	Equal Tee
150	150TY45	Equal Wye
150	150SWSTT90	Single Wall Tee
225	225TB30	30° Bend
225	225TB45	45° Bend
225	225TB90	90° Bend
225	225TT90	Equal Tee
225	225TY45	Equal Wye
225	225/150TT90	Unequal Tee 150
225	225/150TY45	Unequal Wye 150
225	225SWSTT90	Single Wall Tee
300	300TB30	30° Bend
300	300TB45	45° Bend
300	300TB90	90° Bend
300	300TT90	Equal Tee
300	300TY45	Equal Wye
300	300/150TT90	Unequal Tee 150
300	300/150TY45	Unequal Wye 150
300	300/225TT90	Unequal Tee 225
300	300/225TY45	Unequal Wye 225
300	300SWSTT90	Single Wall Tee

Table 3. – CorriPipe™ Fittings

Note: Larger fitting sizes fabricated on request

CorriPipe™ Technical Specification

3. Hydraulic Capacity

There are two main formulas used in hydraulic calculations of gravity flow pipelines – Manning's and Colebrook-White:

Manning's

Manning's is the most popular equation for stormwater design because it is simple to apply and it generally provides an acceptable level of accuracy.

$$Q = \frac{1}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$$

Q = Water Discharge [m³/s]

n = Manning's roughness factor [s/m^{1/3}]

A = Cross-sectional area [m²]

R = Hydraulic radius [m]

S = Surface Water Slope [m/m]

Colebrook-White

A more accurate method for calculations involving FRC™ pipes is to utilize the Colebrook-White formula. The Colebrook-White design chart for FRC™ should allow quick and easy estimates without involved calculations.

$$V = -2\sqrt{2gDS} \log\left(\frac{k}{3.7D} + \frac{2.51v}{d\sqrt{2gDS}}\right)$$

V = Velocity (m/s)

S = Hydraulic gradient (m/m)

k = Hydraulic roughness (m)

R = Hydraulic radius = D/4 (m)

D = Pipe internal diameter (m)

g = Gravitational acceleration (m/s²)

v = Kinematic viscosity of water (m²/s)

4. Cover Depths

Minimum Cover Depths

JFC Manufacturing Limited recommends the following minimum cover depths.

- 0.6m for non trafficked green areas
- 0.9m to finished surface for trafficked areas not subject to Highways Agency or National Roads Authority requirements
- 1.2m to finished surface for trafficked areas subject to Highways Agency or National Roads Authority requirements.

In certain circumstances lower minimum cover levels may be allowed. e.g. installation with rigid pavement, concrete surround etc. Please contact JFC for more information.

Maximum Cover Depths

The maximum cover depth for CorriPipe™ is normally between 6-10 meters when installed in accordance with series 500 of the MCDHW Volume 1 as detailed in the CorriPipe™ BBA certificate.

The actual maximum allowable cover level is dependent on the following installation parameters and is often well in excess of 6-10 meters:

- The native soil stiffness
- The pipe bed and surround stiffness
- The size of the trench
- The density of the overburden
- Hydrostatic loading
- Factor of Safety
- Maximum allowable deflection limit

For specific site conditions JFC can calculate the maximum pipe deflection based on the above parameters. Contact JFC for more details.

CorriPipe™ Technical Specification

4. Installation

JFC CorriPipe is to be installed in accordance with the following national guidelines. In countries outside that specified contact JFC for more details.

Ireland

The Manual of Contract Documents for Road Works, Volume 1 series 500, clauses 503 and 505 as published by the NRA.

United Kingdom

The Manual of Contract Documents for Highway Works, Volume 1 series 500, clauses 503, 505, 518.7 and 518.8 as published by the Highways Agency

Trench Preparation

The trench width is generally between OD+300mm and OD+600mm but larger trenches are permissible. The trench should provide for a minimum of 150mm pipe bed and local soft spots must be removed and replaced with hardcore. The pipe must sit evenly on the bed and must be free of voids under the pipe. The trench should not be excavated too far in advance of pipe installation. All trenches are to be excavated in accordance with national health and safety regulations and local building regulations.

Sidefill

CorriPipe™ is to be backfilled as described in the MCDHW, Volume 1, Series 500. Sidefill material is dependent on specification but is normally a well graded granular material or small single size aggregate. The pipe surround material must fully support the pipe. Compaction may be required depending on ground conditions and sidefill material used. If compaction is required the compaction equipment must not come in contact with the pipe. The sidefill material should extend to 100mm over the crown of the pipe.

Backfill

Backfill is to continue to a minimum of 300mm above the crown of the pipe with suitable material as per specification. The material should be free of any stone particles greater than 50mm. Compaction should not be carried out until a minimum cover of 300mm is achieved. Compaction equipment should be sized so as not to exert any undue stress in the pipe. Further backfill to the required level should be carried out in layer no greater than 300mm.

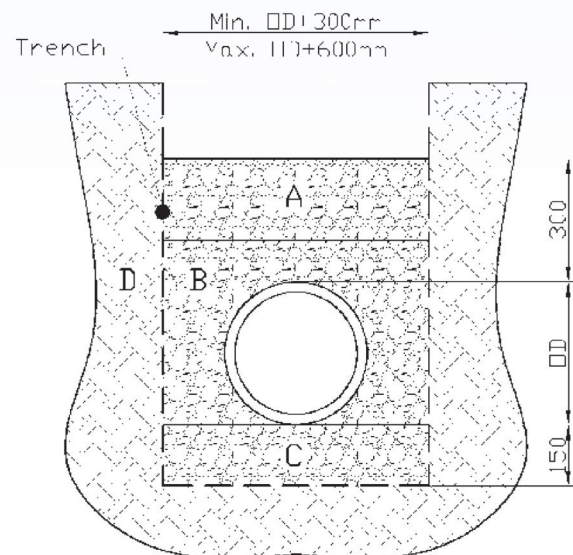


Figure 2. – Typical Installation Details

A = Backfill

B = Sidefill

C = Bed

D = Earth

OD = Outside Diameter of Pipe

CorriPipe™ Technical Specification

5. Jointing

CorriPipe™ is manufactured in 6 meter lengths and is joined with straight couplers or suitable fittings (e.g. tees, wyes, bends etc.)

CorriPipe™ provides a fully watertight seal when installed in accordance with JFC recommendations.

Leak tightness is in accordance with BS EN 1277:1997. The maximum permitted angular deflection is 2°.

Rubber seals used in watertight applications are in accordance with BS EN 681-1:1996

JFC recommends the following procedure for joining CorriPipe™ and associated fittings / couplers.

- Cut the pipe to the require length with a conventional handsaw.
- Clean the end of the pipe and accompanying coupler / fitting.
- Install a ring seal in the first dwell of the pipe for watertight joints.
- Ring seals are bi directional
- Lubricate the ring seal and accompanying coupler / fitting.
- Offer the fitting / coupler up to the pipe
- Lever the fitting / coupler onto the pipe with a piece of timber ensuring not to damage the pipe. Larger pipes may require mechanical assistance.
- Ensure the fitting / coupler is butted fully against the pipe.
- For joining pipes to the opposite side of the fitting / coupler follow the same steps as outlined above.

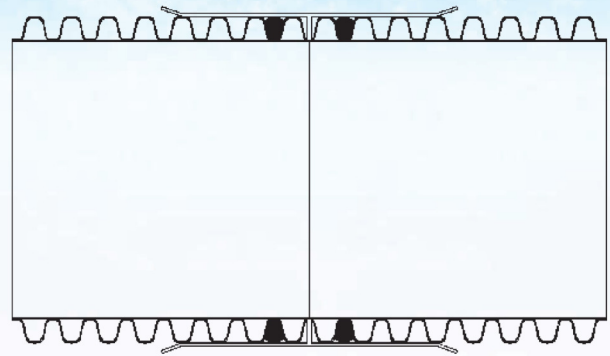


Figure 3. – Typical Joint Details

6. Pressure Testing

There are two methods of pressure testing, the air test method and the water test method. The most common method is the air test method and the test procedure is outlined below.

- Block the ends of the pipe / fitting with a suitable expanding stopper, ensuring both plug and pipe are cleaned prior to fitting.
- Fill a U-Tube manometer with water to the correct level, ensuring there are no trapped air bubbles in the water.
- Connect the u-tube to the fitting on the expandable stopper.
- Increase the pressure in the pipe until a head of water of 100mm is reached.
- Allow the pressure to stabilise for a number of minutes, increasing the pressure if it drops.
- Record the pressure drop over a five minute period.
- To pass the test the pressure should not drop below a 75mm head of water.

Note: Temperature has a critical effect on the test, a 1°C change in air temperature inside the pipe is sufficient for the test to fail.

CorriPipe™ Technical Specification

6. Transportation, Handling and Storage

General

Handling should be done carefully and in accordance with national health and safety guidelines. Dragging of pipes and fittings must be avoided. HDPE pipes and fittings become slippery in wet or in cold weather and extra precautions may be necessary.

Pipes up to 450mm in size are palletised with wooden frames and steel straps. 600mm pipes are generally steel banded in two's but can also be supplied loose.

Nominal Size (mm)	Number of Pipes per Pallet
100	100
150	33
225	14
300	8
375	5
450	4
600	2 / steel banded

Table 4. – CorriPipe™ Pallet Quantities

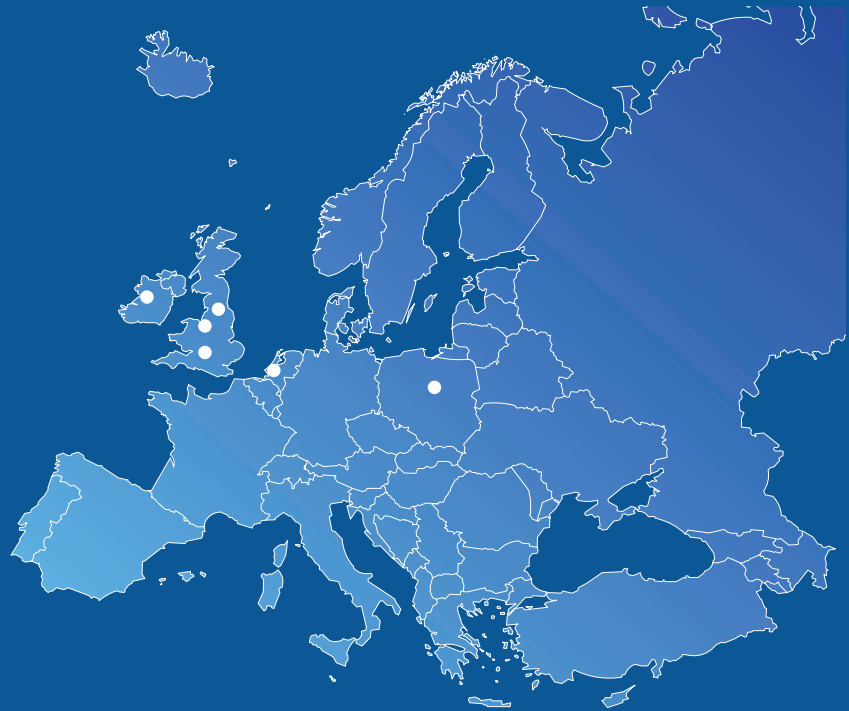
Storage

All materials should be carefully inspected at the time of delivery and any defects should be notified and reported immediately. All pipe stacks should be made on firm, flat ground to support the weight of the pipes and lifting equipment. For safety and Pipes and fittings should be transported and stored in their packaging.

Delivery vehicles should be provided with a clean, flat bed, free from sharp objects. Care must be taken to prevent slippage or excessive bowing of the pipes. Tie the load well to prevent rubbing. Use nylon straps, not chains or ropes.

The stacking height for pipes should be limited to not more than 3 meters. Pipes should be not be stored in open areas subject to high winds.

It is recommended that CorriPipe™ is not stored in direct sunlight for more than 3 months.



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APPENDIX D

Oil Interceptor Details

SEPARATORS

A RANGE OF FUEL/OIL SEPARATORS
FOR PEACE OF MIND



Klargester

The Klargester logo features a stylized blue wave graphic above the word "Klargester" in a red, italicized, sans-serif font.

60 YEARS OF
Expertise &
1955-2015 Innovation

A blue wave graphic is positioned below the text "1955-2015 Innovation".

Separators

A RANGE OF FUEL/OIL SEPARATORS FOR PEACE OF MIND

Surface water drains normally discharge to a watercourse or indirectly into underground waters (groundwater) via a soakaway. Contamination of surface water by oil, chemicals or suspended solids can cause these discharges to have a serious impact on the receiving water.

The Environment Regulators, Environment Agency, England and Wales, SEPA, Scottish Environmental Protection Agency in Scotland and Department of Environment & Heritage in Northern Ireland, have published guidance on surface water disposal, which offers a range of means of dealing with pollution both at source and at the point of discharge from site (so called 'end of pipe' treatment). These techniques are known as 'Sustainable Drainage Systems' (SuDS).

Where run-off is draining from relatively low risk areas such as car-parks and non-operational areas, a source control approach, such as permeable surfaces or infiltration trenches, may offer a suitable means of treatment, removing the need for a separator.

Oil separators are installed on surface water drainage systems to protect receiving waters from pollution by oil, which may be present due to minor leaks from vehicles and plant, from accidental spillage.

Effluent from industrial processes and vehicle washing should normally be discharged to the foul sewer (subject to the approval of the sewerage undertaker) for further treatment at a municipal treatment works.

SEPARATOR STANDARDS AND TYPES

A British (and European) standard (EN 858-1 and 858-2) for the design and use of prefabricated oil separators has been adopted. New prefabricated separators should comply with the standard.

SEPARATOR CLASSES

The standard refers to two 'classes' of separator, based on performance under standard test conditions.

CLASS I

Designed to achieve a concentration of less than 5mg/l of oil under standard test conditions, should be used when the separator is required to remove very small oil droplets.

CLASS II

Designed to achieve a concentration of less than 100mg/l oil under standard test conditions and are suitable for dealing with discharges where a lower quality requirement applies (for example where the effluent passes to foul sewer).

Both classes can be produced as full retention separators. The oil concentration limits of 5 mg/l and 100 mg/l are only applicable under standard test conditions. It should not be expected that separators will comply with these limits when operating under field conditions.

FULL RETENTION SEPARATORS

Full retention separators treat the full flow that can be delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

On large sites, some short term flooding may be an acceptable means of limiting the flow rate and hence the size of full retention systems.

Get in touch for a **FREE** professional site visit and a representative will contact you within 5 working days to arrange a visit.

helpingyou@klargester.com to make the right decision or call **028 302 66799**

BYPASS SEPARATORS

Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

FORECOURT SEPARATORS

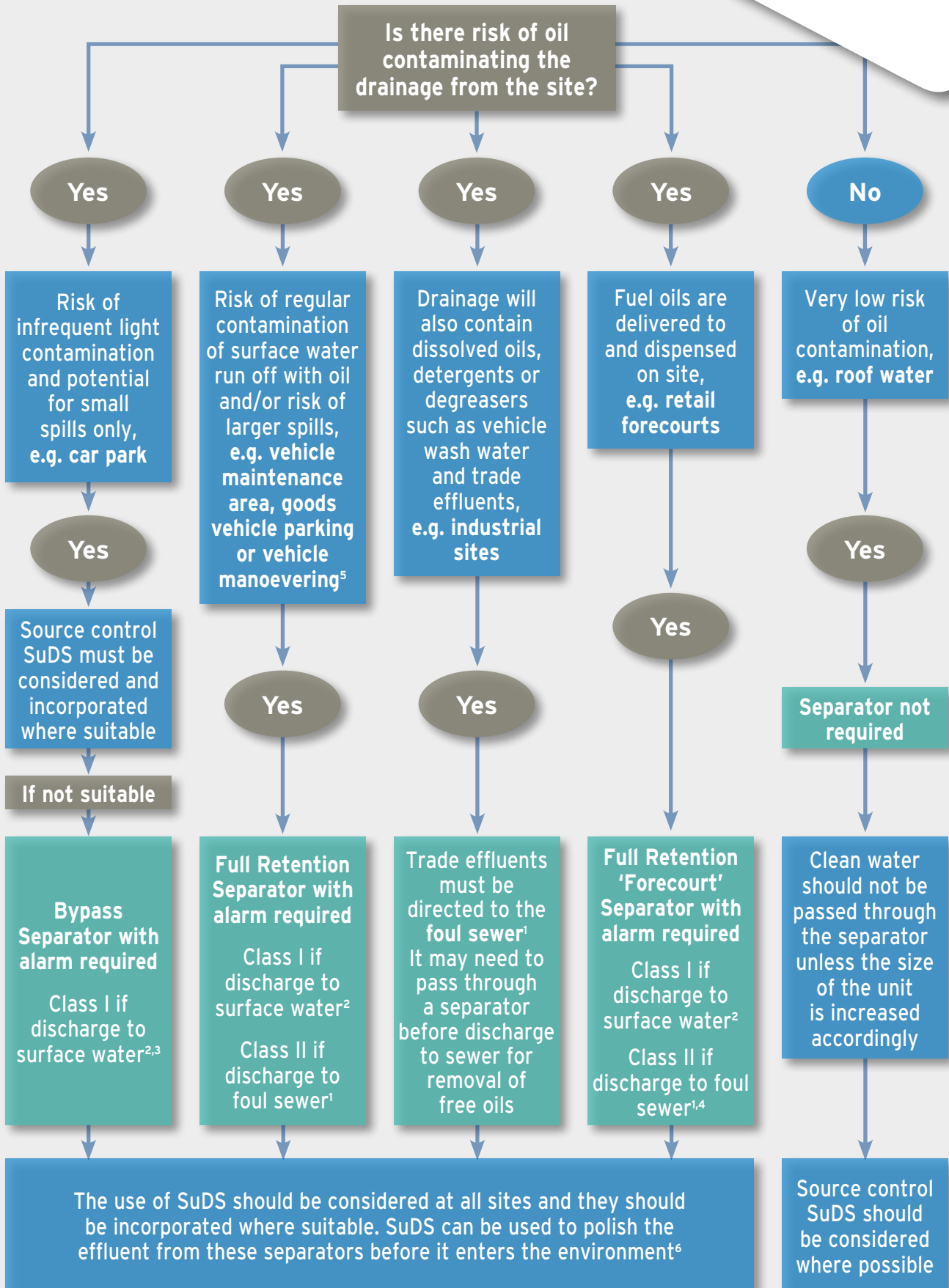
Forecourt separators are full retention separators specified to retain on site the maximum spillage likely to occur on a petrol filling station. They are required for both safety and environmental reasons and will treat spillages occurring during vehicle refuelling and road tanker delivery. The size of the separator is increased in order to retain the possible loss of the contents of one compartment of a road tanker, which may be up to 7,600 litres.

SELECTING THE RIGHT SEPARATOR

The chart on the following page gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways.

For further detailed information, please consult the Environment Agency Pollution Prevention Guideline 03 (PPG 3) 'Use and design of oil separators in surface water drainage systems' available from their website.

Kingspan Klargester has a specialist team who provide technical assistance in selecting the appropriate separator for your application.



1 You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
 2 You must seek prior permission from the relevant environmental body before you decide which separator to install.
 3 In this case, if it is considered that there is a low risk of pollution a source control SuDS scheme may be appropriate.
 4 In certain circumstances, the sewer provider may require a Class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.
 5 Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.
 6 In certain circumstances, a separator may be one of the devices used in the SuDS scheme. Ask us for advice.

Bypass NSB RANGE

APPLICATION

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

PERFORMANCE

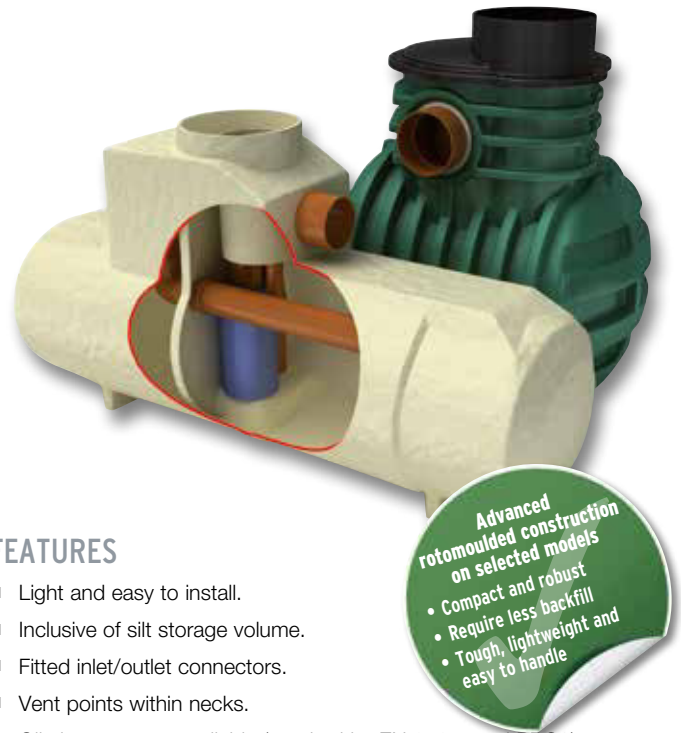
Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Oil storage volume.
- Silt storage capacity.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 $NSB = 0.0018A(m^2)$. Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.



FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped.
- The drain invert inlet depth.
- Pipework type, size and orientation.

SIZES AND SPECIFICATIONS

UNIT NOMINAL SIZE	FLOW (l/s)	PEAK FLOW RATE (l/s)	DRAINAGE AREA (m ²)	STORAGE CAPACITY (litres)		UNIT LENGTH (mm)	UNIT DIA. (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT (mm)	STANDARD FALL ACROSS (mm)	MIN. INLET INVERT (mm)	STANDARD PIPEWORK DIA.
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

■ Rotomoulded chamber construction ■ GRP chamber construction * Some units have more than one access shaft – diameter of largest shown.

Full Retention NSF RANGE

APPLICATION

Full retention separators are used in high risk spillage areas such as:

- Fuel distribution depots.
- Vehicle workshops.
- Scrap Yards

PERFORMANCE

Kingspan Klargester were the first UK manufacturer to have the required range (3-30 l/sec) certified to EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates.

The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they met the effluent quality requirements of EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Silt storage capacity.
- Automatic closure device.
- Oil storage volume.
- Coalescer (Class I units only).

Klargester full retention separators treat the whole of the specified flow.

FEATURES

- Light and easy to install.
- Class I and Class II designs.
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.



- Oil alarm system available.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size full retention separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped.
- The required discharge standard. This will decide whether a Class I or Class II unit is required.
- The drain invert inlet depth.
- Pipework type, size and orientation.

SIZES AND SPECIFICATIONS

UNIT NOMINAL SIZE	FLOW (l/s)	DRAINAGE AREA (m ² PPG-3 (0.018))	STORAGE CAPACITY (litres)		UNIT LENGTH (mm)	UNIT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT	MIN. INLET INLET (mm)	STANDARD PIPEWORK DIA. (mm)
			SILT	OIL						
NSFP003	3	170	300	30	1700	1350	1420	1345	500	160
NSFP006	6	335	600	60	1700	1350	1420	1345	500	160
NSFA010	10	555	1000	100	2610	1225	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	1050	1000	500	200
NSFA020	20	1115	2000	200	3200	2010	1810	1760	1000	315
NSFA030	30	1670	3000	300	3915	2010	1810	1760	1000	315
NSFA040	40	2225	4000	400	4640	2010	1810	1760	1000	315
NSFA050	50	2780	5000	500	5425	2010	1810	1760	1000	315
NSFA065	65	3610	6500	650	6850	2010	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	2500	2450	1000	300
NSFA100	100	5560	10000	1000	6200	2820	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	2550	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	2550	2450	1000	525
NSFA200	200	11110	20000	2000	11280	2820	2550	2450	1000	600

■ Rotomoulded chamber construction ■ GRP chamber construction

Washdown & Silt

APPLICATION

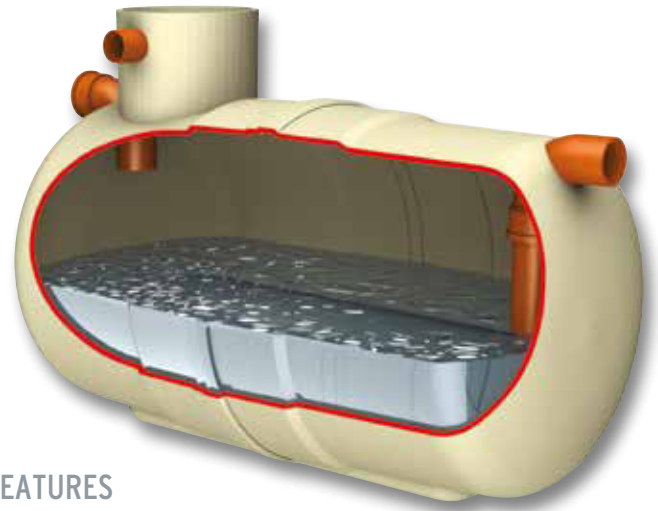
This unit can be used in areas such as car wash and other cleaning facilities that discharge directly into a foul drain, which feeds to a municipal treatment facility.

If emulsifiers are present the discharge must not be allowed to enter an NS Class I or Class II unit.

- Car wash.
- Tool hire depots.
- Truck cleansing.
- Construction compounds cleansing points.

PERFORMANCE

Such wash down facilities must not be allowed to discharge directly into surface water but must be directed to a foul connection leading to a municipal treatment works as they utilise emulsifiers, soaps and detergents, which can dissolve and disperse the oils.



FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.

SIZES AND SPECIFICATIONS

REF.	TOTAL CAPACITY (litres)	MAX. REC. SILT	MAX. FLOW RATE (l/s)	LENGTH (mm)	DIAMETER (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT (mm)	STANDARD FALL ACROSS UNIT (mm)	MIN. INLET INVERT (mm)	STANDARD PIPEWORK DIA. (mm)	APPROX EMPTY (kg)
W1/010	1000	500	3	1123	1225	460	1150	1100	50	500	160	60
W1/020	2000	1000	5	2074	1225	460	1150	1100	50	500	160	120
W1/030	3000	1500	8	2952	1225	460	1150	1100	50	500	160	150
W1/040	4000	2000	11	3898	1225	460	1150	1100	50	500	160	180
W1/060	6000	3000	16	4530	1440	600	1360	1310	50	500	160	320
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160	585
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160	680
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160	770
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160	965
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160	1200

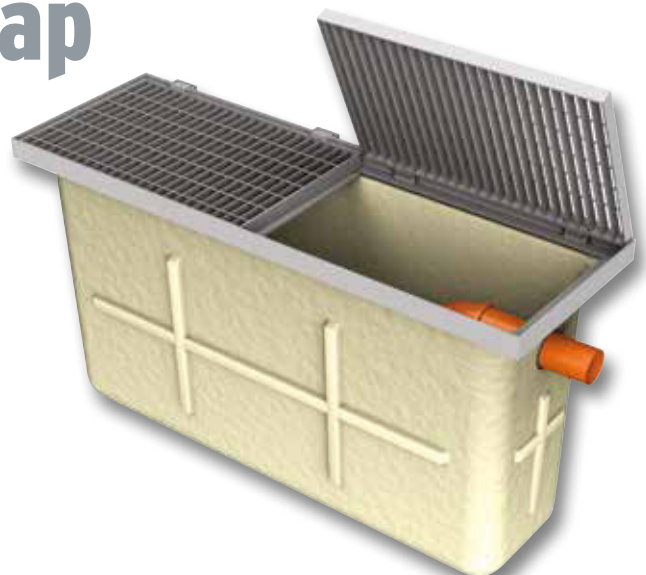
Car Wash Silt Trap

APPLICATION

Car Wash silt trap is designed for use before a separator in car wash applications to ensure effective silt removal.

FEATURES

- FACTA Class B covers.
- Light and easy to install.
- Maintenance from ground level.



Forecourt

APPLICATION

The forecourt separator is designed for installation in petrol filling station forecourts and similar applications. The function of the separator is to intercept hydrocarbon pollutants such as petroleum and oil and prevent their entry to the drainage system, thus protecting the environment against hydrocarbon contaminated surface water run-off and gross spillage.

PERFORMANCE

Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.

In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt. The separator has been designed to ensure that oil cannot exit the separator in the event of a major spillage, subsequently the separator should be emptied immediately.

FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.

SIZES AND SPECIFICATIONS

ENVIRORECEPTOR CLASS	TOTAL CAP. (litres)	DRAINAGE AREA (m ²)	MAX. FLOW RATE (l/s)	LENGTH (mm)	DIAMETER (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT (mm)	STD. FALL ACROSS UNIT (mm)	MIN. INLET INVERT (mm)	STD. PIPEWORK (mm)	EMPTY WEIGHT (kg)
I	10000	555	10	3963	1920	600	2110	2060	50	400	160	500
II	10000	555	10	3963	1920	600	2110	2060	50	400	160	500
I	10000	1110	20	3963	1920	600	2110	2060	50	400	200	500
II	10000	1110	20	3963	1920	600	2110	2060	50	400	200	500



- Class I and Class II design.
- Oil storage volume.
- Coalescer (Class I unit only).
- Automatic closure device.
- Oil alarm system available.

INSTALLATION

The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill. See sales drawing for installation.

If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.

The separator should be installed and vented in accordance with Health and Safety Guidance Note HS(G)41 for filling stations, subject to Local Authority requirements.

Alarm Systems

British European Standard EN 858-1 and Environment Agency Pollution Prevention Guideline PPG3 requires that all separators are to be fitted with an oil level alarm system and that it should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

- Easily fitted to existing tanks.
- Excellent operational range.
- Visual and audible alarm.
- Additional telemetry option.



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In keeping with Company policy of continuing research and development and in order to offer our clients the most advanced products, Kingspan Environmental reserves the right to alter specifications and drawings without prior notice.

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