PUNCH
consulting engineers

Proposed Residential Development at the Former Filling Station, Nutgrove Avenue, Rathfarnham, Dublin 14

Engineering Planning Report

202252-PUNCH-XX-XX-RP-C-0001

April 2021

Document Control

Document Number: 202252-PUNCH-XX-XX-RP-C-0001

Status	Revision	Description	Date	Prepared	Checked	Approved
A0	C01	Draft Issue	12/03/2021	R. Boyd	S. O'Coileir	M. Richardson

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1 Introduction

This report was prepared to accompany a planning application to South Dublin County Council (SDCC) and Dun Laoghaire Rathdown County Council (DLRCC) for the proposed residential development at the former filling station, Nutgrove Avenue, Rathfarnham, Dublin 14. To accommodate access to the Site, it is proposed to relocate the existing traffic lights and pedestrian crossing located on Nutgrove Avenue. Whilst the works relate to a Site located within the SDCC boundary, given the location of the traffic lights and pedestrian crossing which traverse both SDCC and DLRCC lands, a planning application has been lodged to both planning authorities.

This report deals specifically with the surface water drainage; foul water drainage; watermain design; and roads & traffic for the planning application. This report has been prepared with reference to the "Greater Dublin Regional Code of Practice for Drainage Works", "Greater Dublin Strategic Drainage Study" and the "Irish Water Code of Practice for Wastewater Infrastructure". The site location is shown in Figure 1-1 below.

The subject site is currently an empty site, formerly a service station, and is bounded by residential developments to the south and west, Nutgrove Avenue to the north, and Rathfarnham Scout Den building to the east. The application area includes the site of the former filling station under Applicant ownership and a portion of land located to the north of the filling station site, where the existing traffic lights and pedestrian crossing are located along Nutgrove Avenue. Figure 1-1 below indicates the proposed development within the surrounding development.

In preparation of this report, and design of the development, PUNCH Consulting Engineers have liaised with the following parties:

- Brian Harkin, Senior Executive Engineer, SDCC
- Ronan Toft, SDCC Drainage
- John Joe Hegarty, SDCC Roads
- Grainne McDermott, DLRCC Roads
- Sean McGrath, DLRCC Roads

Figure 1-1: Site Location of the Proposed Development

1.1 Proposed Development and Council Boundaries

The proposed works are outlined in a series of architectural drawings prepared by Horan Rainsford Architects and engineering drawings prepared by PUNCH Consulting Engineers and supplied as part of the planning documentation. The proposed development consists of the construction of a multi-storey apartment block with associated site works including car parking and landscaping.

The development is adjacent to the boundary between Dun Laoghaire Rathdown County Council and South Dublin County Council, and as such planning applications are being submitted to both councils for the development. The boundary between the two councils is the centre of Nutgrove Ave. Please refer to the architectural site plan for details. Please refer below summary of development that relates to each relevant council..

- **South Dublin County Council Development**: The proposed residential development site as well as the relocation of that part of the pedestrian crossing and traffic lights within South Dublin County Council.

- **Dun Laoghaire Rathdown County Council Development**: Relocation of that part of the pedestrian crossing and traffic lights within Dun Laoghaire Rathdown County Council.

2 Stormwater Drainage Design

2.1 Existing Stormwater Drainage

Record drawings provided by Irish Water indicate the following public surface water drainage exists adjacent and within the development site:

- 225mm surface water sewer from the south west of the site, within Stonepark Orchard.
- 600mm concrete surface water sewer from the south east of Stonepark Orchard.
- 900mm culvert / 1200mm concrete culvert surface water sewer draining through the site and discharging to the west of the site.
- 600mm concrete surface water sewer, discharging from the site through adjacent lands and to the golf course on the north side of Nutgrove Ave.
- 450mm concrete sewer draining east to west along the north side of Nutgrove Ave.

A topographical survey is included for part of the site, including drainage.

Please refer to Appendix A for Irish Water Record Drawings illustrating the existing stormwater drainage arrangement. An extract is shown in Figure 2-1 below.

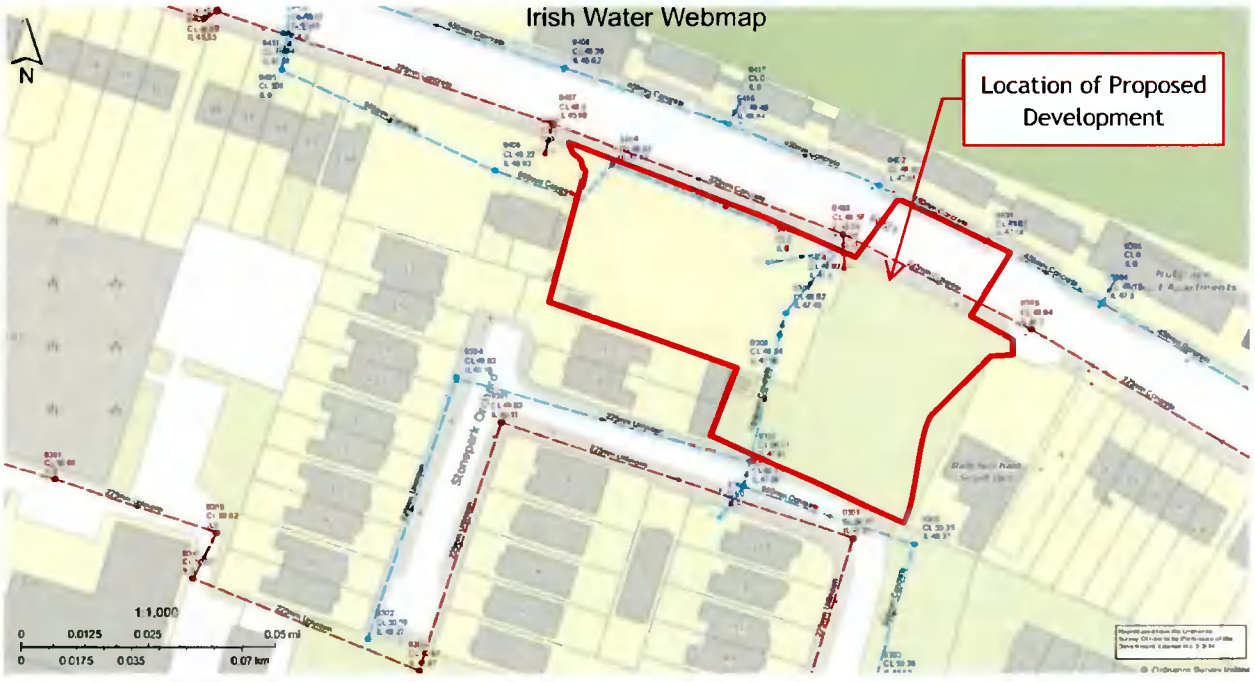

Figure 2-1: Existing stormwater drainage surrounding the site (Source Irish Water Records)

2.2 Proposed Stormwater Drainage

2.2.1 General

The proposed surface water drainage system has been designed using Causeway Flow software in accordance with the Department of Environment and Local Government's guidance document "Recommendations for Site Development Works for Housing Areas", with guidance taken from the "Greater Dublin Strategic Drainage Study" (GDSDS) and the South Dublin County Council (SDCC) Development Plan.

The surface water drainage is to discharge to the proposed underground attenuation tank and is to discharge by gravity to a hydrobrake system. Refer section 2.2.6 below for further details on the proposed attenuation tank. The proposed surface water network for the development will then connect into the proposed diversion of the existing surface water network running through the site. Please refer to PUNCH Drawing No. 202252-PUNCH-XX-XX-DR-C-0100 for details of the proposed surface water drainage system.

The drainage system has been designed with the aim of providing a sustainable drainage solution ensuring, in so far as feasible, that the development has a minimal impact on the existing public surface water sewer system. This is achieved with the incorporation of Sustainable urban Drainage Systems (SuDS).

The SDCC Development Plan 2016-2022 in conjunction with the Greater Dublin Strategic Drainage Study (GDSDS) requires that the site discharge be reduced. The runoff is to be reduced for the 1% AEP (1:100 year storm return period), with an additional 10% to be added to rainfall to allow for climate change.

2.2.2 Proposed Development Drainage Network

The surface water runoff from the proposed development is to be entirely separate from the development's foul sewerage network development drainage.

All surface water run-off from roof areas and hardstanding areas are designed to be collected by the gravity pipe network. The surface water from any open deck parking areas or pavements shall be collected via a series of gullies, channels, and permeable paving, and are to be discharged to the same surface water drainage network.

2.2.3 Soils and Geotechnical

The GSI quaternary maps for the region, from www.gsi.ie indicate that the soil type is at the interface between two types of soil: till derived from limestones (boulder clay) and gravels derived from limestones.

Adjacent ground investigation records from www.gsi.ie indicate that, for a site nearby, immediately to the north of Nutgrove Ave has a clay ground profile.

Based on this information, the site is taken to have an intermediate soil natural ground profile. Therefore, a SOIL type of 3 (moderate runoff potential) has been utilised for the development, with a consequent SOIL value of 0.4 for the calculation of Qbar.

Refer to extracts from the quaternary maps shown in Figure 2-2 below.

Figure 2-2: Map Extract from Quaternary Map at www.gsi.ie with and site indicated.

2.2.4 Rainfall

A value for the SAAR for the site has been obtained from the Met Eireann Website. https://www.met.ie/cms/assets/uploads/2018/07/IE_AAR_8110_V1.txt. This value is 813mm.

2.2.5 Qbar calculations

The following values have been used to calculate Qbar:

SAAR = 813mm (refer to section 2.2.4 above)

Site impervious area = 0.283 Ha (Area = 0.00283 km²)

SOIL = 0.4 (refer to section 2.2.3 above)

To establish Qbar for a site less than 50Ha, Qbar for 50Ha is calculated, and then proportionately reduced to the actual site area.

Refer below for Qbar calculation:

Qbar for 50Ha

$$Qbar\ (50Ha) = AREA^{0.89} SAAR^{1.17} SOIL^{2.17}.$$

$$Qbar\ (50Ha) = 0.50^{0.89} 813^{1.17} 0.4^{2.17} = 202.67 l/s$$

Proportionate Qbar for 0.283Ha:

$$Qbar\ (site) = \frac{Qbar(50Ha) \times Site\ area}{50}$$

$$Qbar\ (site) = \frac{226.5 \times 0.283}{50} = 1.15 l/s.$$

This results in a Qbar value of 1.15 l/s.

2.2.6 Attenuation Tank

The proposed attenuation tank, in conjunction with the proposed hydrobrake flow restriction device is sized to reduce the runoff from the site to 1.15 l/s/ha for the 1% AEP (1:100 year storm return period) storm, with 10% additional rainfall to allow for climate change.

The result of this analysis requires an attenuation tank of 275 cu.m total volume. The attenuation tank is to be located in the ground, and the outlet is to be controlled by a hydrobrake.

The attenuation tank is proposed to be a geocellular style system. All surface water from the surface water network will enter and exit the geocellular tank system via a perforated distribution pipe through the system. This arrangement ensures that all debris and silt will not enter the geocellular system and will be restricted to the distribution pipe. If maintenance is ever required to remove silt or debris, a pressure jetting system will be able to clean any debris from this distribution pipe.

Please refer to PUNCH drawing 202252- PUNCH-XX-XX-DR-C-0500 for details of the proposed attenuation tank.

2.2.7 Proposed Discharge Location

The outlet from the attenuation tank is designed to discharge to the proposed downstream manhole along the diverted surface sewer within the site. A new manhole is to be utilised for connection, with the new pipe to connect at invert level of the existing surface water sewer.

A non-return valve is proposed at the outlet from the attenuation tank.

Any existing surface water sewer connections to the site are to be removed.

Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0100 for details of the proposed drainage.

2.2.8 Proposed Surface Sewer Diversion

As part of the proposed development, it is proposed to divert the existing surface water sewer that crosses the site.

2.2.8.1 Surface Water Sewer Diversion - Existing Sewer Details

Records for the upstream network have been obtained in order to ascertain the upstream catchment area. Refer to Figure 2-3 for the layout of the existing surface water sewer network upstream of the diversion. Refer to Appendix A for drainage records.

It should be noted that the existing sewer downstream limits the potential for drainage capacity provision. Please refer Figure 2-1 for image of records, and to Appendix A for full record information.

A survey for the site exists from 2007. This survey, in conjunction with records, indicates that the pipes vary in size along the existing sewer route through the site. These records indicate that the sewer starts

at 600mm diameter at the upstream end, changes to 900mm culvert, then to a 1200mm culvert, and then sizes back down to 600mm, before turning west across the site. The outlet from the site is recorded as 600mm diameter.

The area of the upstream catchment has been measured as 18.3Ha. The upstream area primarily consists of existing housing estates. On this basis, an overall percentage impervious rate of 70% has been taken.

A summary of the above drainage assumptions has been included in Table 2-1 below. The existing surface sewer catchment and existing surface sewer drainage upstream of the site is shown in Figure 2-3.

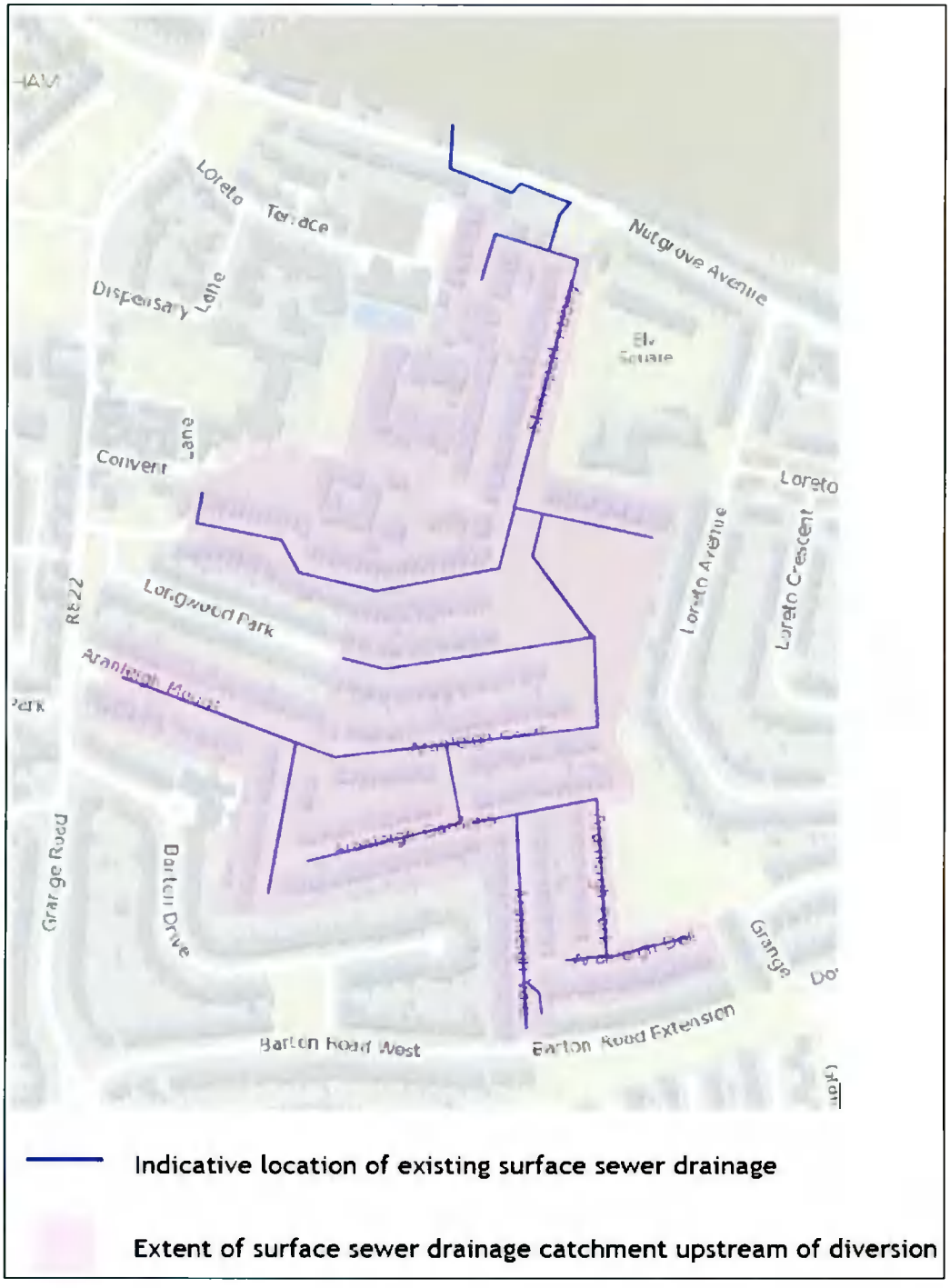

Figure 2-3 - Catchment of Existing Surface Sewer Diversion

Table 2-1: Surface Sewer Diversion Assumptions Summary

Item	Value	Comment
Catchment Area	18.3ha	Measured from OS Mapping
Pipe maximum length	1,000m	Measured from OS Mapping based on service records
Upstream Average Pipe Flow velocity	1m/s	Assumed
PIMP (impervious proportion)	70%	Based on housing estate catchment
TC : Time of Concentration into diverted network	20.7mins	4 min global time of entry plus 16.7mins travel time across network
Existing Culvert heights	600mm	Assumed

2.2.8.2 Surface Water Sewer Diversion - Diversion alignment and Wayleave

The surface water sewer is to be diverted completely within the development site.

It is proposed that the sewer be diverted to the rear (south) of the site to facilitate the construction of the proposed development. Correspondence with SDCC has advised that a wayleave of width 7.0m centred on the pipeline (3.5m either side) is acceptable.

All buildings are to be clear of the proposed and retained surface sewer wayleave. Other services, landscaping and pavements are proposed within the wayleave.

The alignment of the surface sewer diversion has been discussed with SDCC, with only minor concerns raised in relation to its alignment. Refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0100 for drainage layout, PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0102 for combined services overlay showing clearances from sewer to other services, and PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0501 and 202252-PUNCH-XX-XX-DR-C-0502 for cross section through wayleave and the proposed building.

Minor landscape works are proposed in the wayleave, including fences and benches. All trees and hedges are proposed in planters above ground in the wayleave area. Refer to landscape information submitted as part of planning documentation.

2.2.8.3 Pipeline Capacity Assessment - Overview

The existing variation in pipe sizing is assumed to be for the purpose of small-scale attenuation. The proposed diverted sewer has been sized as a 1050mm diameter pipe, which results in a greater volume in the proposed drainage diversion compared to the existing pipeline. The existing and proposed arrangements have been modelled, with the results compared.

2.2.8.4 Pipeline Capacity Assessment - Pipe Slope

It is noted that the proposed arrangement results in a shorter length of pipeline with associated increased slope of pipeline and pipeline capacity. The existing sewer grade varies between 1 in 263 and 1 in 38. The proposed grade is between 1 in 22 and 1 in 1002. The proposed grade is provided to align pipeline cover from proposed ground levels.

2.2.8.5 Pipeline Capacity Assessment - Pipe Volume comparison

The downstream connection of 600mm diameter is to be retained. A comparison of existing pipe volume and proposed pipe volume is provided below in Table 2-2 and Table 2-3.

This comparison demonstrates that the proposed pipe volume (64.9m^3) is greater than the existing (34.2m^3). This comparison allows for the reduction in pipe length between existing and proposed arrangement.

Table 2-2: Existing Public Network Pipe Volume Through Site

Existing Element	Pipe Size	Length (m)	Total Volume (m^3)
exMH 6 - exMH 5	900mm x 600mm	23.7	12.8
exMH 5- exMH 4	1200mm x 600mm	3.9	2.8
exMH 4 - exMH 3	600mm diameter	15.5	4.4
exMH 3 - exMH 2	600mm diameter	45.9	13.0
exMH 2 - exMH 1	600mm diameter	4.3	1.2
Total	**Varies**	**93.3**	**34.2**

Table 2-3: Proposed Public Network Pipe Volume Through Site

Existing Element	Pipe Size	Length (m)	Total Volume (m^3)
exMH 6 - SMH 3.1	1050mm diameter	7.8	6.75
SMH 3.1 - SMH 3.2	1050mm diameter	15.1	13.1
SMH 3.2- SMH 3.3	1050mm diameter	36.1	31.3
SMH 3.3 - SMH 3.4	1050mm diameter	15.8	13.7
Total		**74.8**	**64.9**

The proposed arrangement also results in an improved hydraulic arrangement, with no acute changes of direction.

2.2.8.6 Pipeline Capacity Assessment - Flow Modelling

The existing sewer arrangement and proposed sewer arrangement through the site have been re-modelled using Causeway Flow software. The existing and proposed arrangement have been compared by storm event (return period and storm duration). The results of this assessment demonstrate that there is existing flooding at existing manholes through the site. The drainage outputs for existing and proposed situations are included in Appendix B to this submission and includes existing results and proposed results. Table 2-4 below compares the drainage flood volumes for events which have flood occurrences, both for the existing and diverted networks.

Table 2-4: Summary Comparison of Surface Sewer Diversion Flood Volumes

Storm Event (all +10% climate change)	Existing Network Total Flooding Volume (m^3)	Diversion Network Total Flooding Volume (m^3)
30 year 15min summer	412.2	0.00
30 year 15min winter	611.1	17.5
30 year 30min summer	855.6	105.4
30 year 30min winter	1134.1	249.7
30 year 60min summer	960.96	124.7
30 year 60min winter	1215.9	194.0
30 year 120min summer	744.2	1.5
30 year 120min winter	752.5	0
30 year 180min summer	426.5	0
30 year 180min winter	338.0	0
30 year 240min summer	222.1	0
30 year 240min winter	7.7	0
100 year 15min summer	1018.8	192.1
100 year 15min winter	1262.2	375.4
100 year 30min summer	1650.7	562.7
100 year 30min winter	2063.3	786.0
100 year 60min summer	1881.1	594.4
100 year 60min winter	2274.5	733.8
100 year 120min summer	1620.4	344.9
100 year 120min winter	1799.5	253.0
100 year 180min summer	1313.2	95.3
100 year 180min winter	1225.1	0
100 year 240min summer	935.9	0
100 year 240min winter	681.4	0

Storm Event (all +10% climate change)	Existing Network Total Flooding Volume (m^3)	Diversion Network Total Flooding Volume (m^3)
100 year 360min summer	477.0	0
100 year 360min winter	9.8	0
100 year 480min summer	61.6	0
100 year 480min winter	0	0

The results demonstrate that at a number of storms in the 30 year and 100-year ARI, flooding of manholes occur. Flooding occurs during the same storms for both the existing and proposed arrangement, however the flooded volume in the proposed arrangement is significantly less than the flooded volume in the existing scenario.

The modelling outputs are based on the assumptions listed in Table 2-1.

As mentioned in section 2.2.8.1 above, it should be noted that the diameter of the existing pipe downstream (600mm diameter from records) limits the potential to provide surface water sewer capacity.

As part of previous consultation, SDCC personnel have advised that we should demonstrate that the proposed arrangement will not result in a decrease in the flow rate through the site. Based on this requirement and our assessment, we have met this criterion.

2.2.8.7 Pipeline Capacity Assessment - Proposed Ground Levels and Overland Flow

The proposed levels on site will provide an overland flow path from the surface sewer manholes to Nutgrove Avenue. The proposed ground levels will be lower than the adjacent floor levels. Refer to Figure 2-4 for an indication of overland flow paths adjacent to the proposed surface sewer diversion, as well as PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0150 for finishes plan.

Please note that the provision of cover to the proposed pipeline is limited by the proposed site condition, including:

- Proposed ground levels above the sewer to provide an overland flow path;
- The proposed floor level of the building;
- The level of the ground at the boundary receiving overland flow;
- The invert level of the downstream sewer receiving drainage connection.

Most areas where cover is reduced are in landscape areas adjacent to the south boundary. Any area that has less than 1.2m cover will be provided with appropriate concrete encasement to protect the proposed sewer.

Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0100 and 202252-PUNCH-XX-XX-DR-C-0102 for details of the surface sewer diversion and the development surface water drainage network. Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0150 for SUDS and finishes plan including proposed finished levels at ground level.

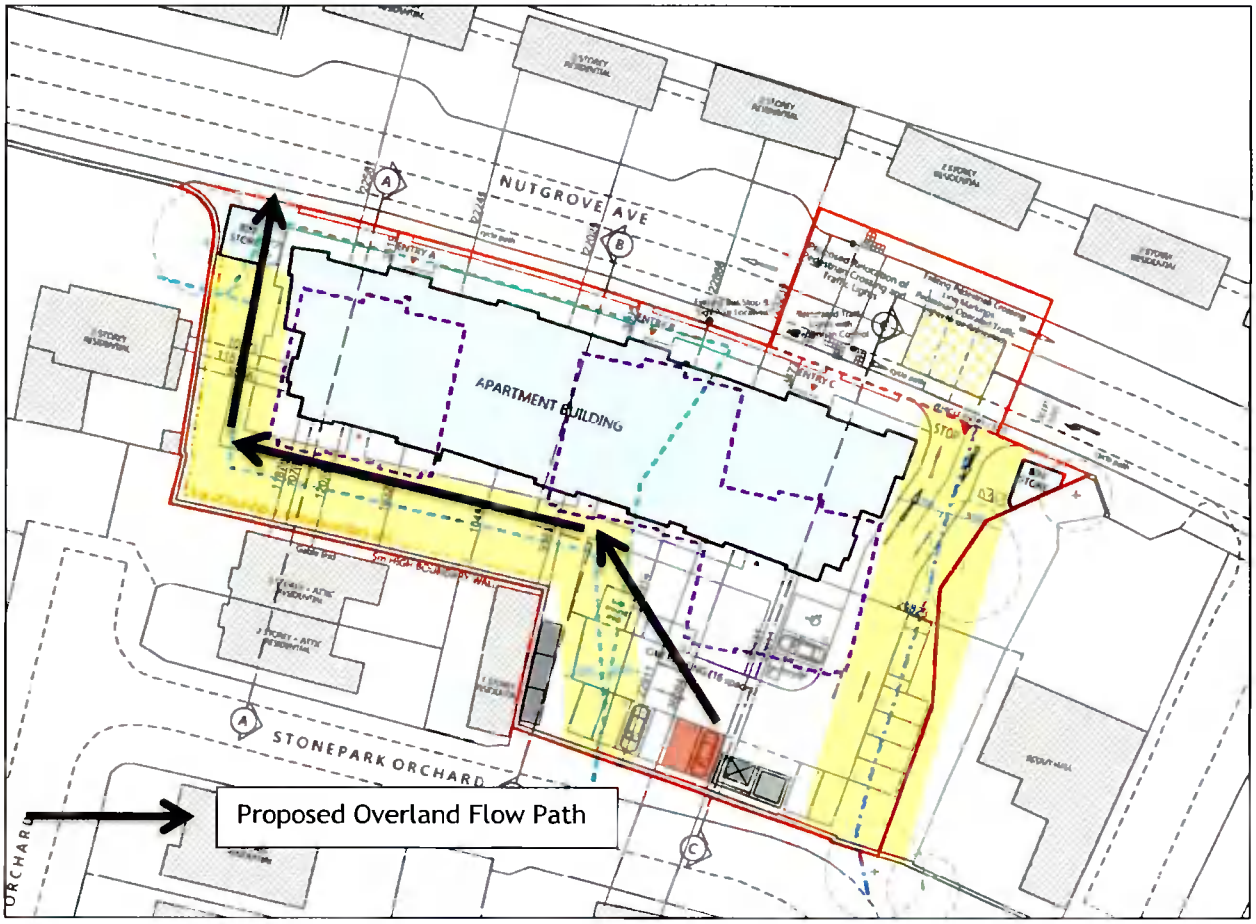

Figure 2-4: Overland Flow Paths from Surface Sewer Diversion (extract from Architectural Site Plan)

2.2.8.8 Surface Water sewer Diversion - Landscape and Boundary Interface

The proposed drainage diversion will place the sewer closer to the adjacent boundary wall to the south. This existing wall will be underpinned clear of the wayleave to provide appropriate structural stability.

Hard and soft landscaping is proposed above the proposed public sewer diversion. Any trees or hedges are proposed to be provided within removeable planters. Please refer to landscape documentation for details.

2.2.8.9 Surface Water Sewer Diversion - Summary

An existing public surface water sewer is to be diverted within the site.

The proposed 1050mm internal diameter pipeline is to be within a wayleave 3.5m either side of the centre of the proposed pipeline.

The existing and proposed routes result in theoretical flooding of the network based on a single catchment assessment upstream. The proposed route results in significantly less flooding than the existing, removes acute angles in the pipeline and increases the volume of the pipeline on site.

The overland flow path is proposed around the building, with proposed ground levels lower than the proposed building floor level.

Pipeline grades are proposed to reflect the proposed ground levels and provide appropriate cover to the pipeline.

Diversion capacity is limited by the downstream pipe diameter. If a larger diameter pipe were available downstream, the pipe would not be above capacity.

Based on the above, it is determined that the proposed arrangement presents a significant improvement when compared to the existing condition.

2.2.9 Stormwater Drainage Summary

The following list summarises the proposed surface water drainage:

- A new surface water drainage network is proposed to service the proposed development.
- The new network is to be completely separate from the proposed foul network.
- A new attenuation tank is proposed to limit the surface water discharge from the development.
- An existing public surface water sewer is to be diverted within the site to allow for the proposed development.

Table 2-5 below describes the stormwater drainage design used. Detailed calculations are enclosed in Appendix C.

Table 2-5: Stormwater Drainage Summary

Description	Value
Total Impervious Site area	0.283 ha
Return period target	Pipe Design 1 in 5 year. Network Design 1 in 30 year + CC. Check 1 in 100 year + CC for flooding.
Climate Change	10%
M5-60	18.2
Ratio R	0.275
SOIL type	3 (Silty)
Soil value	0.4
SAAR	813mm
Flow reduction parameter	Qbar
Controlled Outflow	1.15 l/s
Flow restriction method	Hydrobrake
Attenuation Storage Volume	275 m^3
Infiltration Rate	0 mm/hr

Please refer to the following drawings for further details:

- 202252-PUNCH-XX-XX-DR-C-0100: Proposed Drainage Layout
- 202252-PUNCH-XX-XX-DR-C-0150: Proposed SuDS Measures
- 202252-PUNCH-XX-XX-DR-C-0500: Attenuation Tank Details
- 202252-PUNCH-XX-XX-DR-C-0503: Typical Drainage Details
- 202252-PUNCH-XX-XX-DR-C-0501: Civil Details, including Site Section A-A (through proposed building, proposed site drainage, and proposed surface sewer).

A breakdown of the surface types, approximate surface areas and surface runoff coefficients assumed are provided in Table 2-6 below:

Table 2-6: Development Surface Areas and Design Runoff Coefficients

Structure Type	Area Ha (Hectares)	Runoff Parameter
Buildings	0.059	Impervious allowance
Green Roofs	0.029	Impervious allowance
Roads	0.036	Impervious allowance
Pathways	0.060	Impervious allowance
Permeable Paving	0.020	Impervious allowance
Landscaped areas	0.078	Not allowed for in drainage design
Total	**0.282**	

Causeway Flow software has been used for the drainage design in this report. Causeway Flow does not use different runoff coefficients to assess drainage, the areas inputted are taken to be impervious.

2.3 SUDs Proposals

The proposed development has been assessed in relation to Sustainable Urban Drainage Systems (SuDS). A variety of SuDS measures may be adopted to comply with SDCC recommendations. All SuDS measures are to be implemented with reference to the UK Suds Manual and SDCC Council drainage requirements.

Relatively small volumes of rainwater collected on the respective SuDS devices will enter the public sewer network during typical low intensity storms. This is because the proposed SuDS measures will retain rainwater until it is either used via evapotranspiration in the green areas or reused within the development via the rainwater harvesting system.

The SuDS processes decrease the impact of the development on the receiving environment by providing amenity and biodiversity in many cases. Regular maintenance of the SuDS proposals is required to ensure they are operating to their optimal level throughout their design life.

The specific measures adopted for the proposed development comprise the following:

- Permeable modular pavers for the car parking areas;
- Green roofs.

SUDS measures proposed as part of this development have been designed taking guidance from CIRIA Publications C644 - "Building Greener" and C697 - "The SUDS Manual".

In addition to proposed SUDS measures, pervious landscape areas are proposed at ground level.

2.3.1 Green Roofs

Green roofs are areas of living vegetation, installed on the top of buildings, for a range of reasons including visual benefit, ecological value, enhanced building performance and the reduction of surface water runoff.

It is proposed to provide an extent of green roofs within the development. These shall be provided at roof level in the form of 'extensive' sedum green roofs. Green roofs are widely recognised as an effective SuDS solution and an important tool in mitigating the adverse effects of development on rainfall run-off and for managing urban runoff.

A sedum moss extensive green roof system is proposed for part of the proposed new roof. The detail of the green roof as well as associated roof drainage and access systems are to be provided by the architect.

Extensive green roofs are defined as follows:

- Areas containing vegetation such as sedums and small grasses.
- Less maintenance than other green roof types.
- No permanent irrigation system.
- Topsoil Substrate Depth = 80mm.

The build-up for the proposed green roof shall primarily comprise the following:

- Grass/mulch with planting.
- A topsoil substrate (depth dependent on the green roof type) on 100mm depth drainage mat.

Research in the UK (Kellagher and Lauchlan, 2005, CIRIA, 2007) indicates that green roofs are effective in providing both attenuation and volume reduction in runoff for small rainfall events but suggests that these advantages are reduced (but not completely lost) for larger rainfall events.

Please refer to landscape architect / architect's documentation for details of proposed green roofs.

2.3.2 Permeable Pavements

The car parking bays on site are proposed as permeable pavements.

To manage discharge of oils, and because the soil below the car parks is expected to be impermeable clay, the proposed permeable pavement is to be sealed below the gravel layers.

The treatment processes that occur within permeable pavements include:

I. Filtration of silt and the attached pollutants - the majority of silt is trapped within the top 30mm of the jointing material between the blocks.
II. Biodegradation of organic pollutants, such as petrol and diesel within the pavement construction
III. Adsorption of pollutants (pollutants attach or bind to surfaces within the construction) which depends on factors such as texture, aggregate structure and moisture content.
IV. Settlement and retention of solids.

The use of permeable pavers for car parks is proposed as an alternative to an oil separator for the car parking areas. The use of permeable pavers for this purpose is supported by the treatment processes outlined above.

2.3.3 Attenuation Tank

The proposed attenuation tank is sized to reduce the peak runoff from the site and is described in section 2.2.6 above.

2.3.4 Gullies

Any surface water which lands on the car park access aisles (and other pavements) will discharge to catchpit gullies prior to discharge to the surface water drainage network. These catchpit manholes will treat harmful silts.

2.4 Compliance with the GDSDS

The design is provided to comply as much as possible with the requirements of the GDSDS, in particular regarding providing attenuation for the development for the Q100 return period storms.

Please also refer to the PUNCH Site Specific Flood Risk Assessment.

3 Foul Water Drainage Design

3.1 Existing Foul Water Drainage

Irish Water record drawings indicate the following foul water drainage exists adjacent to the site of the proposed development.

- A 225mm concrete sewer is located on Nutgrove Avenue, to the north of the development. This sewer drains in an East to west direction. There is an existing site service that connects to this foul sewer line.
- A 225mm sewer runs to the south of the development, following Stonepark Orchard in east to west direction.

The site was formerly developed as a service station, and there may be existing redundant foul drainage on site. A topographic survey has been undertaken for the site which includes drainage.

Please refer to Appendix A for Irish Water Record Drawings illustrating the existing foul water drainage arrangement. An extract is shown in Figure 2-1.

3.2 Proposed Foul Water Drainage

3.2.1 General

It is proposed to retain the existing foul sewer connection location on Nutgrove Ave.

Foul water drainage has been designed with using Causeway Flow software in accordance with the following documentation:

- *"Recommendations for Site Development Works for Housing Areas"* published by DOE
- *"Code of Practice for Wastewater Infrastructure"* published by *Irish Water - particularly Appendix D - Wastewater Flow Rates for Design*
- *"Greater Dublin Regional Code of Practice for Drainage Works"*
- *"Design Recommendations for Multi-storey and Underground Car Parks"* published by the Institution of Structural Engineers.

3.2.2 Proposed Foul Water Flows

It is proposed that the foul sewer will discharge by gravity to the existing 225mm diameter Concrete foul sewer on Nutgrove Ave, to the north of the development.

Please refer to PUNCH Drawing No. 202252-PUNCH-XX-XX-DR-C-0100 for details of the proposed foul water drainage system.

Table 3-1 below describes the foul water drainage design parameters used and detailed calculations are enclosed in Appendix D.

Table 3-1: Foul Water Drainage Design Parameters

Description	Value
Residential Flow Rate	150 l/per/day
Persons per Dwelling	2.7
Additional Flow	10%
Peaking Factor	6 DWF (Residential)
Minimum Self Cleansing Velocity	0.75m/s
Minimum Pipe Diameter	150mm

Table 3-2 and Table 3-3 present the foul flows for the development, indicating existing, total and net increase. The total dry weather flow (DWF) was calculated as 0.165 l/s with a peak flow of 0.99 l/s. The daily foul loading is 14.26 m^3. The sewers are designed for the peak flow.

It is noted that both the new and existing component of the development will incorporate water conservation measures in the sanitary facilities throughout. These will include low flow dual flush toilets, and monobloc low volume push taps. These will reduce the foul discharge from the development.

Table 3-2: Dry Weather Foul Sewerage Flow

Component	Number of Dwellings	Persons Per Dwelling	Population	Flow Rate per person per day	Dry Weather Flow
Residential	28	2.7	76	150	12.54 cu.m/day or 0.145 l/s

Table 3-3: Peak Foul Sewerage Flow

Component	Population	Dry Weather Flow	Peaking Factor	Peak Flow
Residential	86	12.54 cu.m/day or 0.145 l/s	6	75.24 cu.m/day or 0.87 l/s

A Pre-Connection Enquiry Form has been issued to Irish Water in relation to the proposed development. Irish water has provided a response, advising that the wastewater connections is feasible without any infrastructure upgrade. Please refer to Appendix E for Irish Water correspondence.

4 Watermain Design

4.1 Existing Water Infrastructure

4.1.1 Existing Public Water Infrastructure

Irish Water record drawings indicate the following existing public watermain infrastructure exists adjacent to the development:

- 12-inch (~300mm) Asbestos watermain to the east of the site.
- 4-inch (~100mm) uPVC watermain on Nutgrove avenue, connecting to the 12-inch asbestos watermain on site.
- 100mm uPVC watermain along Stonepark Avenue, connecting to the 12-inch asbestos main on site.

Please refer to Appendix A for Irish Water Record drawings illustrating the existing watermain arrangement. An extract is shown in Figure 4-1 below.

A topographic survey has been completed for the site, that includes drainage records.

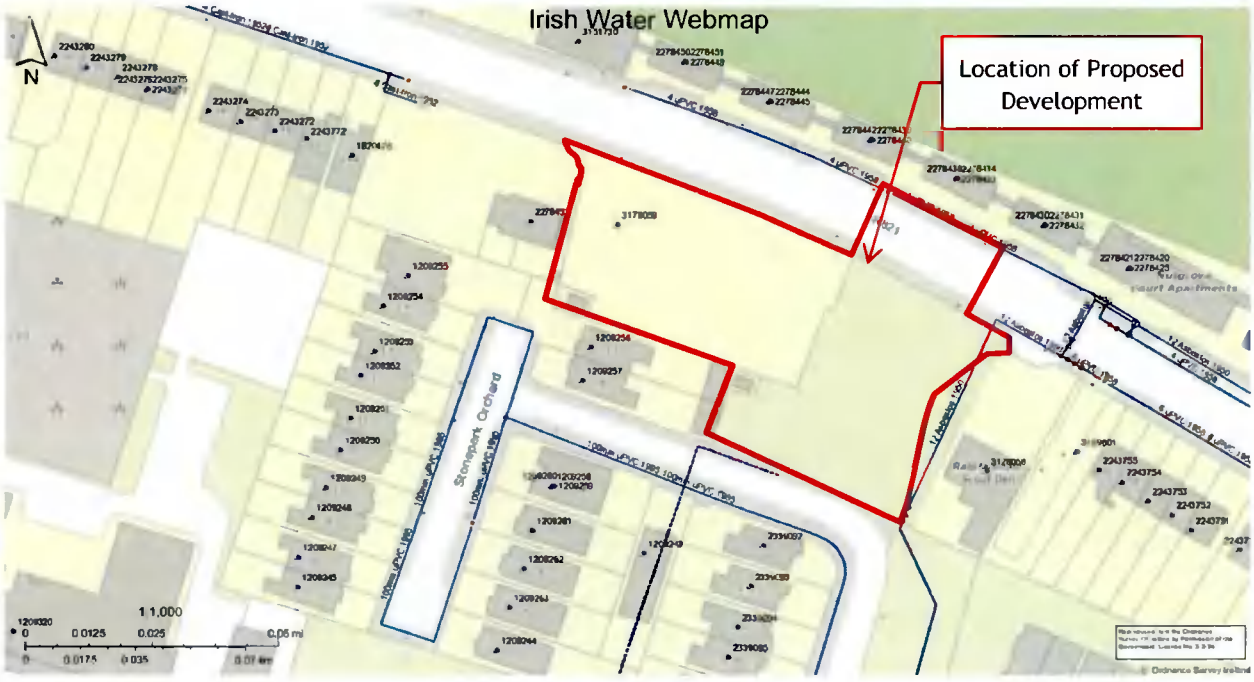

Figure 4-1: Existing watermain surrounding the site (Extract from Irish Water records)

4.1.2 Existing On site, private Water Infrastructure

There may be redundant private water infrastructure on site from the former development.

4.2 Proposed Watermain

4.2.1 General

Water supply has been designed with reference to the following documentation:

- "*Recommendations for Site Development Works for Housing Areas*" published by DOE
- "*Code of Practice for Wastewater Infrastructure*" published by *Irish Water - particularly Appendix D - Wastewater Flow Rates for Design*
- "*Code of Practice for Water Infrastructure*" published by *Irish Water - particularly Appendix D - Wastewater Flow Rates for Design*

4.2.2 Proposed Water Supply

A new water supply network is proposed on site to service the new proposed buildings.

It is proposed to connect the water supply for the proposed development to the existing 100mm watermain on Stonepark Orchard to the south of the site.

4.2.3 Works Associated with Existing Public Watermain on Site

The existing 12-inch asbestos watermain on site is to be retained; and a wayleave is to be implemented across it. The wayleave is to be a total of 10.3m wide to provide 5m clear distance from the existing water main either side.

All buildings are to be clear of the watermain. Services and pavements are proposed within the wayleave. 2m clearance is to be provided from proposed services to the existing watermain in accordance with Irish Water clearance requirements.

Refer PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0200 for the proposed watermain layout and drawing 202252-PUNCH-XX-XX-DR-C-0102 for an overlay of all proposed and existing services overlaid together, showing clearances from the existing watermain to proposed services.

4.2.4 Water Supply Demand

It is generally accepted that the design loading for foul drainage can be used to evaluate an approximation of the water demand on the site, without additional flow to allow for supply water infiltration. Based on this, the following flow rates are to be used:

- 150 litres/person/day for occupants
- 2.7 persons per dwelling

With reference to Irish Water's Code of Practice for Water Infrastructure, the average daily flow is calculated as the number of persons multiplied by the flow rate per person. The average day peak week flow is taken to be 1.25 x the average flow, and the peak demand is taken to be the average day peak week flow multiplied by a peaking factor of 5.

Table 4-1 describes the watermain design parameters used.

Table 4-1: Watermain Design Parameters

Description	Value
Residential Flow Rate	150 l/per/day
Persons per Dwelling	2.7
Average Demand	1.25 DWF
Peak Demand	5 DWF

Table 4-2: Watermain Design Calculation

Category	Quantity	Flow Rate	Daily Flow (l/day)	DWF (l/s)	Average Demand (1.25DWF) (l/s)	Peak Demand (5DWF) (l/s)
Residential	28 units =>76 persons	150 l/per/day	11400	0.132	0.165	0.825

Based on the above tables, the development will have an increase in average water demand of 0.19l/s and a peak water demand of 0.94l/s.

It is proposed to construct a 100mm diameter watermain to serve the proposed development based on the above calculated demand. The proposed watermain will connect to the existing watermain on Stonepark Orchard.

This feed will provide potable and firefighting water to the proposed development. A bulk water meter shall be provided at the site boundary at the location of the proposed connection to the existing watermain. The watermain layout has been designed in accordance with "Irish Water Code of Practice for Water Infrastructure". All watermains are to be constructed in accordance with Irish Water Code of Practice and the Local Authority's requirements. Fire coverage is to be reviewed and certified by the fire consultant.

A Pre-Connection Enquiry Form has been issued to Irish Water in relation to the proposed development. Irish water has provided a response, advising that water servicing is feasible without any infrastructure upgrade. Please refer to Appendix E for Irish Water correspondence

4.2.5 Water Reduction Measures

To reduce the water demand on Local Authority water supplies and to reduce the foul discharge from the development, water conservation measures will be incorporated in the sanitary facilities throughout the development, e.g. dual flush toilets, monobloc low volume push taps and waterless urinals.

5 Flooding

A Flood Risk Assessment has been undertaken by PUNCH Consulting Engineers for the development which accompanies this planning submission.

6 Roads and Access

6.1 Proposed Roads & Access

6.1.1 Existing Roads

Existing roads adjacent to the site include Nutgrove Ave to the north and Stonepark Orchard to the south.

Nutgrove Avenue is a link road between Grange Road to the west and Churchtown Road Upper to the east. It is a single lane two way carriageway with footpaths on both sides and sections of designated cycle lanes on the westbound side.

Stonepark Orchard is a local estate road providing only local access to residences within the neighbouring estate.

Please note that existing conditions shown are based on a detailed topographic survey from 2007, Google street views, Google aerial photography, and site visits. Relevant street furniture is shown indicatively.

6.1.2 Proposed Roads and Junctions

The proposed onsite roads layout was designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) and the Recommendations for Site Development Works. DMURS aims to aid the design of safer, more attractive and vibrant streets which will generate and sustain communities and neighbourhoods. As well as cars and other vehicles this encompasses pedestrians, cyclists and those using public transport. Research has shown that narrow carriageways are one of the most effective measures of traffic calming. This has been factored into the design of the development.

The development is proposed to provide a junction to Nutgrove Avenue. The location of the junction conflicts with an existing pedestrian crossing. The existing signalised pedestrian crossing is to be relocated to the west of the proposed access as a signalised pedestrian crossing. Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0450 for relocation arrangement.

6.1.3 Sightlines Assessment

Sight lines at the proposed junction with Nutgrove Ave were assessed in accordance with DMURS based on existing speed limits on the main road (50km/hr). It should be noted in particular there is significant visibility to the new signalised pedestrian crossing for vehicles exiting the site.

It should be noted that existing street furniture is significantly clear of the proposed access and sightlines (adjacent bus stop and traffic light). Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0625 for sightline arrangement.

6.1.4 Vehicle Access to Site

Access to the site is required for car access to the car park only.

Waste collection is proposed on Nutgrove Ave from the proposed bin enclosures facing Nutgrove Ave.

Fire tender access is required from Nutgrove Ave. Advice from a fire engineer has been provided in this regard. Please refer Appendix F for correspondence detailing Fire Tender Access compliance.

6.1.5 Autotrack Analysis

Autotrack assessments were carried out on the proposed road network and demonstrate that cars can safely negotiate the proposed road network and turning heads. Please refer to PUNCH drawing 202252-PUNCH-XX-XX-DR-C-0600, 202252-PUNCH-XX-XX-DR-C-0601, 202252-PUNCH-XX-XX-DR-C-0602, and 202252-PUNCH-XX-XX-DR-C-0603.

6.2 Traffic Impact Statement

6.2.1 TII Requirements

The proposed development is below thresholds set by Transport Infrastructure Ireland (TII) for the requirements of a Traffic and Transport Assessment (TTA) as per Section 2, Table 2.1 of the Traffic and Transport Assessment Guidelines (PE-PDV-02045) May 2014:

- *Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.*
- *Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.*
- *Residential development in excess of 200 dwellings. Retail and leisure development in excess of 1,000m2. Office, education, and hospital development in excess of 2,500m2.*
- *Industrial development in excess of 5,000. Distribution and warehousing in excess of 10,000m2.*

For completeness, an assessment of the traffic generated from the proposed development is briefly addressed here. Traffic survey data for Nutgrove Avenue, completed in 2016 was also reviewed as part of this analysis.

6.2.2 Existing Traffic

Due to the Covid-19 travel and work restrictions in place at the time of preparing for this development submission historical traffic survey data was used to assess the existing traffic on Nutgrove Avenue.

Historical traffic surveys for Nutgrove Avenue were obtained from between the 19th and the 25th of November 2016 and are deemed to be still valid for this proposed scheme due to their relatively recent undertaking.

The traffic surveys undertaken found the morning peak traffic flow on Nutgrove Avenue was 702 PCUs and occurred between 11:00 and 12:00 (AM). The evening peak traffic flow was 1041.2 PCUs and occurred between 17:30 and 18:30 (PM).

Please refer to Appendix G for traffic survey results.

6.2.3 Proposed Traffic

TRICS was used to calculate the trip rate/trip generation from the proposed development. TRICS® (v7.6.1) enables its users to undertake calculations, using a number of calculation parameter options, to ascertain potential levels of trip generation for a user-defined development scenario. The proposed development requires a trip rate calculation based on a residential development type.

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Michael Punch and Partners 97 Henry Street Limerick Licence No: 434201

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	76	82	0.034	76	82	0.112	76	82	0.146
08:00 - 09:00	**76**	**82**	**0.045**	**76**	**82**	**0.140**	**76**	**82**	**0.185**
09:00 - 10:00	76	82	0.055	76	82	0.069	76	82	0.124
10:00 - 11:00	76	82	0.054	76	82	0.065	76	82	0.119
11:00 - 12:00	76	82	0.052	76	82	0.063	76	82	0.115
12:00 - 13:00	76	82	0.065	76	82	0.066	76	82	0.131
13:00 - 14:00	76	82	0.057	76	82	0.065	76	82	0.122
14:00 - 15:00	76	82	0.056	76	82	0.056	76	82	0.112
15:00 - 16:00	76	82	0.077	76	82	0.054	76	82	0.131
16:00 - 17:00	76	82	0.090	76	82	0.060	76	82	0.150
17:00 - 18:00	76	82	0.124	76	82	0.064	76	82	0.188
18:00 - 19:00	**76**	**82**	**0.125**	76	82	0.073	**76**	**82**	**0.198**
19:00 - 20:00	20	120	0.085	20	120	0.055	20	120	0.140
20:00 - 21:00	20	120	0.050	20	120	0.035	20	120	0.085
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.969			0.977			1.946

Figure 6-1: TRICS Trip Rate for Nutgrove Avenue

Based on the trip rates identified in Figure 6-1 the development is predicted to generate additional Passenger Car Units (PCUs) at rates shown in Table 6-1 onto the existing road network. Please refer to Appendix H for the TRICS report.

Table 6-1: PCUs for Proposed Development

	Arrivals Peak Trip Rate			Departures Peak Trip Rate		
	Trip Rate	Units	PCU	Trip Rate	Units	PCU
AM	0.045	28	1	0.140	28	4
PM	0.125	28	4	0.073	28	2

As can be seen from the above Table 6-1 the predicted additional traffic onto the existing road network is expected to be minimal during peak times for the proposed development. It is also worth noting that the Peak AM arrivals time associated with the development are 08:00-09:00, while the Peak PM departures times are 18:00 - 19:00.

6.2.4 Comparison

Comparing the development generated traffic flows at peak hours, with the 2016 traffic survey data for Nutgrove Avenue found that traffic to and from the development would be between 0.6% and 0.7% of the existing peak traffic flows on Nutgrove Avenue.

6.2.5 Conclusions

The developments predicted traffic flows are found to be relatively low and would have a minimal impact on the exiting traffic on Nutgrove Avenue. Taking an exceptionally conservative approach in assuming 1 PCU per residential unit (28 PCUs total) was to exit/enter the development at peak hours, equating to 4% additional traffic at the AM peak, and 2.7% would still below the TII requirements for Transport Assessments.

6.3 Parking

6.3.1 Car Parking

Proposed parking at the development will consist of 16 no. vehicle parking spaces, of which 1 no. will be designated disabled parking bays, and 2 no. will be designated EV (electric vehicle) charging points. The quantity of parking is subject to the architectural design. Please see the below Table 6-2 for a summary of the maximum car parking rates outlined in the South Dublin County Council (SDCC) Development Plan 2016-2022 (Section 11.4.2, Table 11.24):

Table 6-2: SDCC Development Plan Car Parking Requirement

Development Type	No. Units	Max Car Parking Rate	Max Car Parking Permitted
Apartments - 1-Bed	8	1.0 space per unit	8
Apartments - 2-Bed	17	1.25 spaces per unit	21.25
Apartments - 3-Bed	3	1.5 spaces per unit	4.5
Total Residential	**28**		**27**

Subject to architectural documentation, 16 no. car parking spaces are proposed. This quantity is lower than the maximum provision permitted by SDCC Development Plan. This is considered an appropriate solution for this development.

The SDCC development plan also outlines requirements for 10% of all parking spaces provide facilities for charging battery operated cars (section 11.4.3). This criterion has been met with the inclusion of and 2 no. EV (electric vehicle) charging points mentioned above.

Technical guidance document M of the Building Regulations 2010 requires that at least 5% of the total number of spaces be designated for disabled parking. This criterion has been met with the inclusion of 1 no. disabled parking bay mentioned above. Design is in accordance with architectural documentation.

6.3.2 Bicycle Parking

62 no. bicycle parking spaces are also to be provided in designated area as indicated on architectural documentation. 48 no of these are to be designated as long-term (residents) spaces for, and 14 no. are to be designated as short-stay (visitor) spaces.

Table 6-3 below summarises the minimum long-term and short-stay bicycle parking rates outlined in the SDCC Development Plan 2016-2022 (Section 11.4.1, Table 11.22):

Table 6-3: SDCC Development Plan Bicycle Parking Requirements

Cycle Space Type	No. Units	Min Bicycle Parking Rate	Min Bicycle Parking Required
Long-Term Space	28	1 space per 5 units	5.6
Short-Stay Space	28	1 space per 10 units	2.8
Total Cycle Parking			**8.4**

Table 6-4 below summarises the minimum long-term and short-stay bicycle parking rates outlined in the Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for planning authorities 2018 (Section 4.17):

Table 6-4: Design Standards for New Apartments Bicycle Parking Requirements

Cycle Space Type	No. Units	Min Bicycle Parking Rate	Min Bicycle Parking Required
Long-Term Space	28	1 space per bedroom	51
Short-Stay Space	28	1 space per 2 apartments	14
Total Cycle Parking			**65**

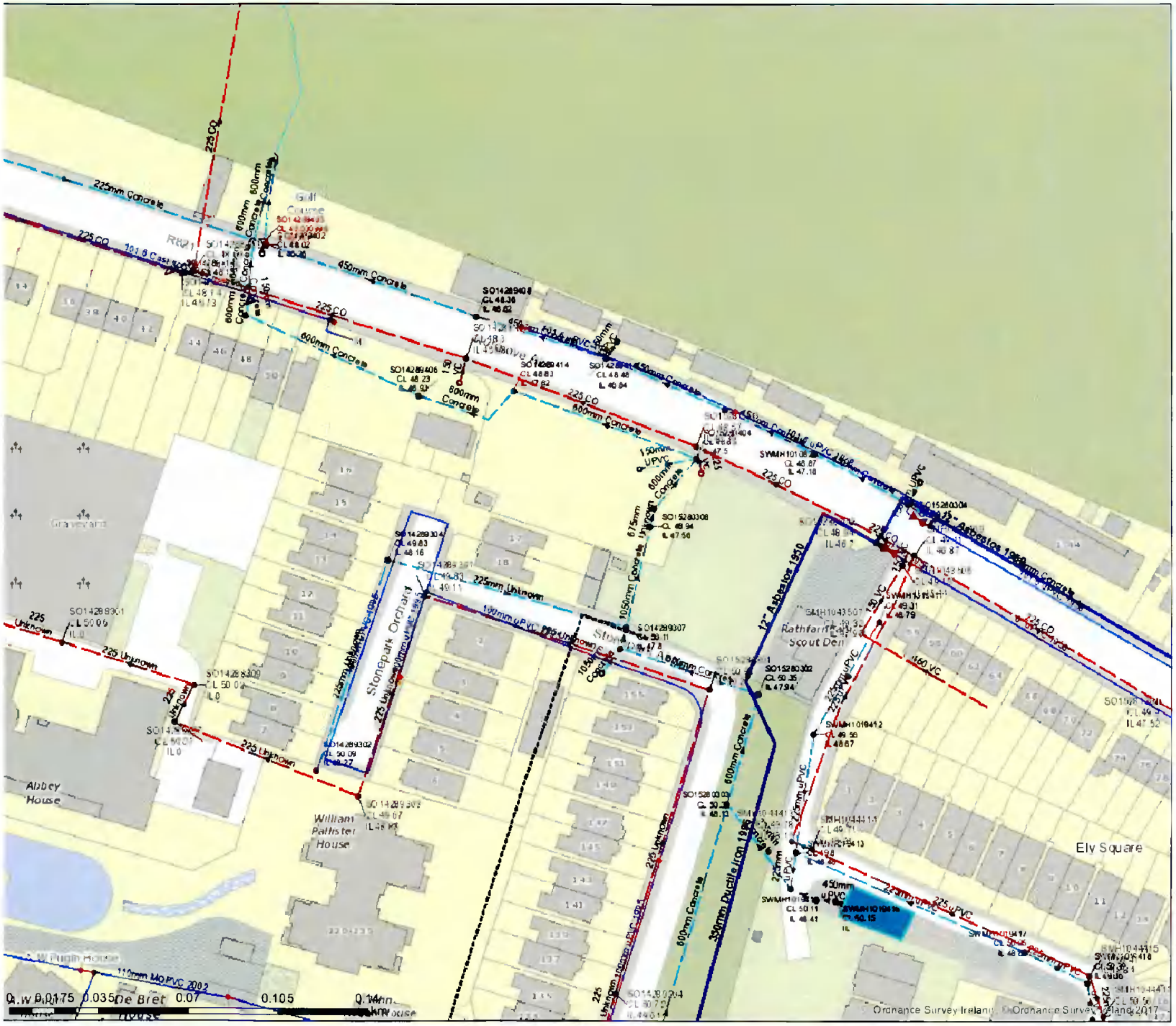
The proposed 62 no. bicycle parking spaces is in excess of the minimum requirements of the SDCC development plan.

6.3.3 Motorcycle Parking

2 no motorcycle parking spaces are proposed. This is in accordance with the SDCC requirement of 3% of the quantity of car parking spaces being provided as motorcycle spaces.

Appendix A Existing Record Drawings

Irish Water Web Map



UISCE ÉIREANN : IRISH WATER

Print Date: 20/10/2020

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Water Distribution Network
Water Treatment Plant
Water Pump Station
Storage Cell/Tower
Pressing Point
Meter Station
Abstraction Point
Telemetry Kiosk
Reservoir
Potable
Raw Water
Water Distribution Mains
Irish Water
Private
Trunk Water Mains
Irish Water
Private
Water Lateral Lines
Irish Water
Non IW
Water Casings
Water Abandoned Lines
Boundary Meter
Bulk/Check Meter
Group Scheme
Source Meter
Waste Meter
Unknown Meter / Other Meter
Non-Return
PRV
PSV
Sluice Line Valve Open/Closed
Butterfly Line Valve Open/Closed
Sluice Boundary Valve Open/Closed
Butterfly Boundary Valve Open/Closed
Scour Valves
Single Air Control Valve
Double Air Control Valve
Water Stop Valves
Water Service Connections
Water Distribution Chambers
Water Network Junctions
Pressure Monitoring Point
Fire Hydrant
Fire Hydrant/Washout
Water Fittings
Cap
Reducer
Tap
Other Fittings

Sewer "Foul" Combined Network
Waste Water Treatment Plant
Waste Water Pumping Station
Sewer Mains Irish Water
Gravity - Combined
Gravity - Foul
Gravity - Unknown
Pumping - Combined
Pumping - Foul
Pumping - Unknown
Syphon - Combined
Syphon - Foul
Overflow
Sewer Mains Private
Gravity - Combined
Gravity - Foul
Gravity - Unknown
Pumping - Combined
Pumping - Foul
Pumping - Unknown
Syphon - Combined
Syphon - Foul
Overflow
Sewer Lateral Lines
Sewer Casings
Sewer Manholes
Standard
Backdrop
Cascade
Catchpit
Bifurcation
Hatchbox
Lamphole
Hydrobrake
Other Unknown
Discharge Type
Outfall
Overflow
Soakaway
Standard Outlet
Other Unknown
Cleanout Type
Rodding Eye
Flushing Structure
Other Unknown
Sewer Inlets
Catchpit
Gully
Standard
Other Unknown
Sewer Fittings
Vent/Col
Other Unknown

Storm Water Network
Surface Water Mains
Surface Gravity Mains
Surface Gravity Mains Private
Surface Water Pressurised Mains
Surface Water Pressurised Mains Private
Inlet Type
Gully
Standard
Other Unknown
Storm Manholes
Standard
Backdrop
Cascade
Catchpit
Bifurcation
Hatchbox
Lamphole
Hydrobrake
Other Unknown
Storm Culverts
Storm Clean Outs
Stormwater Chambers
Discharge Type
Outfall
Overflow
Soakaway
Other Unknown
Gas Networks Ireland
Transmission High Pressure Gasline
Distribution Medium Pressure Gasline
Distribution Low Pressure Gasline
ESB Networks
ESB HV Lines
HV Underground
HV Overhead
HV Abandoned
ESB MV/LV Lines
MV Overhead Three Phase
MV Overhead Single Phase
LV Overhead Three Phase
LV Overhead Single Phase
MV/LV Underground
Abandoned
Non Service Categories
Proposed
Under Construction
Out of Service
Decommissioned
Water Non Service Assets
Water Point Feature
Water Pipe
Water Structure
Waste Non Service Assets
Waste Point Feature
Sewer
Waste Structure

Appendix B Existing and Proposed Diversion Flooding Comparison

Appendix B.1 Existing

Appendix B.2 Diversion

Appendix B.1 Existing

Results for 1 year +10% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	24	47.873	1.473	829.0	134.1201	0.0000	SURCHARGED
15 minute summer	5	24	47.763	1.603	760.3	2.8319	0.0000	SURCHARGED
15 minute summer	4	24	47.730	1.610	760.2	2.8440	0.0000	SURCHARGED
15 minute summer	3	24	47.360	1.300	760.1	2.2963	0.0000	SURCHARGED
15 minute summer	2	24	46.603	0.843	759.9	1.4903	0.0000	SURCHARGED
15 minute summer	1	24	46.332	0.782	759.9	1.3814	0.0000	SURCHARGED
15 minute summer	7	24	45.967	0.548	759.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	760.3	1.407	0.518	13.0550	
15 minute summer	5	1.001	4	760.2	1.055	0.360	2.8432	
15 minute summer	4	1.002	3	760.1	2.699	1.764	4.2891	
15 minute summer	3	1.003	2	759.9	2.698	1.385	13.2676	
15 minute summer	2	1.004	1	759.9	2.698	0.641	2.0050	
15 minute summer	1	1.005	7	759.8	2.699	1.104	3.6118	1043.9

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Results for 1 year +10% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	6	24	48.304	1.904	928.5	173.3515	0.0000	SURCHARGED
15 minute winter	5	25	48.169	2.009	841.7	3.5501	0.0000	SURCHARGED
15 minute winter	4	25	48.129	2.009	841.4	3.5492	0.0000	SURCHARGED
15 minute winter	3	25	47.676	1.616	841.1	2.8550	0.0000	SURCHARGED
15 minute winter	2	25	46.750	0.990	841.3	1.7491	0.0000	SURCHARGED
15 minute winter	1	25	46.417	0.867	841.4	1.5319	0.0000	SURCHARGED
15 minute winter	7	25	45.980	0.561	841.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	6	1.000	5	841.7	1.558	0.573	13.0550	
15 minute winter	5	1.001	4	841.4	1.168	0.399	2.8432	
15 minute winter	4	1.002	3	841.1	2.986	1.952	4.2891	
15 minute winter	3	1.003	2	841.3	2.987	1.533	13.2676	
15 minute winter	2	1.004	1	841.4	2.987	0.710	2.0050	
15 minute winter	1	1.005	7	841.4	2.988	1.222	3.6390	1170.2

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Results for 1 year +10% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	6	32	48.718	2.318	1017.2	211.0246	0.0000	SURCHARGED
30 minute summer	5	32	48.558	2.398	913.6	4.2379	0.0000	SURCHARGED
30 minute summer	4	32	48.510	2.390	913.3	4.2240	0.0000	SURCHARGED
30 minute summer	3	32	47.976	1.916	913.1	3.3864	0.0000	SURCHARGED
30 minute summer	2	32	46.885	1.125	912.8	1.9887	0.0000	SURCHARGED
30 minute summer	1	32	46.494	0.944	912.7	1.6672	0.0000	SURCHARGED
30 minute summer	7	30	45.987	0.568	912.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	6	1.000	5	913.6	1.691	0.622	13.0550	
30 minute summer	5	1.001	4	913.3	1.268	0.433	2.8432	
30 minute summer	4	1.002	3	913.1	3.242	2.119	4.2891	
30 minute summer	3	1.003	2	912.8	3.241	1.664	13.2676	
30 minute summer	2	1.004	1	912.7	3.241	0.770	2.0050	
30 minute summer	1	1.005	7	912.7	3.241	1.326	3.6524	1435.2

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Results for 1 year +10% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	6	32	49.246	2.846	1143.3	259.0886	0.0000	SURCHARGED
30 minute winter	5	32	49.056	2.896	997.5	5.1170	0.0000	SURCHARGED
30 minute winter	4	32	48.999	2.879	997.5	5.0868	0.0000	SURCHARGED
30 minute winter	3	32	48.362	2.302	997.4	4.0672	0.0000	SURCHARGED
30 minute winter	2	32	47.060	1.300	997.4	2.2966	0.0000	SURCHARGED
30 minute winter	1	32	46.592	1.042	997.3	1.8409	0.0000	SURCHARGED
30 minute winter	7	26	45.987	0.568	997.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	6	1.000	5	997.5	1.846	0.679	13.0550	
30 minute winter	5	1.001	4	997.5	1.385	0.472	2.8432	
30 minute winter	4	1.002	3	997.4	3.541	2.315	4.2891	
30 minute winter	3	1.003	2	997.4	3.541	1.818	13.2676	
30 minute winter	2	1.004	1	997.3	3.541	0.842	2.0050	
30 minute winter	1	1.005	7	997.3	3.541	1.449	3.6524	1609.1

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Results for 1 year +10% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	6	47	48.912	2.512	1071.6	228.6832	0.0000	SURCHARGED
60 minute summer	5	47	48.741	2.581	945.0	4.5611	0.0000	SURCHARGED
60 minute summer	4	47	48.690	2.570	945.0	4.5413	0.0000	SURCHARGED
60 minute summer	3	47	48.118	2.058	944.9	3.6370	0.0000	SURCHARGED
60 minute summer	2	47	46.950	1.190	944.9	2.1023	0.0000	SURCHARGED
60 minute summer	1	47	46.530	0.980	944.9	1.7313	0.0000	SURCHARGED
60 minute summer	7	43	45.987	0.568	944.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	6	1.000	5	945.0	1.749	0.644	13.0550	
60 minute summer	5	1.001	4	945.0	1.312	0.448	2.8432	
60 minute summer	4	1.002	3	944.9	3.355	2.193	4.2891	
60 minute summer	3	1.003	2	944.9	3.355	1.722	13.2676	
60 minute summer	2	1.004	1	944.9	3.355	0.797	2.0050	
60 minute summer	1	1.005	7	944.8	3.355	1.372	3.6524	1913.8

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Results for 1 year +10% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	6	47	49.188	2.788	1137.3	253.7641	0.0000	SURCHARGED
60 minute winter	5	47	49.001	2.841	988.6	5.0199	0.0000	SURCHARGED
60 minute winter	4	47	48.945	2.825	988.3	4.9917	0.0000	SURCHARGED
60 minute winter	3	47	48.319	2.259	988.4	3.9924	0.0000	SURCHARGED
60 minute winter	2	47	47.041	1.281	988.5	2.2631	0.0000	SURCHARGED
60 minute winter	1	47	46.581	1.031	988.5	1.8220	0.0000	SURCHARGED
60 minute winter	7	41	45.987	0.568	988.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	6	1.000	5	988.6	1.829	0.673	13.0550	
60 minute winter	5	1.001	4	988.3	1.372	0.468	2.8432	
60 minute winter	4	1.002	3	988.4	3.509	2.294	4.2891	
60 minute winter	3	1.003	2	988.5	3.510	1.802	13.2676	
60 minute winter	2	1.004	1	988.5	3.510	0.834	2.0050	
60 minute winter	1	1.005	7	988.6	3.510	1.436	3.6524	2143.2

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
120 minute summer	6	78	48.482	2.082	968.0	189.5779	0.0000	SURCHARGED
120 minute summer	5	78	48.337	2.177	872.2	3.8471	0.0000	SURCHARGED
120 minute summer	4	78	48.294	2.174	872.5	3.8406	0.0000	SURCHARGED
120 minute summer	3	78	47.806	1.746	872.8	3.0850	0.0000	SURCHARGED
120 minute summer	2	78	46.809	1.049	873.0	1.8535	0.0000	SURCHARGED
120 minute summer	1	78	46.450	0.900	873.1	1.5911	0.0000	SURCHARGED
120 minute summer	7	78	45.984	0.565	873.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	6	1.000	5	872.2	1.614	0.594	13.0550	
120 minute summer	5	1.001	4	872.5	1.211	0.413	2.8432	
120 minute summer	4	1.002	3	872.8	3.099	2.026	4.2891	
120 minute summer	3	1.003	2	873.0	3.100	1.591	13.2676	
120 minute summer	2	1.004	1	873.1	3.100	0.737	2.0050	
120 minute summer	1	1.005	7	873.2	3.100	1.268	3.6465	2506.7

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Results for 1 year +10% CC 120 minute winter. 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 (m³)	Flood (m³)	Status
120 minute winter	6	78	48.237	1.837	889.3	167.2345	0.0000	SURCHARGED
120 minute winter	5	78	48.106	1.946	828.7	3.4381	0.0000	SURCHARGED
120 minute winter	4	78	48.066	1.946	828.8	3.4392	0.0000	SURCHARGED
120 minute winter	3	78	47.626	1.566	828.9	2.7679	0.0000	SURCHARGED
120 minute winter	2	78	46.727	0.967	829.0	1.7092	0.0000	SURCHARGED
120 minute winter	1	78	46.404	0.854	829.0	1.5092	0.0000	SURCHARGED
120 minute winter	7	78	45.978	0.559	829.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	6	1.000	5	828.7	1.534	0.564	13.0550	
120 minute winter	5	1.001	4	828.8	1.151	0.393	2.8432	
120 minute winter	4	1.002	3	828.9	2.943	1.924	4.2891	
120 minute winter	3	1.003	2	829.0	2.943	1.511	13.2676	
120 minute winter	2	1.004	1	829.0	2.943	0.699	2.0050	
120 minute winter	1	1.005	7	829.0	2.943	1.204	3.6361	2808.5

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
180 minute summer	6	108	47.949	1.549	829.5	141.0083	0.0000	SURCHARGED
180 minute summer	5	108	47.834	1.674	775.1	2.9578	0.0000	SURCHARGED
180 minute summer	4	108	47.799	1.679	774.9	2.9676	0.0000	SURCHARGED
180 minute summer	3	108	47.415	1.355	774.7	2.3943	0.0000	SURCHARGED
180 minute summer	2	108	46.630	0.870	774.5	1.5365	0.0000	SURCHARGED
180 minute summer	1	108	46.347	0.797	774.4	1.4090	0.0000	SURCHARGED
180 minute summer	7	108	45.970	0.551	774.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	6	1.000	5	775.1	1.434	0.528	13.0550	
180 minute summer	5	1.001	4	774.9	1.076	0.367	2.8432	
180 minute summer	4	1.002	3	774.7	2.751	1.798	4.2891	
180 minute summer	3	1.003	2	774.5	2.750	1.412	13.2676	
180 minute summer	2	1.004	1	774.4	2.750	0.653	2.0050	
180 minute summer	1	1.005	7	774.3	2.750	1.125	3.6192	2926.9

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Results for 1 year +10% CC 180 minute winter. 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 (m³)	Flood (m³)	Status
180 minute winter	6	108	47.495	1.095	719.4	99.6450	0.0000	SURCHARGED
180 minute winter	5	108	47.403	1.243	691.3	2.1965	0.0000	SURCHARGED
180 minute winter	4	108	47.376	1.256	691.2	2.2187	0.0000	SURCHARGED
180 minute winter	3	108	47.070	1.010	691.0	1.7843	0.0000	SURCHARGED
180 minute winter	2	108	46.444	0.684	690.9	1.2088	0.0000	SURCHARGED
180 minute winter	1	108	46.218	0.668	691.9	1.1807	0.0000	SURCHARGED
180 minute winter	7	108	45.889	0.470	689.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	6	1.000	5	691.3	1.279	0.471	13.0550	
180 minute winter	5	1.001	4	691.2	0.960	0.327	2.8432	
180 minute winter	4	1.002	3	691.0	2.453	1.604	4.2891	
180 minute winter	3	1.003	2	690.9	2.453	1.259	13.2676	
180 minute winter	2	1.004	1	691.9	2.457	0.584	2.0050	
180 minute winter	1	1.005	7	689.0	2.547	1.001	3.3969	3275.2

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
240 minute summer	6	140	47.574	1.174	748.4	106.8461	0.0000	SURCHARGED
240 minute summer	5	140	47.480	1.320	699.3	2.3331	0.0000	SURCHARGED
240 minute summer	4	140	47.452	1.332	699.1	2.3543	0.0000	SURCHARGED
240 minute summer	3	140	47.139	1.079	699.4	1.9072	0.0000	SURCHARGED
240 minute summer	2	140	46.499	0.739	699.5	1.3065	0.0000	SURCHARGED
240 minute summer	1	140	46.269	0.719	699.6	1.2709	0.0000	SURCHARGED
240 minute summer	7	140	45.953	0.534	699.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	6	1.000	5	699.3	1.294	0.476	13.0550	
240 minute summer	5	1.001	4	699.1	0.971	0.331	2.8432	
240 minute summer	4	1.002	3	699.4	2.483	1.623	4.2891	
240 minute summer	3	1.003	2	699.5	2.484	1.275	13.2676	
240 minute summer	2	1.004	1	699.6	2.484	0.590	2.0050	
240 minute summer	1	1.005	7	699.7	2.553	1.016	3.5794	3257.1

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Results for 1 year +10% CC 240 minute winter. 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 (m³)	Flood (m³)	Status
240 minute winter	6	136	47.068	0.668	618.0	60.7942	0.0000	SURCHARGED
240 minute winter	5	136	46.997	0.837	607.4	1.4793	0.0000	SURCHARGED
240 minute winter	4	136	46.976	0.856	607.3	1.5126	0.0000	SURCHARGED
240 minute winter	3	136	46.740	0.680	607.2	1.2013	0.0000	SURCHARGED
240 minute winter	2	136	46.269	0.509	607.0	0.8986	0.0000	OK
240 minute winter	1	136	46.083	0.533	606.9	0.9418	0.0000	OK
240 minute winter	7	136	45.841	0.422	606.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	6	1.000	5	607.4	1.256	0.414	13.0550	
240 minute winter	5	1.001	4	607.3	0.843	0.288	2.8432	
240 minute winter	4	1.002	3	607.2	2.156	1.409	4.2891	
240 minute winter	3	1.003	2	607.0	2.179	1.106	12.6313	
240 minute winter	2	1.004	1	606.9	2.336	0.512	1.8479	
240 minute winter	1	1.005	7	606.8	2.523	0.881	3.1203	3653.2

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
360 minute summer	6	200	47.031	0.631	620.0	57.4128	0.0000	SURCHARGED
360 minute summer	5	200	46.964	0.804	595.0	1.4199	0.0000	SURCHARGED
360 minute summer	4	200	46.943	0.823	595.2	1.4547	0.0000	SURCHARGED
360 minute summer	3	200	46.717	0.657	595.3	1.1605	0.0000	SURCHARGED
360 minute summer	2	200	46.259	0.499	595.6	0.8823	0.0000	OK
360 minute summer	1	200	46.074	0.524	595.9	0.9265	0.0000	OK
360 minute summer	7	200	45.835	0.416	596.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	6	1.000	5	595.0	1.257	0.405	13.0550	
360 minute summer	5	1.001	4	595.2	0.826	0.282	2.8432	
360 minute summer	4	1.002	3	595.3	2.114	1.382	4.2891	
360 minute summer	3	1.003	2	595.6	2.175	1.085	12.5369	
360 minute summer	2	1.004	1	595.9	2.327	0.503	1.8216	
360 minute summer	1	1.005	7	596.1	2.515	0.866	3.0777	3787.1

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Results for 1 year +10% CC 360 minute winter. 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 (m³)	Flood (m³)	Status
360 minute winter	6	192	46.732	0.332	487.3	30.1964	0.0000	OK
360 minute winter	5	192	46.726	0.566	484.8	0.9999	0.0000	OK
360 minute winter	4	192	46.715	0.595	484.3	1.0510	0.0000	OK
360 minute winter	3	192	46.533	0.473	484.2	0.8352	0.0000	OK
360 minute winter	2	192	46.174	0.414	483.9	0.7317	0.0000	OK
360 minute winter	1	192	45.995	0.445	483.7	0.7863	0.0000	OK
360 minute winter	7	192	45.779	0.360	483.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	6	1.000	5	484.8	1.253	0.330	9.7607	
360 minute winter	5	1.001	4	484.3	0.703	0.229	2.7478	
360 minute winter	4	1.002	3	484.2	1.829	1.124	3.9549	
360 minute winter	3	1.003	2	483.9	2.168	0.882	10.4946	
360 minute winter	2	1.004	1	483.7	2.240	0.408	1.5361	
360 minute winter	1	1.005	7	483.6	2.407	0.702	2.6239	4243.4

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
480 minute summer	6	256	46.799	0.399	529.4	36.3407	0.0000	OK
480 minute summer	5	256	46.789	0.629	527.6	1.1116	0.0000	SURCHARGED
480 minute summer	4	256	46.773	0.653	527.5	1.1541	0.0000	SURCHARGED
480 minute summer	3	256	46.575	0.515	527.5	0.9093	0.0000	OK
480 minute summer	2	256	46.206	0.446	527.3	0.7880	0.0000	OK
480 minute summer	1	256	46.024	0.474	527.2	0.8383	0.0000	OK
480 minute summer	7	256	45.800	0.381	527.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	6	1.000	5	527.6	1.254	0.359	10.8685	
480 minute summer	5	1.001	4	527.5	0.732	0.250	2.8432	
480 minute summer	4	1.002	3	527.5	1.887	1.224	4.1032	
480 minute summer	3	1.003	2	527.3	2.181	0.961	11.3489	
480 minute summer	2	1.004	1	527.2	2.273	0.445	1.6501	
480 minute summer	1	1.005	7	527.2	2.452	0.766	2.8027	4212.0

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Results for 1 year +10% CC 480 minute winter. 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 (m³)	Flood (m³)	Status
480 minute winter	6	256	46.656	0.256	408.4	23.2713	0.0000	OK
480 minute winter	5	256	46.632	0.472	408.4	0.8337	0.0000	OK
480 minute winter	4	256	46.621	0.501	408.4	0.8852	0.0000	OK
480 minute winter	3	256	46.473	0.413	408.4	0.7292	0.0000	OK
480 minute winter	2	256	46.121	0.361	408.4	0.6387	0.0000	OK
480 minute winter	1	256	45.946	0.396	408.4	0.6993	0.0000	OK
480 minute winter	7	256	45.743	0.324	408.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	6	1.000	5	408.4	1.252	0.278	7.9104	
480 minute winter	5	1.001	4	408.4	0.700	0.193	2.3038	
480 minute winter	4	1.002	3	408.4	1.774	0.948	3.4874	
480 minute winter	3	1.003	2	408.4	2.125	0.744	9.0447	
480 minute winter	2	1.004	1	408.4	2.180	0.345	1.3330	
480 minute winter	1	1.005	7	408.4	2.316	0.593	2.3064	4720.2

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
600 minute summer	6	315	46.705	0.305	467.7	27.7858	0.0000	OK
600 minute summer	5	315	46.694	0.534	462.4	0.9441	0.0000	OK
600 minute summer	4	315	46.683	0.563	461.5	0.9951	0.0000	OK
600 minute summer	3	315	46.513	0.453	461.0	0.8008	0.0000	OK
600 minute summer	2	315	46.157	0.397	460.3	0.7019	0.0000	OK
600 minute summer	1	315	45.979	0.429	459.7	0.7585	0.0000	OK
600 minute summer	7	315	45.767	0.348	459.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	6	1.000	5	462.4	1.250	0.315	9.1294	
600 minute summer	5	1.001	4	461.5	0.701	0.219	2.5991	
600 minute summer	4	1.002	3	461.0	1.812	1.070	3.8298	
600 minute summer	3	1.003	2	460.3	2.156	0.839	10.0415	
600 minute summer	2	1.004	1	459.7	2.221	0.388	1.4725	
600 minute summer	1	1.005	7	459.5	2.379	0.667	2.5240	4591.3

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Results for 1 year +10% CC 600 minute winter. 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 (m³)	Flood (m³)	Status
600 minute winter	6	315	46.617	0.217	357.9	19.7845	0.0000	OK
600 minute winter	5	315	46.578	0.418	357.2	0.7389	0.0000	OK
600 minute winter	4	315	46.568	0.448	357.1	0.7917	0.0000	OK
600 minute winter	3	315	46.435	0.375	357.0	0.6628	0.0000	OK
600 minute winter	2	315	46.086	0.326	356.8	0.5764	0.0000	OK
600 minute winter	1	315	45.912	0.362	356.7	0.6399	0.0000	OK
600 minute winter	7	315	45.717	0.298	356.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	6	1.000	5	357.2	1.249	0.243	6.9106	
600 minute winter	5	1.001	4	357.1	0.687	0.169	2.0513	
600 minute winter	4	1.002	3	357.0	1.733	0.829	3.1295	
600 minute winter	3	1.003	2	356.8	2.087	0.650	8.0505	
600 minute winter	2	1.004	1	356.7	2.134	0.301	1.1897	
600 minute winter	1	1.005	7	356.7	2.244	0.518	2.0807	5155.0

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
720 minute summer	6	375	46.666	0.266	424.9	24.2499	0.0000	OK
720 minute summer	5	375	46.646	0.486	421.5	0.8579	0.0000	OK
720 minute summer	4	375	46.635	0.515	420.8	0.9092	0.0000	OK
720 minute summer	3	375	46.482	0.422	420.5	0.7450	0.0000	OK
720 minute summer	2	375	46.129	0.369	419.9	0.6523	0.0000	OK
720 minute summer	1	375	45.953	0.403	419.4	0.7120	0.0000	OK
720 minute summer	7	375	45.748	0.329	419.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	6	1.000	5	421.5	1.253	0.287	8.1762	
720 minute summer	5	1.001	4	420.8	0.701	0.199	2.3683	
720 minute summer	4	1.002	3	420.5	1.783	0.976	3.5696	
720 minute summer	3	1.003	2	419.9	2.132	0.765	9.2672	
720 minute summer	2	1.004	1	419.4	2.189	0.354	1.3635	
720 minute summer	1	1.005	7	419.2	2.330	0.609	2.3534	4908.5

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Results for 1 year +10% CC 720 minute winter. 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 (m³)	Flood (m³)	Status
720 minute winter	6	375	46.592	0.192	319.8	17.5217	0.0000	OK
720 minute winter	5	375	46.541	0.381	319.4	0.6738	0.0000	OK
720 minute winter	4	375	46.532	0.412	319.3	0.7279	0.0000	OK
720 minute winter	3	375	46.408	0.348	319.2	0.6152	0.0000	OK
720 minute winter	2	375	46.060	0.300	319.1	0.5309	0.0000	OK
720 minute winter	1	375	45.887	0.337	319.0	0.5960	0.0000	OK
720 minute winter	7	375	45.699	0.280	319.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	6	1.000	5	319.4	1.237	0.217	6.2396	
720 minute winter	5	1.001	4	319.3	0.671	0.151	1.8785	
720 minute winter	4	1.002	3	319.2	1.697	0.741	2.8611	
720 minute winter	3	1.003	2	319.1	2.054	0.582	7.3163	
720 minute winter	2	1.004	1	319.0	2.097	0.269	1.0828	
720 minute winter	1	1.005	7	319.0	2.186	0.463	1.9114	5508.0

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
960 minute summer	6	495	46.618	0.218	359.9	19.8493	0.0000	OK
960 minute summer	5	495	46.579	0.419	358.2	0.7402	0.0000	OK
960 minute summer	4	495	46.569	0.449	357.9	0.7929	0.0000	OK
960 minute summer	3	495	46.436	0.376	357.7	0.6637	0.0000	OK
960 minute summer	2	495	46.086	0.326	357.3	0.5768	0.0000	OK
960 minute summer	1	495	45.912	0.362	357.0	0.6403	0.0000	OK
960 minute summer	7	495	45.718	0.299	356.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute summer	6	1.000	5	358.2	1.249	0.244	6.9266	
960 minute summer	5	1.001	4	357.9	0.687	0.170	2.0549	
960 minute summer	4	1.002	3	357.7	1.733	0.830	3.1344	
960 minute summer	3	1.003	2	357.3	2.087	0.651	8.0603	
960 minute summer	2	1.004	1	357.0	2.134	0.301	1.1907	
960 minute summer	1	1.005	7	356.9	2.244	0.518	2.0820	5450.2

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Results for 1 year +10% CC 960 minute winter. 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 (m³)	Flood (m³)	Status
960 minute winter	6	495	46.561	0.161	267.0	14.6430	0.0000	OK
960 minute winter	5	495	46.492	0.332	266.8	0.5859	0.0000	OK
960 minute winter	4	495	46.483	0.363	266.7	0.6423	0.0000	OK
960 minute winter	3	495	46.371	0.311	266.7	0.5493	0.0000	OK
960 minute winter	2	495	46.024	0.264	266.7	0.4669	0.0000	OK
960 minute winter	1	495	45.852	0.302	266.6	0.5334	0.0000	OK
960 minute winter	7	495	45.672	0.253	266.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	6	1.000	5	266.8	1.204	0.182	5.3548	
960 minute winter	5	1.001	4	266.7	0.640	0.126	1.6460	
960 minute winter	4	1.002	3	266.7	1.636	0.619	2.4814	
960 minute winter	3	1.003	2	266.7	1.999	0.486	6.2854	
960 minute winter	2	1.004	1	266.6	2.040	0.225	0.9306	
960 minute winter	1	1.005	7	266.6	2.094	0.387	1.6685	6113.4

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Results for 1 year +10% 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 (m³)	Flood (m³)	Status
1440 minute summer	6	750	46.564	0.164	272.8	14.9585	0.0000	OK
1440 minute summer	5	750	46.497	0.337	272.8	0.5959	0.0000	OK
1440 minute summer	4	750	46.489	0.369	272.8	0.6519	0.0000	OK
1440 minute summer	3	750	46.375	0.315	272.8	0.5570	0.0000	OK
1440 minute summer	2	750	46.029	0.269	272.8	0.4745	0.0000	OK
1440 minute summer	1	750	45.856	0.306	272.8	0.5409	0.0000	OK
1440 minute summer	7	750	45.675	0.256	272.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	6	1.000	5	272.8	1.208	0.186	5.4539	
1440 minute summer	5	1.001	4	272.8	0.644	0.129	1.6724	
1440 minute summer	4	1.002	3	272.8	1.644	0.633	2.5255	
1440 minute summer	3	1.003	2	272.8	2.006	0.497	6.4066	
1440 minute summer	2	1.004	1	272.8	2.047	0.230	0.9488	
1440 minute summer	1	1.005	7	272.8	2.106	0.396	1.6977	6281.3

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Results for 1 year +10% CC 1440 minute winter. 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 (m³)	Flood (m³)	Status
1440 minute winter	6	750	46.526	0.126	205.3	11.4477	0.0000	OK
1440 minute winter	5	750	46.436	0.276	205.3	0.4881	0.0000	OK
1440 minute winter	4	750	46.430	0.310	205.3	0.5479	0.0000	OK
1440 minute winter	3	750	46.326	0.266	205.3	0.4704	0.0000	OK
1440 minute winter	2	750	45.981	0.221	205.3	0.3899	0.0000	OK
1440 minute winter	1	750	45.808	0.258	205.3	0.4561	0.0000	OK
1440 minute winter	7	750	45.638	0.219	205.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	6	1.000	5	205.3	1.135	0.140	4.3710	
1440 minute winter	5	1.001	4	205.3	0.584	0.097	1.3885	
1440 minute winter	4	1.002	3	205.3	1.535	0.477	2.0373	
1440 minute winter	3	1.003	2	205.3	1.915	0.374	5.0552	
1440 minute winter	2	1.004	1	205.3	1.959	0.173	0.7468	
1440 minute winter	1	1.005	7	205.3	1.966	0.298	1.3694	7066.0

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Results for 1 year +10% CC 2160 minute summer. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	6	1140	46.525	0.125	204.1	11.3867	0.0000	OK
2160 minute summer	5	1140	46.435	0.275	204.1	0.4861	0.0000	OK
2160 minute summer	4	1140	46.429	0.309	204.1	0.5460	0.0000	OK
2160 minute summer	3	1140	46.325	0.265	204.1	0.4689	0.0000	OK
2160 minute summer	2	1140	45.980	0.220	204.1	0.3884	0.0000	OK
2160 minute summer	1	1140	45.807	0.257	204.1	0.4545	0.0000	OK
2160 minute summer	7	1140	45.638	0.219	204.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	6	1.000	5	204.1	1.133	0.139	4.3516	
2160 minute summer	5	1.001	4	204.1	0.582	0.097	1.3833	
2160 minute summer	4	1.002	3	204.1	1.533	0.474	2.0284	
2160 minute summer	3	1.003	2	204.1	1.913	0.372	5.0308	
2160 minute summer	2	1.004	1	204.1	1.957	0.172	0.7431	
2160 minute summer	1	1.005	7	204.1	1.963	0.296	1.3633	7253.0

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Results for 1 year +10% CC 2160 minute winter. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	6	1140	46.502	0.102	157.5	9.2620	0.0000	OK
2160 minute winter	5	1140	46.391	0.231	157.5	0.4075	0.0000	OK
2160 minute winter	4	1140	46.386	0.266	157.5	0.4704	0.0000	OK
2160 minute winter	3	1140	46.290	0.230	157.5	0.4055	0.0000	OK
2160 minute winter	2	1140	45.945	0.185	157.5	0.3271	0.0000	OK
2160 minute winter	1	1140	45.771	0.221	157.5	0.3909	0.0000	OK
2160 minute winter	7	1140	45.610	0.191	157.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	6	1.000	5	157.5	1.053	0.107	3.6144	
2160 minute winter	5	1.001	4	157.5	0.528	0.075	1.1766	
2160 minute winter	4	1.002	3	157.5	1.434	0.366	1.6731	
2160 minute winter	3	1.003	2	157.5	1.825	0.287	4.0710	
2160 minute winter	2	1.004	1	157.5	1.877	0.133	0.5981	
2160 minute winter	1	1.005	7	157.5	1.841	0.229	1.1217	8169.0

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Results for 1 year +10% CC 2880 minute summer. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	6	1500	46.509	0.109	175.2	9.9341	0.0000	OK
2880 minute summer	5	1500	46.408	0.248	175.2	0.4381	0.0000	OK
2880 minute summer	4	1500	46.403	0.283	175.2	0.4998	0.0000	OK
2880 minute summer	3	1500	46.303	0.243	175.2	0.4301	0.0000	OK
2880 minute summer	2	1500	45.959	0.199	175.2	0.3508	0.0000	OK
2880 minute summer	1	1500	45.785	0.235	175.2	0.4157	0.0000	OK
2880 minute summer	7	1500	45.621	0.202	175.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	6	1.000	5	175.2	1.090	0.119	3.8826	
2880 minute summer	5	1.001	4	175.2	0.550	0.083	1.2570	
2880 minute summer	4	1.002	3	175.2	1.474	0.407	1.8105	
2880 minute summer	3	1.003	2	175.2	1.862	0.319	4.4394	
2880 minute summer	2	1.004	1	175.2	1.909	0.148	0.6538	
2880 minute summer	1	1.005	7	175.2	1.890	0.254	1.2153	8065.8

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Results for 1 year +10% CC 2880 minute winter. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	6	1500	46.491	0.091	131.9	8.2594	0.0000	OK
2880 minute winter	5	1500	46.365	0.205	131.9	0.3615	0.0000	OK
2880 minute winter	4	1500	46.361	0.241	131.9	0.4260	0.0000	OK
2880 minute winter	3	1500	46.269	0.209	131.9	0.3685	0.0000	OK
2880 minute winter	2	1500	45.925	0.165	131.9	0.2917	0.0000	OK
2880 minute winter	1	1500	45.750	0.200	131.9	0.3534	0.0000	OK
2880 minute winter	7	1500	45.593	0.174	131.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	6	1.000	5	131.9	0.992	0.090	3.2115	
2880 minute winter	5	1.001	4	131.9	0.493	0.062	1.0555	
2880 minute winter	4	1.002	3	131.9	1.369	0.306	1.4683	
2880 minute winter	3	1.003	2	131.9	1.765	0.240	3.5311	
2880 minute winter	2	1.004	1	131.9	1.822	0.111	0.5163	
2880 minute winter	1	1.005	7	131.9	1.762	0.192	0.9818	9078.1

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Results for 1 year +10% CC 4320 minute summer. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute summer	6	2220	46.494	0.094	138.4	8.5187	0.0000	OK
4320 minute summer	5	2220	46.371	0.211	138.4	0.3735	0.0000	OK
4320 minute summer	4	2220	46.368	0.248	138.4	0.4375	0.0000	OK
4320 minute summer	3	2220	46.274	0.214	138.4	0.3781	0.0000	OK
4320 minute summer	2	2220	45.930	0.170	138.4	0.3008	0.0000	OK
4320 minute summer	1	2220	45.756	0.205	138.4	0.3631	0.0000	OK
4320 minute summer	7	2220	45.597	0.178	138.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute summer	6	1.000	5	138.4	1.008	0.094	3.3159	
4320 minute summer	5	1.001	4	138.4	0.503	0.066	1.0869	
4320 minute summer	4	1.002	3	138.4	1.387	0.321	1.5211	
4320 minute summer	3	1.003	2	138.4	1.781	0.252	3.6689	
4320 minute summer	2	1.004	1	138.4	1.837	0.117	0.5372	
4320 minute summer	1	1.005	7	138.4	1.783	0.201	1.0179	9345.0

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Results for 1 year +10% CC 4320 minute winter. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute winter	6	2220	46.477	0.077	102.1	7.0111	0.0000	OK
4320 minute winter	5	2220	46.332	0.172	102.1	0.3039	0.0000	OK
4320 minute winter	4	2220	46.330	0.210	102.1	0.3704	0.0000	OK
4320 minute winter	3	2220	46.242	0.182	102.1	0.3222	0.0000	OK
4320 minute winter	2	2220	45.901	0.141	102.1	0.2484	0.0000	OK
4320 minute winter	1	2220	45.723	0.173	102.1	0.3061	0.0000	OK
4320 minute winter	7	2220	45.572	0.153	102.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute winter	6	1.000	5	102.1	0.911	0.070	2.7078	
4320 minute winter	5	1.001	4	102.1	0.446	0.048	0.9038	
4320 minute winter	4	1.002	3	102.1	1.278	0.237	1.2172	
4320 minute winter	3	1.003	2	102.1	1.675	0.186	2.8828	
4320 minute winter	2	1.004	1	102.1	1.743	0.086	0.4180	
4320 minute winter	1	1.005	7	102.1	1.651	0.148	0.8106	10501.5

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Results for 1 year +10% CC 5760 minute summer. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute summer	6	2940	46.484	0.084	117.4	7.6660	0.0000	OK
5760 minute summer	5	2940	46.349	0.189	117.4	0.3341	0.0000	OK
5760 minute summer	4	2940	46.346	0.226	117.4	0.3996	0.0000	OK
5760 minute summer	3	2940	46.256	0.196	117.4	0.3466	0.0000	OK
5760 minute summer	2	2940	45.913	0.153	117.4	0.2710	0.0000	OK
5760 minute summer	1	2940	45.737	0.187	117.4	0.3309	0.0000	OK
5760 minute summer	7	2940	45.583	0.164	117.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
5760 minute summer	6	1.000	5	117.4	0.954	0.080	2.9721	
5760 minute summer	5	1.001	4	117.4	0.471	0.056	0.9834	
5760 minute summer	4	1.002	3	117.4	1.327	0.273	1.3482	
5760 minute summer	3	1.003	2	117.4	1.724	0.214	3.2191	
5760 minute summer	2	1.004	1	117.4	1.787	0.099	0.4689	
5760 minute summer	1	1.005	7	117.4	1.711	0.171	0.8998	10352.4

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Results for 1 year +10% CC 5760 minute winter. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute winter	6	2940	46.469	0.069	85.1	6.2454	0.0000	OK
5760 minute winter	5	2940	46.312	0.152	85.1	0.2683	0.0000	OK
5760 minute winter	4	2940	46.310	0.190	85.1	0.3360	0.0000	OK
5760 minute winter	3	2940	46.226	0.166	85.1	0.2934	0.0000	OK
5760 minute winter	2	2940	45.886	0.126	85.1	0.2221	0.0000	OK
5760 minute winter	1	2940	45.707	0.157	85.1	0.2769	0.0000	OK
5760 minute winter	7	2940	45.559	0.140	85.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
5760 minute winter	6	1.000	5	85.1	0.858	0.058	2.3974	
5760 minute winter	5	1.001	4	85.1	0.433	0.040	0.8099	
5760 minute winter	4	1.002	3	85.1	1.217	0.198	1.0662	
5760 minute winter	3	1.003	2	85.1	1.611	0.155	2.5012	
5760 minute winter	2	1.004	1	85.1	1.687	0.072	0.3603	
5760 minute winter	1	1.005	7	85.1	1.577	0.124	0.7078	11629.3

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Results for 1 year +10% CC 7200 minute summer. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute summer	6	3660	46.477	0.077	102.0	7.0067	0.0000	OK
7200 minute summer	5	3660	46.332	0.172	102.0	0.3037	0.0000	OK
7200 minute summer	4	3660	46.330	0.210	102.0	0.3702	0.0000	OK
7200 minute summer	3	3660	46.242	0.182	102.0	0.3220	0.0000	OK
7200 minute summer	2	3660	45.900	0.140	102.0	0.2482	0.0000	OK
7200 minute summer	1	3660	45.723	0.173	102.0	0.3059	0.0000	OK
7200 minute summer	7	3660	45.572	0.153	102.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
7200 minute summer	6	1.000	5	102.0	0.911	0.069	2.7061	
7200 minute summer	5	1.001	4	102.0	0.446	0.048	0.9032	
7200 minute summer	4	1.002	3	102.0	1.278	0.237	1.2164	
7200 minute summer	3	1.003	2	102.0	1.674	0.186	2.8806	
7200 minute summer	2	1.004	1	102.0	1.743	0.086	0.4176	
7200 minute summer	1	1.005	7	102.0	1.651	0.148	0.8100	11212.2

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Results for 1 year +10% CC 7200 minute winter. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute winter	6	3660	46.463	0.063	73.7	5.7032	0.0000	OK
7200 minute winter	5	3660	46.297	0.137	73.7	0.2429	0.0000	OK
7200 minute winter	4	3660	46.296	0.176	73.7	0.3113	0.0000	OK
7200 minute winter	3	3660	46.214	0.154	73.7	0.2728	0.0000	OK
7200 minute winter	2	3660	45.875	0.115	73.7	0.2037	0.0000	OK
7200 minute winter	1	3660	45.695	0.145	73.7	0.2560	0.0000	OK
7200 minute winter	7	3660	45.549	0.130	73.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
7200 minute winter	6	1.000	5	73.7	0.818	0.050	2.1759	
7200 minute winter	5	1.001	4	73.7	0.425	0.035	0.7427	
7200 minute winter	4	1.002	3	73.7	1.170	0.171	0.9605	
7200 minute winter	3	1.003	2	73.7	1.560	0.134	2.2386	
7200 minute winter	2	1.004	1	73.7	1.642	0.062	0.3207	
7200 minute winter	1	1.005	7	73.7	1.519	0.107	0.6359	12586.6

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Results for 1 year +10% CC 8640 minute summer. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute summer	6	4380	46.471	0.071	90.6	6.4992	0.0000	OK
8640 minute summer	5	4380	46.319	0.159	90.6	0.2801	0.0000	OK
8640 minute summer	4	4380	46.317	0.197	90.6	0.3474	0.0000	OK
8640 minute summer	3	4380	46.231	0.171	90.6	0.3029	0.0000	OK
8640 minute summer	2	4380	45.891	0.131	90.6	0.2308	0.0000	OK
8640 minute summer	1	4380	45.712	0.162	90.6	0.2865	0.0000	OK
8640 minute summer	7	4380	45.563	0.144	90.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute summer	6	1.000	5	90.6	0.875	0.062	2.5004	
8640 minute summer	5	1.001	4	90.6	0.434	0.043	0.8411	
8640 minute summer	4	1.002	3	90.6	1.238	0.210	1.1156	
8640 minute summer	3	1.003	2	90.6	1.633	0.165	2.6248	
8640 minute summer	2	1.004	1	90.6	1.707	0.076	0.3791	
8640 minute summer	1	1.005	7	90.6	1.601	0.132	0.7416	11959.8

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Results for 1 year +10% CC 8640 minute winter. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute winter	6	4380	46.458	0.058	65.5	5.2956	0.0000	OK
8640 minute winter	5	4380	46.287	0.127	65.5	0.2236	0.0000	OK
8640 minute winter	4	4380	46.286	0.166	65.5	0.2925	0.0000	OK
8640 minute winter	3	4380	46.206	0.146	65.5	0.2571	0.0000	OK
8640 minute winter	2	4380	45.868	0.108	65.5	0.1901	0.0000	OK
8640 minute winter	1	4380	45.686	0.136	65.5	0.2401	0.0000	OK
8640 minute winter	7	4380	45.541	0.122	65.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute winter	6	1.000	5	65.5	0.788	0.045	2.0086	
8640 minute winter	5	1.001	4	65.5	0.428	0.031	0.6918	
8640 minute winter	4	1.002	3	65.5	1.132	0.152	0.8818	
8640 minute winter	3	1.003	2	65.5	1.517	0.119	2.0447	
8640 minute winter	2	1.004	1	65.5	1.604	0.055	0.2917	
8640 minute winter	1	1.005	7	65.5	1.474	0.095	0.5828	13425.8

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Results for 1 year +10% CC 10080 minute summer. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute summer	6	5100	46.467	0.067	82.0	6.0994	0.0000	OK
10080 minute summer	5	5100	46.308	0.148	82.0	0.2616	0.0000	OK
10080 minute summer	4	5100	46.306	0.186	82.0	0.3294	0.0000	OK
10080 minute summer	3	5100	46.223	0.163	82.0	0.2879	0.0000	OK
10080 minute summer	2	5100	45.883	0.123	82.0	0.2172	0.0000	OK
10080 minute summer	1	5100	45.704	0.154	82.0	0.2713	0.0000	OK
10080 minute summer	7	5100	45.556	0.137	82.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
10080 minute summer	6	1.000	5	82.0	0.847	0.056	2.3382	
10080 minute summer	5	1.001	4	82.0	0.429	0.039	0.7920	
10080 minute summer	4	1.002	3	82.0	1.205	0.190	1.0377	
10080 minute summer	3	1.003	2	82.0	1.598	0.149	2.4302	
10080 minute summer	2	1.004	1	82.0	1.675	0.069	0.3496	
10080 minute summer	1	1.005	7	82.0	1.562	0.119	0.6886	12622.6

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Results for 1 year +10% CC 10080 minute winter. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	6	5100	46.455	0.055	59.2	4.9685	0.0000	OK
10080 minute winter	5	5100	46.278	0.118	59.2	0.2081	0.0000	OK
10080 minute winter	4	5100	46.277	0.157	59.2	0.2775	0.0000	OK
10080 minute winter	3	5100	46.198	0.138	59.2	0.2444	0.0000	OK
10080 minute winter	2	5100	45.861	0.101	59.2	0.1791	0.0000	OK
10080 minute winter	1	5100	45.679	0.129	59.2	0.2273	0.0000	OK
10080 minute winter	7	5100	45.536	0.117	59.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
10080 minute winter	6	1.000	5	59.2	0.763	0.040	1.8743	
10080 minute winter	5	1.001	4	59.2	0.438	0.028	0.6508	
10080 minute winter	4	1.002	3	59.2	1.101	0.137	0.8197	
10080 minute winter	3	1.003	2	59.2	1.483	0.108	1.8935	
10080 minute winter	2	1.004	1	59.2	1.572	0.050	0.2690	
10080 minute winter	1	1.005	7	59.2	1.435	0.086	0.5408	14157.2

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
15 minute summer	6	16	50.500	4.100	1844.3	373.2435	412.2259	FLOOD
15 minute summer	5	18	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
15 minute summer	4	18	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
15 minute summer	3	18	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
15 minute summer	2	16	47.475	1.715	1173.7	3.0306	0.0000	SURCHARGED
15 minute summer	1	16	46.827	1.277	1174.7	2.2559	0.0000	SURCHARGED
15 minute summer	7	12	45.987	0.568	1175.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
15 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
15 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
15 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
15 minute summer	2	1.004	1	1174.7	4.171	0.991	2.0050	
15 minute summer	1	1.005	7	1175.9	4.175	1.708	3.6524	1915.4

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Results for 30 year +10% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	6	15	50.500	4.100	2065.7	373.2435	611.1130	FLOOD
15 minute winter	5	15	50.237	4.077	1187.8	7.2037	0.0000	FLOOD RISK
15 minute winter	4	15	50.158	4.038	1173.7	7.1349	0.0000	FLOOD RISK
15 minute winter	3	15	49.276	3.216	1173.8	5.6826	0.0000	SURCHARGED
15 minute winter	2	15	47.473	1.713	1174.0	3.0268	0.0000	SURCHARGED
15 minute winter	1	15	46.825	1.275	1173.7	2.2527	0.0000	SURCHARGED
15 minute winter	7	12	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	6	1.000	5	1187.8	2.198	0.809	13.0550	
15 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
15 minute winter	4	1.002	3	1173.8	4.168	2.725	4.2891	
15 minute winter	3	1.003	2	1174.0	4.168	2.140	13.2676	
15 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
15 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	1980.1

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
30 minute summer	6	21	50.500	4.100	2251.3	373.2435	855.5925	FLOOD
30 minute summer	5	22	50.236	4.076	1175.9	7.2031	0.0000	FLOOD RISK
30 minute summer	4	22	50.157	4.037	1174.7	7.1342	0.0000	FLOOD RISK
30 minute summer	3	22	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
30 minute summer	2	23	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
30 minute summer	1	23	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
30 minute summer	7	18	45.987	0.568	1174.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	6	1.000	5	1175.9	2.176	0.801	13.0550	
30 minute summer	5	1.001	4	1174.7	1.631	0.556	2.8432	
30 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
30 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
30 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
30 minute summer	1	1.005	7	1174.3	4.169	1.706	3.6524	2325.5

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Results for 30 year +10% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	6	20	50.500	4.100	2530.5	373.2435	1134.1130	FLOOD
30 minute winter	5	22	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
30 minute winter	4	22	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
30 minute winter	3	20	49.279	3.219	1173.7	5.6873	0.0000	SURCHARGED
30 minute winter	2	20	47.483	1.723	1175.3	3.0445	0.0000	SURCHARGED
30 minute winter	1	20	46.832	1.282	1176.6	2.2653	0.0000	SURCHARGED
30 minute winter	7	18	45.987	0.568	1177.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
30 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
30 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
30 minute winter	3	1.003	2	1175.3	4.173	2.142	13.2676	
30 minute winter	2	1.004	1	1176.6	4.178	0.993	2.0050	
30 minute winter	1	1.005	7	1177.2	4.180	1.710	3.6524	2440.5

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Results for 30 year +10% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	6	35	50.500	4.100	2316.4	373.2435	960.9550	FLOOD
60 minute summer	5	35	50.237	4.077	1175.5	7.2041	0.0000	FLOOD RISK
60 minute summer	4	35	50.158	4.038	1174.8	7.1350	0.0000	FLOOD RISK
60 minute summer	3	36	49.275	3.215	1174.2	5.6815	0.0000	SURCHARGED
60 minute summer	2	37	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
60 minute summer	1	37	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
60 minute summer	7	32	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	6	1.000	5	1175.5	2.175	0.801	13.0550	
60 minute summer	5	1.001	4	1174.8	1.631	0.556	2.8432	
60 minute summer	4	1.002	3	1174.2	4.169	2.725	4.2891	
60 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
60 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
60 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	3171.6

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Results for 30 year +10% CC 60 minute winter. 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 (m³)	Flood (m³)	Status
60 minute winter	6	33	50.500	4.100	2458.3	373.2435	1215.8830	FLOOD
60 minute winter	5	33	50.251	4.091	1174.3	7.2284	0.0000	FLOOD RISK
60 minute winter	4	33	50.173	4.053	1176.3	7.1611	0.0000	FLOOD RISK
60 minute winter	3	33	49.291	3.231	1178.2	5.7093	0.0000	SURCHARGED
60 minute winter	2	35	47.473	1.713	1175.5	3.0261	0.0000	SURCHARGED
60 minute winter	1	35	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
60 minute winter	7	29	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	6	1.000	5	1174.3	2.173	0.800	13.0550	
60 minute winter	5	1.001	4	1176.3	1.633	0.557	2.8432	
60 minute winter	4	1.002	3	1178.2	4.183	2.735	4.2891	
60 minute winter	3	1.003	2	1175.5	4.174	2.142	13.2676	
60 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
60 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	3434.0

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
120 minute summer	6	66	50.500	4.100	2030.5	373.2435	744.2180	FLOOD
120 minute summer	5	68	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
120 minute summer	4	68	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
120 minute summer	3	68	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
120 minute summer	2	66	47.473	1.713	1173.7	3.0262	0.0000	SURCHARGED
120 minute summer	1	66	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
120 minute summer	7	60	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
120 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
120 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
120 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
120 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
120 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	4502.2

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Results for 30 year +10% CC 120 minute winter. 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 (m³)	Flood (m³)	Status
120 minute winter	6	64	50.500	4.100	1865.5	373.2435	752.5280	FLOOD
120 minute winter	5	66	50.236	4.076	1182.1	7.2031	0.0000	FLOOD RISK
120 minute winter	4	66	50.157	4.037	1173.8	7.1342	0.0000	FLOOD RISK
120 minute winter	3	66	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
120 minute winter	2	64	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
120 minute winter	1	64	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
120 minute winter	7	56	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	6	1.000	5	1182.1	2.187	0.805	13.0550	
120 minute winter	5	1.001	4	1173.8	1.630	0.556	2.8432	
120 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
120 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
120 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
120 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	5117.5

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
180 minute summer	6	100	50.500	4.100	1704.6	373.2435	426.4675	FLOOD
180 minute summer	5	100	50.236	4.076	1182.7	7.2031	0.0000	FLOOD RISK
180 minute summer	4	100	50.157	4.037	1174.7	7.1342	0.0000	FLOOD RISK
180 minute summer	3	100	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
180 minute summer	2	100	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
180 minute summer	1	100	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
180 minute summer	7	92	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	6	1.000	5	1182.7	2.189	0.805	13.0550	
180 minute summer	5	1.001	4	1174.7	1.631	0.556	2.8432	
180 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
180 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
180 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
180 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	5535.2

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Results for 30 year +10% CC 180 minute winter. 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 (m³)	Flood (m³)	Status
180 minute winter	6	96	50.500	4.100	1478.5	373.2435	337.9803	FLOOD
180 minute winter	5	100	50.236	4.076	1173.9	7.2031	0.0000	FLOOD RISK
180 minute winter	4	100	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
180 minute winter	3	100	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
180 minute winter	2	96	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
180 minute winter	1	96	46.825	1.275	1173.8	2.2524	0.0000	SURCHARGED
180 minute winter	7	88	45.987	0.568	1174.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	6	1.000	5	1173.9	2.172	0.799	13.0550	
180 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
180 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
180 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
180 minute winter	2	1.004	1	1173.8	4.168	0.990	2.0050	
180 minute winter	1	1.005	7	1174.2	4.169	1.705	3.6524	6422.5

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
240 minute summer	6	132	50.500	4.100	1514.1	373.2435	222.0661	FLOOD
240 minute summer	5	132	50.236	4.076	1180.7	7.2031	0.0000	FLOOD RISK
240 minute summer	4	132	50.157	4.037	1175.2	7.1342	0.0000	FLOOD RISK
240 minute summer	3	132	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
240 minute summer	2	132	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
240 minute summer	1	132	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
240 minute summer	7	120	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	6	1.000	5	1180.7	2.185	0.804	13.0550	
240 minute summer	5	1.001	4	1175.2	1.632	0.557	2.8432	
240 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
240 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
240 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
240 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	6348.2

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Results for 30 year +10% CC 240 minute winter. 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 (m³)	Flood (m³)	Status
240 minute winter	6	140	50.500	4.100	1250.3	373.2435	7.7469	FLOOD
240 minute winter	5	140	50.236	4.076	1175.3	7.2031	0.0000	FLOOD RISK
240 minute winter	4	140	50.157	4.037	1174.2	7.1342	0.0000	FLOOD RISK
240 minute winter	3	140	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
240 minute winter	2	140	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
240 minute winter	1	140	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
240 minute winter	7	116	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	6	1.000	5	1175.3	2.175	0.800	13.0550	
240 minute winter	5	1.001	4	1174.2	1.630	0.556	2.8432	
240 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
240 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
240 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
240 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	7378.0

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
360 minute summer	6	200	50.235	3.835	1228.5	349.1188	0.0000	FLOOD RISK
360 minute summer	5	200	49.986	3.826	1139.5	6.7614	0.0000	SURCHARGED
360 minute summer	4	200	49.912	3.792	1139.1	6.7005	0.0000	SURCHARGED
360 minute summer	3	200	49.081	3.021	1138.8	5.3389	0.0000	SURCHARGED
360 minute summer	2	200	47.385	1.625	1138.5	2.8707	0.0000	SURCHARGED
360 minute summer	1	200	46.775	1.225	1138.4	2.1646	0.0000	SURCHARGED
360 minute summer	7	184	45.987	0.568	1138.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	6	1.000	5	1139.5	2.109	0.776	13.0550	
360 minute summer	5	1.001	4	1139.1	1.582	0.540	2.8432	
360 minute summer	4	1.002	3	1138.8	4.043	2.643	4.2891	
360 minute summer	3	1.003	2	1138.5	4.042	2.075	13.2676	
360 minute summer	2	1.004	1	1138.4	4.042	0.961	2.0050	
360 minute summer	1	1.005	7	1138.3	4.042	1.653	3.6524	7505.2

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Results for 30 year +10% CC 360 minute winter. 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 (m³)	Flood (m³)	Status
360 minute winter	6	200	48.901	2.501	965.6	227.6652	0.0000	SURCHARGED
360 minute winter	5	200	48.731	2.571	943.3	4.5422	0.0000	SURCHARGED
360 minute winter	4	200	48.680	2.560	943.2	4.5227	0.0000	SURCHARGED
360 minute winter	3	200	48.110	2.050	943.1	3.6222	0.0000	SURCHARGED
360 minute winter	2	200	46.946	1.186	943.0	2.0956	0.0000	SURCHARGED
360 minute winter	1	200	46.528	0.978	943.0	1.7276	0.0000	SURCHARGED
360 minute winter	7	192	45.987	0.568	943.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	6	1.000	5	943.3	1.746	0.642	13.0550	
360 minute winter	5	1.001	4	943.2	1.310	0.447	2.8432	
360 minute winter	4	1.002	3	943.1	3.349	2.189	4.2891	
360 minute winter	3	1.003	2	943.0	3.348	1.719	13.2676	
360 minute winter	2	1.004	1	943.0	3.348	0.796	2.0050	
360 minute winter	1	1.005	7	943.0	3.348	1.370	3.6524	8404.7

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
480 minute summer	6	256	49.155	2.755	1032.5	250.8254	0.0000	SURCHARGED
480 minute summer	5	256	48.969	2.809	985.2	4.9639	0.0000	SURCHARGED
480 minute summer	4	256	48.914	2.794	984.3	4.9363	0.0000	SURCHARGED
480 minute summer	3	256	48.294	2.234	983.5	3.9471	0.0000	SURCHARGED
480 minute summer	2	264	47.029	1.269	983.1	2.2431	0.0000	SURCHARGED
480 minute summer	1	264	46.575	1.025	983.4	1.8108	0.0000	SURCHARGED
480 minute summer	7	248	45.987	0.568	983.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	6	1.000	5	985.2	1.823	0.671	13.0550	
480 minute summer	5	1.001	4	984.3	1.367	0.466	2.8432	
480 minute summer	4	1.002	3	983.5	3.492	2.283	4.2891	
480 minute summer	3	1.003	2	983.1	3.491	1.792	13.2676	
480 minute summer	2	1.004	1	983.4	3.491	0.830	2.0050	
480 minute summer	1	1.005	7	983.5	3.492	1.429	3.6524	8210.2

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Results for 30 year +10% CC 480 minute winter. 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 (m³)	Flood (m³)	Status
480 minute winter	6	256	48.013	1.613	796.5	146.8022	0.0000	SURCHARGED
480 minute winter	5	256	47.894	1.734	787.1	3.0639	0.0000	SURCHARGED
480 minute winter	4	256	47.858	1.738	787.0	3.0718	0.0000	SURCHARGED
480 minute winter	3	256	47.462	1.402	786.8	2.4772	0.0000	SURCHARGED
480 minute winter	2	256	46.652	0.892	786.7	1.5757	0.0000	SURCHARGED
480 minute winter	1	256	46.361	0.811	786.6	1.4324	0.0000	SURCHARGED
480 minute winter	7	264	45.973	0.554	786.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	6	1.000	5	787.1	1.457	0.536	13.0550	
480 minute winter	5	1.001	4	787.0	1.093	0.373	2.8432	
480 minute winter	4	1.002	3	786.8	2.794	1.826	4.2891	
480 minute winter	3	1.003	2	786.7	2.793	1.434	13.2676	
480 minute winter	2	1.004	1	786.6	2.793	0.664	2.0050	
480 minute winter	1	1.005	7	786.7	2.793	1.143	3.6255	9210.9

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
600 minute summer	6	315	48.303	1.903	895.2	173.1963	0.0000	SURCHARGED
600 minute summer	5	315	48.166	2.006	842.6	3.5450	0.0000	SURCHARGED
600 minute summer	4	330	48.126	2.006	841.6	3.5441	0.0000	SURCHARGED
600 minute summer	3	330	47.674	1.614	840.7	2.8513	0.0000	SURCHARGED
600 minute summer	2	330	46.749	0.989	841.0	1.7479	0.0000	SURCHARGED
600 minute summer	1	330	46.417	0.867	841.2	1.5312	0.0000	SURCHARGED
600 minute summer	7	330	45.980	0.561	841.3	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	6	1.000	5	842.6	1.559	0.574	13.0550	
600 minute summer	5	1.001	4	841.6	1.169	0.399	2.8432	
600 minute summer	4	1.002	3	840.7	2.985	1.951	4.2891	
600 minute summer	3	1.003	2	841.0	2.986	1.533	13.2676	
600 minute summer	2	1.004	1	841.2	2.987	0.710	2.0050	
600 minute summer	1	1.005	7	841.3	2.987	1.222	3.6390	8766.9

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Results for 30 year +10% CC 600 minute winter. 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 (m³)	Flood (m³)	Status
600 minute winter	6	330	47.387	0.987	685.1	89.8936	0.0000	SURCHARGED
600 minute winter	5	330	47.301	1.141	673.2	2.0158	0.0000	SURCHARGED
600 minute winter	4	330	47.275	1.155	673.3	2.0405	0.0000	SURCHARGED
600 minute winter	3	330	46.985	0.925	673.4	1.6336	0.0000	SURCHARGED
600 minute winter	2	330	46.398	0.638	673.4	1.1269	0.0000	SURCHARGED
600 minute winter	1	330	46.187	0.637	673.5	1.1247	0.0000	SURCHARGED
600 minute winter	7	330	45.879	0.460	673.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	6	1.000	5	673.2	1.252	0.458	13.0550	
600 minute winter	5	1.001	4	673.3	0.935	0.319	2.8432	
600 minute winter	4	1.002	3	673.4	2.391	1.563	4.2891	
600 minute winter	3	1.003	2	673.4	2.391	1.227	13.2676	
600 minute winter	2	1.004	1	673.5	2.391	0.568	2.0050	
600 minute winter	1	1.005	7	673.5	2.549	0.978	3.3642	9860.4

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
720 minute summer	6	375	47.893	1.493	806.0	135.8876	0.0000	SURCHARGED
720 minute summer	5	375	47.780	1.620	765.2	2.8630	0.0000	SURCHARGED
720 minute summer	4	375	47.747	1.627	764.5	2.8744	0.0000	SURCHARGED
720 minute summer	3	375	47.373	1.313	763.7	2.3196	0.0000	SURCHARGED
720 minute summer	2	375	46.609	0.849	763.1	1.5003	0.0000	SURCHARGED
720 minute summer	1	375	46.335	0.785	762.9	1.3873	0.0000	SURCHARGED
720 minute summer	7	390	45.967	0.548	763.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	6	1.000	5	765.2	1.416	0.521	13.0550	
720 minute summer	5	1.001	4	764.5	1.061	0.362	2.8432	
720 minute summer	4	1.002	3	763.7	2.712	1.773	4.2891	
720 minute summer	3	1.003	2	763.1	2.710	1.391	13.2676	
720 minute summer	2	1.004	1	762.9	2.709	0.644	2.0050	
720 minute summer	1	1.005	7	763.0	2.710	1.108	3.6134	9305.1

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Results for 30 year +10% CC 720 minute winter. 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 (m³)	Flood (m³)	Status
720 minute winter	6	375	47.052	0.652	606.6	59.3500	0.0000	SURCHARGED
720 minute winter	5	375	46.983	0.823	602.3	1.4535	0.0000	SURCHARGED
720 minute winter	4	375	46.962	0.842	602.2	1.4874	0.0000	SURCHARGED
720 minute winter	3	375	46.730	0.670	602.2	1.1830	0.0000	SURCHARGED
720 minute winter	2	375	46.264	0.504	602.0	0.8911	0.0000	OK
720 minute winter	1	375	46.079	0.529	601.9	0.9347	0.0000	OK
720 minute winter	7	375	45.838	0.419	601.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	6	1.000	5	602.3	1.252	0.410	13.0550	
720 minute winter	5	1.001	4	602.2	0.836	0.285	2.8432	
720 minute winter	4	1.002	3	602.2	2.138	1.398	4.2891	
720 minute winter	3	1.003	2	602.0	2.181	1.097	12.5883	
720 minute winter	2	1.004	1	601.9	2.332	0.508	1.8360	
720 minute winter	1	1.005	7	601.8	2.519	0.874	3.1008	10442.3

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
960 minute summer	6	495	47.247	0.847	672.9	77.1202	0.0000	SURCHARGED
960 minute summer	5	495	47.165	1.005	654.4	1.7758	0.0000	SURCHARGED
960 minute summer	4	495	47.140	1.020	654.1	1.8031	0.0000	SURCHARGED
960 minute summer	3	495	46.866	0.806	653.8	1.4250	0.0000	SURCHARGED
960 minute summer	2	495	46.315	0.555	653.5	0.9807	0.0000	OK
960 minute summer	1	495	46.126	0.576	653.1	1.0176	0.0000	OK
960 minute summer	7	495	45.867	0.448	652.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute summer	6	1.000	5	654.4	1.250	0.446	13.0550	
960 minute summer	5	1.001	4	654.1	0.908	0.310	2.8432	
960 minute summer	4	1.002	3	653.8	2.321	1.518	4.2891	
960 minute summer	3	1.003	2	653.5	2.320	1.191	13.0449	
960 minute summer	2	1.004	1	653.1	2.373	0.551	1.9580	
960 minute summer	1	1.005	7	652.9	2.550	0.948	3.2975	10178.4

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Results for 30 year +10% CC 960 minute winter. 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 (m³)	Flood (m³)	Status
960 minute winter	6	495	46.750	0.350	499.2	31.8276	0.0000	OK
960 minute winter	5	495	46.746	0.586	498.4	1.0358	0.0000	OK
960 minute winter	4	495	46.734	0.614	498.2	1.0841	0.0000	SURCHARGED
960 minute winter	3	495	46.545	0.485	498.2	0.8568	0.0000	OK
960 minute winter	2	495	46.184	0.424	498.1	0.7500	0.0000	OK
960 minute winter	1	495	46.005	0.455	498.0	0.8033	0.0000	OK
960 minute winter	7	495	45.786	0.367	498.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	6	1.000	5	498.4	1.251	0.339	10.1764	
960 minute winter	5	1.001	4	498.2	0.702	0.236	2.8098	
960 minute winter	4	1.002	3	498.2	1.843	1.156	4.0023	
960 minute winter	3	1.003	2	498.1	2.174	0.908	10.7660	
960 minute winter	2	1.004	1	498.0	2.251	0.420	1.5739	
960 minute winter	1	1.005	7	498.0	2.422	0.723	2.6833	11427.9

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Results for 30 year +10% 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 (m³)	Flood (m³)	Status
1440 minute summer	6	750	46.752	0.352	499.8	32.0104	0.0000	OK
1440 minute summer	5	750	46.748	0.588	499.8	1.0398	0.0000	OK
1440 minute summer	4	750	46.735	0.615	499.8	1.0874	0.0000	SURCHARGED
1440 minute summer	3	750	46.546	0.486	499.8	0.8593	0.0000	OK
1440 minute summer	2	750	46.186	0.426	499.8	0.7522	0.0000	OK
1440 minute summer	1	750	46.006	0.456	499.8	0.8054	0.0000	OK
1440 minute summer	7	750	45.787	0.368	499.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	6	1.000	5	499.8	1.248	0.340	10.2225	
1440 minute summer	5	1.001	4	499.8	0.700	0.237	2.8151	
1440 minute summer	4	1.002	3	499.8	1.845	1.160	4.0075	
1440 minute summer	3	1.003	2	499.8	2.175	0.911	10.7986	
1440 minute summer	2	1.004	1	499.8	2.253	0.422	1.5785	
1440 minute summer	1	1.005	7	499.8	2.424	0.726	2.6907	11503.1

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Results for 30 year +10% CC 1440 minute winter. 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 (m³)	Flood (m³)	Status
1440 minute winter	6	750	46.631	0.231	376.2	21.0118	0.0000	OK
1440 minute winter	5	750	46.598	0.438	376.2	0.7736	0.0000	OK
1440 minute winter	4	750	46.587	0.467	376.2	0.8258	0.0000	OK
1440 minute winter	3	750	46.449	0.389	376.2	0.6874	0.0000	OK
1440 minute winter	2	750	46.099	0.339	376.2	0.5998	0.0000	OK
1440 minute winter	1	750	45.925	0.375	376.2	0.6624	0.0000	OK
1440 minute winter	7	750	45.727	0.308	376.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	6	1.000	5	376.2	1.250	0.256	7.2708	
1440 minute winter	5	1.001	4	376.2	0.693	0.178	2.1437	
1440 minute winter	4	1.002	3	376.2	1.749	0.873	3.2650	
1440 minute winter	3	1.003	2	376.2	2.102	0.686	8.4244	
1440 minute winter	2	1.004	1	376.2	2.152	0.317	1.2442	
1440 minute winter	1	1.005	7	376.2	2.273	0.546	2.1667	12945.4

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Results for 30 year +10% CC 2160 minute summer. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	6	1140	46.624	0.224	366.1	20.3500	0.0000	OK
2160 minute summer	5	1140	46.587	0.427	366.1	0.7553	0.0000	OK
2160 minute summer	4	1140	46.577	0.457	366.1	0.8078	0.0000	OK
2160 minute summer	3	1140	46.442	0.382	366.1	0.6744	0.0000	OK
2160 minute summer	2	1140	46.093	0.333	366.1	0.5876	0.0000	OK
2160 minute summer	1	1140	45.918	0.368	366.1	0.6508	0.0000	OK
2160 minute summer	7	1140	45.722	0.303	366.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	6	1.000	5	366.1	1.250	0.249	7.0788	
2160 minute summer	5	1.001	4	366.1	0.690	0.173	2.0948	
2160 minute summer	4	1.002	3	366.1	1.740	0.850	3.1940	
2160 minute summer	3	1.003	2	366.1	2.094	0.667	8.2292	
2160 minute summer	2	1.004	1	366.1	2.143	0.309	1.2160	
2160 minute summer	1	1.005	7	366.1	2.258	0.532	2.1222	13003.0

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Results for 30 year +10% CC 2160 minute winter. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	6	1140	46.570	0.170	282.5	15.4762	0.0000	OK
2160 minute winter	5	1140	46.506	0.346	282.5	0.6120	0.0000	OK
2160 minute winter	4	1140	46.498	0.378	282.5	0.6676	0.0000	OK
2160 minute winter	3	1140	46.382	0.322	282.5	0.5692	0.0000	OK
2160 minute winter	2	1140	46.035	0.275	282.5	0.4864	0.0000	OK
2160 minute winter	1	1140	45.863	0.313	282.5	0.5526	0.0000	OK
2160 minute winter	7	1140	45.680	0.261	282.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	6	1.000	5	282.5	1.215	0.192	5.6151	
2160 minute winter	5	1.001	4	282.5	0.650	0.134	1.7151	
2160 minute winter	4	1.002	3	282.5	1.656	0.656	2.5961	
2160 minute winter	3	1.003	2	282.5	2.017	0.515	6.5980	
2160 minute winter	2	1.004	1	282.5	2.058	0.238	0.9771	
2160 minute winter	1	1.005	7	282.5	2.124	0.410	1.7432	14645.6

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Results for 30 year +10% CC 2880 minute summer. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	6	1500	46.586	0.186	309.1	16.9366	0.0000	OK
2880 minute summer	5	1500	46.532	0.372	309.1	0.6566	0.0000	OK
2880 minute summer	4	1500	46.522	0.402	309.1	0.7111	0.0000	OK
2880 minute summer	3	1500	46.401	0.341	309.1	0.6026	0.0000	OK
2880 minute summer	2	1500	46.054	0.294	309.1	0.5188	0.0000	OK
2880 minute summer	1	1500	45.881	0.331	309.1	0.5843	0.0000	OK
2880 minute summer	7	1500	45.694	0.275	309.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	6	1.000	5	309.1	1.231	0.211	6.0641	
2880 minute summer	5	1.001	4	309.1	0.666	0.146	1.8331	
2880 minute summer	4	1.002	3	309.1	1.686	0.717	2.7884	
2880 minute summer	3	1.003	2	309.1	2.044	0.563	7.1202	
2880 minute summer	2	1.004	1	309.1	2.087	0.261	1.0542	
2880 minute summer	1	1.005	7	309.1	2.170	0.449	1.8662	14227.4

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Results for 30 year +10% CC 2880 minute winter. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	6	1500	46.541	0.141	232.7	12.8524	0.0000	OK
2880 minute winter	5	1500	46.461	0.301	232.7	0.5321	0.0000	OK
2880 minute winter	4	1500	46.454	0.334	232.7	0.5903	0.0000	OK
2880 minute winter	3	1500	46.346	0.286	232.7	0.5061	0.0000	OK
2880 minute winter	2	1500	46.000	0.240	232.7	0.4247	0.0000	OK
2880 minute winter	1	1500	45.828	0.278	232.7	0.4913	0.0000	OK
2880 minute winter	7	1500	45.654	0.235	232.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	6	1.000	5	232.7	1.169	0.158	4.8097	
2880 minute winter	5	1.001	4	232.7	0.611	0.110	1.5043	
2880 minute winter	4	1.002	3	232.7	1.583	0.540	2.2377	
2880 minute winter	3	1.003	2	232.7	1.956	0.424	5.6079	
2880 minute winter	2	1.004	1	232.7	1.997	0.196	0.8297	
2880 minute winter	1	1.005	7	232.7	2.026	0.338	1.5051	16012.9

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Results for 30 year +10% CC 4320 minute summer. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute summer	6	2220	46.545	0.145	238.9	13.1739	0.0000	OK
4320 minute summer	5	2220	46.467	0.307	238.9	0.5419	0.0000	OK
4320 minute summer	4	2220	46.459	0.339	238.9	0.5998	0.0000	OK
4320 minute summer	3	2220	46.351	0.291	238.9	0.5140	0.0000	OK
4320 minute summer	2	2220	46.005	0.245	238.9	0.4325	0.0000	OK
4320 minute summer	1	2220	45.832	0.282	238.9	0.4991	0.0000	OK
4320 minute summer	7	2220	45.657	0.238	238.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute summer	6	1.000	5	238.9	1.176	0.163	4.9084	
4320 minute summer	5	1.001	4	238.9	0.616	0.113	1.5301	
4320 minute summer	4	1.002	3	238.9	1.594	0.555	2.2823	
4320 minute summer	3	1.003	2	238.9	1.964	0.435	5.7321	
4320 minute summer	2	1.004	1	238.9	2.005	0.202	0.8483	
4320 minute summer	1	1.005	7	238.9	2.039	0.347	1.5354	16125.6

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Results for 30 year +10% CC 4320 minute winter. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute winter	6	2220	46.510	0.110	176.2	9.9840	0.0000	OK
4320 minute winter	5	2220	46.409	0.249	176.2	0.4398	0.0000	OK
4320 minute winter	4	2220	46.404	0.284	176.2	0.5014	0.0000	OK
4320 minute winter	3	2220	46.304	0.244	176.2	0.4315	0.0000	OK
4320 minute winter	2	2220	45.959	0.199	176.2	0.3521	0.0000	OK
4320 minute winter	1	2220	45.786	0.236	176.2	0.4171	0.0000	OK
4320 minute winter	7	2220	45.621	0.202	176.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute winter	6	1.000	5	176.2	1.092	0.120	3.8990	
4320 minute winter	5	1.001	4	176.2	0.551	0.083	1.2614	
4320 minute winter	4	1.002	3	176.2	1.476	0.409	1.8182	
4320 minute winter	3	1.003	2	176.2	1.864	0.321	4.4601	
4320 minute winter	2	1.004	1	176.2	1.911	0.149	0.6569	
4320 minute winter	1	1.005	7	176.2	1.893	0.256	1.2205	18120.2

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Results for 30 year +10% CC 5760 minute summer. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute summer	6	2940	46.523	0.123	199.6	11.1586	0.0000	OK
5760 minute summer	5	2940	46.431	0.271	199.6	0.4787	0.0000	OK
5760 minute summer	4	2940	46.425	0.305	199.6	0.5389	0.0000	OK
5760 minute summer	3	2940	46.322	0.262	199.6	0.4629	0.0000	OK
5760 minute summer	2	2940	45.977	0.217	199.6	0.3826	0.0000	OK
5760 minute summer	1	2940	45.804	0.254	199.6	0.4486	0.0000	OK
5760 minute summer	7	2940	45.635	0.216	199.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
5760 minute summer	6	1.000	5	199.6	1.127	0.136	4.2791	
5760 minute summer	5	1.001	4	199.6	0.578	0.095	1.3639	
5760 minute summer	4	1.002	3	199.6	1.524	0.463	1.9949	
5760 minute summer	3	1.003	2	199.6	1.906	0.364	4.9395	
5760 minute summer	2	1.004	1	199.6	1.950	0.168	0.7293	
5760 minute summer	1	1.005	7	199.6	1.952	0.290	1.3406	17609.3

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Results for 30 year +10% CC 5760 minute winter. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute winter	6	2940	46.496	0.096	144.7	8.7681	0.0000	OK
5760 minute winter	5	2940	46.378	0.218	144.7	0.3849	0.0000	OK
5760 minute winter	4	2940	46.374	0.254	144.7	0.4485	0.0000	OK
5760 minute winter	3	2940	46.279	0.219	144.7	0.3873	0.0000	OK
5760 minute winter	2	2940	45.935	0.175	144.7	0.3095	0.0000	OK
5760 minute winter	1	2940	45.761	0.211	144.7	0.3724	0.0000	OK
5760 minute winter	7	2940	45.602	0.183	144.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
5760 minute winter	6	1.000	5	144.7	1.023	0.099	3.4158	
5760 minute winter	5	1.001	4	144.7	0.511	0.069	1.1169	
5760 minute winter	4	1.002	3	144.7	1.403	0.336	1.5718	
5760 minute winter	3	1.003	2	144.7	1.797	0.264	3.8025	
5760 minute winter	2	1.004	1	144.7	1.851	0.122	0.5574	
5760 minute winter	1	1.005	7	144.7	1.803	0.210	1.0524	19776.0

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Results for 30 year +10% CC 7200 minute summer. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute summer	6	3660	46.507	0.107	171.4	9.7835	0.0000	OK
7200 minute summer	5	3660	46.404	0.244	171.4	0.4316	0.0000	OK
7200 minute summer	4	3660	46.399	0.279	171.4	0.4935	0.0000	OK
7200 minute summer	3	3660	46.300	0.240	171.4	0.4249	0.0000	OK
7200 minute summer	2	3660	45.956	0.196	171.4	0.3457	0.0000	OK
7200 minute summer	1	3660	45.782	0.232	171.4	0.4105	0.0000	OK
7200 minute summer	7	3660	45.618	0.199	171.4	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
7200 minute summer	6	1.000	5	171.4	1.083	0.117	3.8247	
7200 minute summer	5	1.001	4	171.4	0.546	0.081	1.2399	
7200 minute summer	4	1.002	3	171.4	1.466	0.398	1.7812	
7200 minute summer	3	1.003	2	171.4	1.854	0.312	4.3607	
7200 minute summer	2	1.004	1	171.4	1.903	0.145	0.6420	
7200 minute summer	1	1.005	7	171.4	1.880	0.249	1.1955	18844.7

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Results for 30 year +10% CC 7200 minute winter. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute winter	6	3660	46.487	0.087	123.9	7.9354	0.0000	OK
7200 minute winter	5	3660	46.356	0.196	123.9	0.3466	0.0000	OK
7200 minute winter	4	3660	46.353	0.233	123.9	0.4116	0.0000	OK
7200 minute winter	3	3660	46.262	0.202	123.9	0.3566	0.0000	OK
7200 minute winter	2	3660	45.919	0.159	123.9	0.2803	0.0000	OK
7200 minute winter	1	3660	45.743	0.193	123.9	0.3411	0.0000	OK
7200 minute winter	7	3660	45.588	0.169	123.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
7200 minute winter	6	1.000	5	123.9	0.972	0.084	3.0806	
7200 minute winter	5	1.001	4	123.9	0.481	0.059	1.0161	
7200 minute winter	4	1.002	3	123.9	1.346	0.288	1.4025	
7200 minute winter	3	1.003	2	123.9	1.742	0.226	3.3595	
7200 minute winter	2	1.004	1	123.9	1.803	0.105	0.4902	
7200 minute winter	1	1.005	7	123.9	1.734	0.180	0.9369	21153.2

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Results for 30 year +10% CC 8640 minute summer. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute summer	6	4380	46.499	0.099	150.9	9.0094	0.0000	OK
8640 minute summer	5	4380	46.384	0.224	150.9	0.3959	0.0000	OK
8640 minute summer	4	4380	46.380	0.260	150.9	0.4592	0.0000	OK
8640 minute summer	3	4380	46.284	0.224	150.9	0.3962	0.0000	OK
8640 minute summer	2	4380	45.940	0.180	150.9	0.3181	0.0000	OK
8640 minute summer	1	4380	45.766	0.216	150.9	0.3814	0.0000	OK
8640 minute summer	7	4380	45.606	0.187	150.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute summer	6	1.000	5	150.9	1.038	0.103	3.5127	
8640 minute summer	5	1.001	4	150.9	0.520	0.071	1.1460	
8640 minute summer	4	1.002	3	150.9	1.419	0.350	1.6210	
8640 minute summer	3	1.003	2	150.9	1.811	0.275	3.9326	
8640 minute summer	2	1.004	1	150.9	1.864	0.127	0.5772	
8640 minute summer	1	1.005	7	150.9	1.822	0.219	1.0862	19920.2

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Results for 30 year +10% CC 8640 minute winter. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute winter	6	4380	46.480	0.080	109.1	7.3133	0.0000	OK
8640 minute winter	5	4380	46.340	0.180	109.1	0.3179	0.0000	OK
8640 minute winter	4	4380	46.337	0.217	109.1	0.3839	0.0000	OK
8640 minute winter	3	4380	46.249	0.189	109.1	0.3335	0.0000	OK
8640 minute winter	2	4380	45.906	0.146	109.1	0.2588	0.0000	OK
8640 minute winter	1	4380	45.730	0.180	109.1	0.3176	0.0000	OK
8640 minute winter	7	4380	45.577	0.158	109.1	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute winter	6	1.000	5	109.1	0.931	0.074	2.8301	
8640 minute winter	5	1.001	4	109.1	0.458	0.052	0.9407	
8640 minute winter	4	1.002	3	109.1	1.301	0.253	1.2778	
8640 minute winter	3	1.003	2	109.1	1.698	0.199	3.0373	
8640 minute winter	2	1.004	1	109.1	1.763	0.092	0.4414	
8640 minute winter	1	1.005	7	109.1	1.679	0.158	0.8518	22349.0

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Results for 30 year +10% CC 10080 minute summer. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute summer	6	5100	46.492	0.092	135.5	8.4026	0.0000	OK
10080 minute summer	5	5100	46.368	0.208	135.5	0.3682	0.0000	OK
10080 minute summer	4	5100	46.365	0.245	135.5	0.4324	0.0000	OK
10080 minute summer	3	5100	46.272	0.212	135.5	0.3738	0.0000	OK
10080 minute summer	2	5100	45.928	0.168	135.5	0.2967	0.0000	OK
10080 minute summer	1	5100	45.753	0.203	135.5	0.3588	0.0000	OK
10080 minute summer	7	5100	45.596	0.177	135.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
10080 minute summer	6	1.000	5	135.5	1.001	0.092	3.2693	
10080 minute summer	5	1.001	4	135.5	0.499	0.064	1.0730	
10080 minute summer	4	1.002	3	135.5	1.379	0.315	1.4975	
10080 minute summer	3	1.003	2	135.5	1.774	0.247	3.6073	
10080 minute summer	2	1.004	1	135.5	1.831	0.114	0.5279	
10080 minute summer	1	1.005	7	135.5	1.773	0.197	1.0019	20874.9

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Results for 30 year +10% CC 10080 minute winter. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	6	5100	46.475	0.075	98.0	6.8314	0.0000	OK
10080 minute winter	5	5100	46.327	0.167	98.0	0.2956	0.0000	OK
10080 minute winter	4	5100	46.325	0.205	98.0	0.3623	0.0000	OK
10080 minute winter	3	5100	46.239	0.178	98.0	0.3154	0.0000	OK
10080 minute winter	2	5100	45.897	0.137	98.0	0.2421	0.0000	OK
10080 minute winter	1	5100	45.719	0.169	98.0	0.2992	0.0000	OK
10080 minute winter	7	5100	45.569	0.150	98.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
10080 minute winter	6	1.000	5	98.0	0.899	0.067	2.6349	
10080 minute winter	5	1.001	4	98.0	0.439	0.046	0.8817	
10080 minute winter	4	1.002	3	98.0	1.264	0.227	1.1815	
10080 minute winter	3	1.003	2	98.0	1.660	0.179	2.7917	
10080 minute winter	2	1.004	1	98.0	1.730	0.083	0.4042	
10080 minute winter	1	1.005	7	98.0	1.634	0.142	0.7863	23413.7

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
15 minute summer	6	13	50.500	4.100	2397.9	373.2435	1018.7940	FLOOD
15 minute summer	5	13	50.250	4.090	1173.7	7.2272	0.0000	FLOOD RISK
15 minute summer	4	13	50.173	4.053	1173.7	7.1610	0.0000	FLOOD RISK
15 minute summer	3	13	49.297	3.237	1175.4	5.7204	0.0000	SURCHARGED
15 minute summer	2	13	47.478	1.718	1177.6	3.0355	0.0000	SURCHARGED
15 minute summer	1	13	46.827	1.277	1173.7	2.2569	0.0000	SURCHARGED
15 minute summer	7	11	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
15 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
15 minute summer	4	1.002	3	1175.4	4.173	2.728	4.2891	
15 minute summer	3	1.003	2	1177.6	4.181	2.146	13.2676	
15 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
15 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	2024.8

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Results for 100 year +10% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	6	13	50.500	4.100	2685.6	373.2435	1262.2160	FLOOD
15 minute winter	5	14	50.236	4.076	1220.8	7.2031	0.0000	FLOOD RISK
15 minute winter	4	14	50.157	4.037	1197.8	7.1342	0.0000	FLOOD RISK
15 minute winter	3	14	49.275	3.215	1175.2	5.6815	0.0000	SURCHARGED
15 minute winter	2	15	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
15 minute winter	1	15	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
15 minute winter	7	11	45.987	0.568	1173.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	6	1.000	5	1220.8	2.259	0.831	13.0550	
15 minute winter	5	1.001	4	1197.8	1.663	0.567	2.8432	
15 minute winter	4	1.002	3	1175.2	4.173	2.728	4.2891	
15 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
15 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
15 minute winter	1	1.005	7	1173.8	4.168	1.705	3.6524	2085.3

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Results for 100 year +10% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	6	19	50.500	4.100	2937.3	373.2435	1650.6970	FLOOD
30 minute summer	5	19	50.237	4.077	1176.7	7.2035	0.0000	FLOOD RISK
30 minute summer	4	19	50.157	4.037	1175.5	7.1342	0.0000	FLOOD RISK
30 minute summer	3	20	49.275	3.215	1174.3	5.6815	0.0000	SURCHARGED
30 minute summer	2	21	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
30 minute summer	1	21	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
30 minute summer	7	17	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	6	1.000	5	1176.7	2.178	0.801	13.0550	
30 minute summer	5	1.001	4	1175.5	1.632	0.557	2.8432	
30 minute summer	4	1.002	3	1174.3	4.169	2.726	4.2891	
30 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
30 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
30 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	2492.8

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Results for 100 year +10% CC 30 minute winter. 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 winter	6	18	50.500	4.100	3301.6	373.2435	2063.3360	FLOOD
30 minute winter	5	18	50.242	4.082	1173.7	7.2127	0.0000	FLOOD RISK
30 minute winter	4	18	50.164	4.044	1173.7	7.1462	0.0000	FLOOD RISK
30 minute winter	3	18	49.291	3.231	1173.7	5.7099	0.0000	SURCHARGED
30 minute winter	2	18	47.486	1.726	1178.0	3.0505	0.0000	SURCHARGED
30 minute winter	1	18	46.834	1.284	1176.8	2.2681	0.0000	SURCHARGED
30 minute winter	7	16	45.987	0.568	1175.5	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)
30 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
30 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
30 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
30 minute winter	3	1.003	2	1178.0	4.183	2.147	13.2676	
30 minute winter	2	1.004	1	1176.8	4.178	0.993	2.0050	
30 minute winter	1	1.005	7	1175.5	4.174	1.707	3.6524	2606.4

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Results for 100 year +10% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	6	32	50.500	4.100	3001.3	373.2435	1881.1320	FLOOD
60 minute summer	5	32	50.258	4.098	1188.4	7.2404	0.0000	FLOOD RISK
60 minute summer	4	32	50.179	4.059	1186.4	7.1720	0.0000	FLOOD RISK
60 minute summer	3	32	49.286	3.226	1183.5	5.7011	0.0000	SURCHARGED
60 minute summer	2	34	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
60 minute summer	1	34	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
60 minute summer	7	29	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	6	1.000	5	1188.4	2.199	0.809	13.0550	
60 minute summer	5	1.001	4	1186.4	1.647	0.562	2.8432	
60 minute summer	4	1.002	3	1183.5	4.202	2.747	4.2891	
60 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
60 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
60 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	3504.1

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Results for 100 year +10% CC 60 minute winter. 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 (m³)	Flood (m³)	Status
60 minute winter	6	30	50.500	4.100	3185.4	373.2435	2274.4520	FLOOD
60 minute winter	5	30	50.249	4.089	1173.7	7.2260	0.0000	FLOOD RISK
60 minute winter	4	30	50.172	4.052	1173.7	7.1594	0.0000	FLOOD RISK
60 minute winter	3	30	49.294	3.234	1176.1	5.7151	0.0000	SURCHARGED
60 minute winter	2	30	47.476	1.716	1176.8	3.0314	0.0000	SURCHARGED
60 minute winter	1	30	46.826	1.276	1173.7	2.2544	0.0000	SURCHARGED
60 minute winter	7	27	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
60 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
60 minute winter	4	1.002	3	1176.1	4.176	2.730	4.2891	
60 minute winter	3	1.003	2	1176.8	4.178	2.145	13.2676	
60 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
60 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	3746.0

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
120 minute summer	6	62	50.500	4.100	2606.2	373.2435	1620.4290	FLOOD
120 minute summer	5	62	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
120 minute summer	4	62	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
120 minute summer	3	64	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
120 minute summer	2	64	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
120 minute summer	1	64	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
120 minute summer	7	58	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
120 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
120 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
120 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
120 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
120 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	5128.9

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Results for 100 year +10% CC 120 minute winter. 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 (m³)	Flood (m³)	Status
120 minute winter	6	58	50.500	4.100	2394.2	373.2435	1799.4720	FLOOD
120 minute winter	5	58	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
120 minute winter	4	58	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
120 minute winter	3	58	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
120 minute winter	2	60	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
120 minute winter	1	60	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
120 minute winter	7	52	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
120 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
120 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
120 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
120 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
120 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	5760.0

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Results for 100 year +10% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	6	92	50.500	4.100	2173.8	373.2435	1313.1700	FLOOD
180 minute summer	5	92	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
180 minute summer	4	92	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
180 minute summer	3	96	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
180 minute summer	2	96	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
180 minute summer	1	96	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
180 minute summer	7	88	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
180 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
180 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
180 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
180 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
180 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	6396.2

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Results for 100 year +10% CC 180 minute winter. 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 (m³)	Flood (m³)	Status
180 minute winter	6	88	50.500	4.100	1885.3	373.2435	1225.0680	FLOOD
180 minute winter	5	88	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
180 minute winter	4	88	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
180 minute winter	3	88	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
180 minute winter	2	92	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
180 minute winter	1	92	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
180 minute winter	7	80	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
180 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
180 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
180 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
180 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
180 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	7380.1

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
240 minute summer	6	124	50.500	4.100	1921.2	373.2435	935.8667	FLOOD
240 minute summer	5	124	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
240 minute summer	4	124	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
240 minute summer	3	124	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
240 minute summer	2	124	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
240 minute summer	1	124	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
240 minute summer	7	116	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
240 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
240 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
240 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
240 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
240 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	7418.1

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Results for 100 year +10% CC 240 minute winter. 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 (m³)	Flood (m³)	Status
240 minute winter	6	120	50.500	4.100	1586.5	373.2435	681.3613	FLOOD
240 minute winter	5	120	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
240 minute winter	4	120	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
240 minute winter	3	120	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
240 minute winter	2	120	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
240 minute winter	1	120	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
240 minute winter	7	108	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
240 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
240 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
240 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
240 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
240 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	8695.3

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
360 minute summer	6	184	50.500	4.100	1547.7	373.2435	476.9656	FLOOD
360 minute summer	5	184	50.242	4.082	1175.0	7.2125	0.0000	FLOOD RISK
360 minute summer	4	184	50.163	4.043	1175.4	7.1440	0.0000	FLOOD RISK
360 minute summer	3	184	49.280	3.220	1175.7	5.6900	0.0000	SURCHARGED
360 minute summer	2	192	47.473	1.713	1174.1	3.0261	0.0000	SURCHARGED
360 minute summer	1	192	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
360 minute summer	7	176	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	6	1.000	5	1175.0	2.174	0.800	13.0550	
360 minute summer	5	1.001	4	1175.4	1.632	0.557	2.8432	
360 minute summer	4	1.002	3	1175.7	4.174	2.729	4.2891	
360 minute summer	3	1.003	2	1174.1	4.169	2.140	13.2676	
360 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
360 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	9056.1

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Results for 100 year +10% CC 360 minute winter. 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 (m³)	Flood (m³)	Status
360 minute winter	6	200	50.500	4.100	1216.4	373.2435	9.8154	FLOOD
360 minute winter	5	200	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
360 minute winter	4	200	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
360 minute winter	3	200	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
360 minute winter	2	200	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
360 minute winter	1	200	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
360 minute winter	7	168	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	6	1.000	5	1173.7	2.172	0.799	13.0550	
360 minute winter	5	1.001	4	1173.7	1.630	0.556	2.8432	
360 minute winter	4	1.002	3	1173.7	4.167	2.724	4.2891	
360 minute winter	3	1.003	2	1173.7	4.167	2.139	13.2676	
360 minute winter	2	1.004	1	1173.7	4.167	0.990	2.0050	
360 minute winter	1	1.005	7	1173.7	4.167	1.705	3.6524	10597.1

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
480 minute summer	6	256	50.500	4.100	1293.8	373.2435	61.5836	FLOOD
480 minute summer	5	256	50.236	4.076	1173.7	7.2031	0.0000	FLOOD RISK
480 minute summer	4	256	50.157	4.037	1173.7	7.1342	0.0000	FLOOD RISK
480 minute summer	3	256	49.275	3.215	1173.7	5.6815	0.0000	SURCHARGED
480 minute summer	2	256	47.473	1.713	1173.7	3.0261	0.0000	SURCHARGED
480 minute summer	1	256	46.825	1.275	1173.7	2.2523	0.0000	SURCHARGED
480 minute summer	7	240	45.987	0.568	1173.7	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	6	1.000	5	1173.7	2.172	0.799	13.0550	
480 minute summer	5	1.001	4	1173.7	1.630	0.556	2.8432	
480 minute summer	4	1.002	3	1173.7	4.167	2.724	4.2891	
480 minute summer	3	1.003	2	1173.7	4.167	2.139	13.2676	
480 minute summer	2	1.004	1	1173.7	4.167	0.990	2.0050	
480 minute summer	1	1.005	7	1173.7	4.167	1.705	3.6524	10236.7

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Results for 100 year +10% CC 480 minute winter. 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 (m³)	Flood (m³)	Status
480 minute winter	6	264	49.156	2.756	998.1	250.8643	0.0000	SURCHARGED
480 minute winter	5	264	48.971	2.811	983.2	4.9667	0.0000	SURCHARGED
480 minute winter	4	264	48.915	2.795	983.3	4.9394	0.0000	SURCHARGED
480 minute winter	3	264	48.296	2.236	983.5	3.9511	0.0000	SURCHARGED
480 minute winter	2	264	47.030	1.270	983.6	2.2445	0.0000	SURCHARGED
480 minute winter	1	264	46.575	1.025	983.6	1.8116	0.0000	SURCHARGED
480 minute winter	7	240	45.987	0.568	983.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	6	1.000	5	983.2	1.819	0.670	13.0550	
480 minute winter	5	1.001	4	983.3	1.365	0.466	2.8432	
480 minute winter	4	1.002	3	983.5	3.492	2.283	4.2891	
480 minute winter	3	1.003	2	983.6	3.492	1.793	13.2676	
480 minute winter	2	1.004	1	983.6	3.492	0.830	2.0050	
480 minute winter	1	1.005	7	983.6	3.492	1.429	3.6524	11533.5

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Results for 100 year +10% 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 (m³)	Flood (m³)	Status
600 minute summer	6	330	49.581	3.181	1117.1	289.5961	0.0000	SURCHARGED
600 minute summer	5	330	49.372	3.212	1046.0	5.6758	0.0000	SURCHARGED
600 minute summer	4	330	49.309	3.189	1046.7	5.6355	0.0000	SURCHARGED
600 minute summer	3	330	48.607	2.547	1047.3	4.5009	0.0000	SURCHARGED
600 minute summer	2	330	47.171	1.411	1047.9	2.4938	0.0000	SURCHARGED
600 minute summer	1	330	46.655	1.105	1048.1	1.9522	0.0000	SURCHARGED
600 minute summer	7	315	45.987	0.568	1048.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	6	1.000	5	1046.0	1.936	0.712	13.0550	
600 minute summer	5	1.001	4	1046.7	1.453	0.496	2.8432	
600 minute summer	4	1.002	3	1047.3	3.719	2.431	4.2891	
600 minute summer	3	1.003	2	1047.9	3.720	1.910	13.2676	
600 minute summer	2	1.004	1	1048.1	3.721	0.884	2.0050	
600 minute summer	1	1.005	7	1048.2	3.722	1.523	3.6524	10945.3

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Results for 100 year +10% CC 600 minute winter. 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 (m³)	Flood (m³)	Status
600 minute winter	6	330	48.304	1.904	854.9	173.3148	0.0000	SURCHARGED
600 minute winter	5	330	48.169	2.009	840.8	3.5493	0.0000	SURCHARGED
600 minute winter	4	330	48.128	2.008	840.9	3.5483	0.0000	SURCHARGED
600 minute winter	3	330	47.675	1.615	841.1	2.8541	0.0000	SURCHARGED
600 minute winter	2	330	46.750	0.990	841.2	1.7485	0.0000	SURCHARGED
600 minute winter	1	330	46.417	0.867	841.2	1.5315	0.0000	SURCHARGED
600 minute winter	7	330	45.980	0.561	841.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	6	1.000	5	840.8	1.556	0.573	13.0550	
600 minute winter	5	1.001	4	840.9	1.168	0.398	2.8432	
600 minute winter	4	1.002	3	841.1	2.986	1.952	4.2891	
600 minute winter	3	1.003	2	841.2	2.987	1.533	13.2676	
600 minute winter	2	1.004	1	841.2	2.987	0.710	2.0050	
600 minute winter	1	1.005	7	841.2	2.987	1.222	3.6390	12299.1

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