Land off Mandip Way, Great Ashby

Flood Risk Assessment and Drainage Strategy

November 2025

Revision G

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Contents

1	**Introduction**	**05**
2	**Existing Site and Proposed Development**	**09**
3	**Flood Risk**	**11**
	Risk of Flooding to the Development from Known Sources	14
	Risk of Flooding from the proposed development	17
4	**Proposed Development Drainage Strategy**	**20**
	Surface Water Drainage Strategy	21
	Discharge Strategy	24
	Foul Water Drainage Strategy	31
5	**Summary and Conclusions**	**32**

Appendices

Appendix A Location Plan

Appendix B LLFA Pre-App Comments

Appendix C Topographic Survey

Appendix D Illustrative Masterplan

Appendix E Environment Agency - Flood Maps

Appendix F PJA Surface Water Flow Route Diversion Technical Note

Appendix G Flood Exceedance Route Plan

Appendix H GEA Ground Investigation Report

Appendix I Thames Water Sewer Records

Appendix J Thames Water Sewer Flooding Enquiry

Appendix K Proposed Drainage Strategy, Typical Details and Outfall Photographs

Appendix L Drainage Calculations

Appendix M Surface Water Drainage Statement: Pro-Forma

Appendix N Thames Water Pre-Planning Assessment Report

Report Reference

19244/FRA and DS Rev G

Revision History

Rev	Amendments	Prepared By	Checked By	Date
First Issue	N/A	JD	GBR	16/06/2024
Rev A	Updated to suit latest layout	GBR	GBR	19/07/2024
Rev B	Updated to suit latest layout	YT	GBR	04/04/2025
Rev C	Updated to suit LLFA Comments	GBR	GBR	19/07/2025
Rev D	Updated to suit final masterplan	GBR	GBR	23/10/2025
Rev E	Updated to suit Client's comments	YT	GBR	30/10/2025
Rev F	Updated to suit Client's comments	YT	GBR	03/11/2025
Rev G	Description of Development updated	SP	GBR	02/01/2026

Introduction

Introduction

The following paragraphs state the purpose of this document, a summary of existing and future site details is also provided.

1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Woods Hardwick Ltd (WH) on behalf of Picture Estates Ltd in support of the Hybrid application for a for a residential-led development comprising residential (Use Class C3), educational use (Use Class F1), a community hub (Use Class F2) with associated new internal roads, access, parking, cycling infrastructure, landscaping and other associated infrastructure on land known as 'Land off Mendip Way, Great Ashby' in Stevenage. A Site Location Plan is included in **Appendix A.**

1.2 Full application comprises the construction of vehicle access and an active travel link via Mendip Way, with associated landscaping and drainage works.

1.3 The outline application, for which all matters are reserved except for means of access, comprises the erection of up to 640 dwellings (Use Class C3), a site for a primary school, further land reserved for educational use (Use Class F1), a site for a community hub (Use Class F2), with associated infrastructure."

1.4 The site measures approximately 62.9 hectares (ha) and is identified in the adopted Local Plan as site GA2 under Policy SP18 for development of approximately 600 homes plus supporting infrastructure. The outline planning application will be submitted for the following;

- Up to 640 residential units;
- Up to 500sqm retail, food and beverage, and medical and social floorspace;
- 4ha of land to make provision for 2FE primary/ 4FE secondary school; and
- Suitable parking infrastructure designed in line with local car parking standards.
- Principle access to the Site is to be provided via Mendip Way, with provision for sustainable modes of transport in alignment with the Stevenage Mobility Strategy. The access road to the Site will be designed to effectively integrate into the nearby existing road networks.

1.5 In terms of flood risk, the application site is situated in Flood Zone 1, land which has less than a 1 in 1,000 annual probability of river or sea flooding. Although the site is not shown as being at risk of flooding on the EA mapping, this report has been prepared on the basis that the total site area exceeds 1ha.

1.6 Following Pre-Application discussions with the Lead Local Flood Authority (LLFA) one of the existing surface water flow routes through the site has been modelled and diverted through the site to suit the proposed layout.

1.7 Further formal Pre-Application advice on the revised proposed was provided by the LLFA in their letter dated (21/07/2025). Following receipt of the comments a meeting took place on 27/08/2025 to discuss the comments and required actions. This revision of the FRA and the supporting Drainage Strategy and Calculations have been updated to reflect the LLFA's requirements. A copy of the comments are included within **Appendix B**.

1.8 The updates include further assessment of the proposed flow path diversion and outfall connection (Paragraph 3.17 – 3.18 and Appendix F), assessment of the existing ditch network and connectivity (Paragraph 3.17 and Appendix K), and updated drainage calculations using FEH22 rainfall data with a 40% climate change allowance (Paragraph 4.21 and Appendix L). Safe access and egress arrangements (see paragraph 4.7 and Appendix K), finished floor levels and exceedance routing have been clarified (Paragraph 3.21 – 3.25 and Appendix G), and a detailed maintenance and management strategy for all SuDS features has been included (Paragraph 4.40 – 4.45). An investigation of the historic flooding has also been undertaken and it has been confirmed that there is no known history of the site flooding (Paragraph 3.7).

1.9 This document has been written in accordance with the guidance contained within the Flood Risk and Coastal Change section of the Government's Planning Practice Guidance (FRCC, PPG).

1.10 This FRA concludes that the proposed development will not lead to the impedance of flood flows and will not increase the risk of flooding on the site itself, adjacent properties or to third parties situated either upstream or downstream of the site.

1.11 This document includes a Surface Water Drainage Strategy that identifies a suitable sustainable strategy for the disposal of surface water from the proposed development site that conforms with the guidance contained within the following documents:

- CIRIA C753 SuDS Manual (2015)
- Hertfordshire County Council's LLFA Summary Guidance for Developers (August 2021)
- Hertfordshire's County Council's LLFA Climate Change Allowance Note (November 2017)

1.12 The proposed Drainage Strategy is based on a maximum allowance of 40% climate change in accordance with the LLFA's Climate Change Allowance Note.

1.13 The document also includes a foul water drainage strategy which summarises the correspondence to date with Thames Water and confirms that a suitable strategy to manage foul water flows from the site will be in place upon occupation.

1.14 From the findings of this report, the development proposals are considered appropriate for the site location; therefore, should be fully supported through the Planning process in terms of Flood Risk, Foul and Surface Water Drainage.

Existing Site and Proposed Development

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Existing Site and Proposed Development

The following paragraphs provide detail on the existing and proposed future mixed use development site; in relation to location, land uses and topography.

2.1 The proposed development site is located within Weston Parish, a civil parish in the North Hertfordshire district of Stevenage. The site is located approximately 4.8km to the north east of Stevenage, 9.3km to the southeast of Hitchin and 9.5km to the south of Letchworth Garden City. The site is located within the administrative boundary of North Hertfordshire District Council (NHDC) who represent the Local Planning Authority (LHA).

2.2 The site is irregular in shape and measures approximately 54 ha. The site is currently greenfield, comprising agricultural land and woodland.

2.3 A Topographic Survey of the site was carried out by Terrain Surveys during July 2021. During the survey, information was recorded on the location and type of land features observed, including type of surface finishes, land boundaries, existing building outlines and vegetation. All surveyed elevations were recorded at heights in metres above Ordnance Datum (mAOD). Ground levels and spot levels are also indicated on the drawing where they were recorded onsite. A copy of the Topographical Survey is provided in **Appendix C.**

2.4 In terms of existing drainage utilities, Thames Water sewer records confirm the presence of existing foul and surface water sewers which run along Mendip Way to the west of the site.

2.5 The development proposals are for the following;

- Up to 640 residential units;
- Up to 500sqm retail, food and beverage, and medical and social floorspace;
- 4ha of land to make provision for 2FE primary/ 4FE secondary school; and
- Suitable parking infrastructure designed in line with local car parking standards.
- Principle access to the Site is to be provided via Mendip Way, with provision for sustainable modes of transport in alignment with the Stevenage Mobility Strategy. The access road to the Site will be designed to effectively integrate into the nearby existing road networks.

2.6 A copy of the Illustrative Masterplan is provided in **Appendix D**.

Flood Risk

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Flood Risk

The following paragraphs will identify whether or not there are any flood risks associated with the future development which may affect the proposals or impact on the surrounding environment.

3.1 This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF) which was published in March 2012 (last updated February 2025) and accompanying Planning Practice Guidance (PPG) published in November 2016 (last updated February 2024).

3.2 Table 1 of the Flood Risk and Coastal Change (FRCC), PPG seeks to define Flood Risk Zones. An extract of this table is shown in Figure 3.1 on the following page.

3.3 Annex 3 of the FRCC, PPG defines 'Flood Risk Vulnerability Classification'. Whilst Table 3 of the same document compares the suitability of a development within a particular Flood Zone based on its corresponding Flood Risk Vulnerability Classification.

3.4 The Environment Agency (EA) Flood Map demonstrates that the site lies within Flood Zone 1 and is therefore classified as having less than a 1 in 1,000 annual probability of flooding from rivers or seas. A copy of the EA Flood Map covering the immediate surrounding area for the proposed development is shown in **Appendix E**.

3.5 According to Annex 3, buildings used for dwelling houses and non-residential uses for health services, educational establishments are classified under the 'More Vulnerable' category which is considered to be appropriate for development within Flood Zone 1. Buildings used for retail; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure are also considered to be appropriate for development within Flood Zone 1. Therefore, there is no need to carry out an Exception Test.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Figure 3.1: Flood Zone Definitions – Planning Practice Guidance Extract

Risk of Flooding to the Development from Known Sources

3.6 Notwithstanding the above, presented below is a summary and analysis of the potential for the site to flood from known sources.

3.7 An investigation of the historic flooding has been undertaken, the site has been in the same ownership for a significant time and the landowners have confirmed that there is no known history of the site flooding.

Flooding from Rivers and/ or Watercourses

3.8 The nearest EA watercourse is the River Beane, a tributary of the River Lea, and is located approximately 2.3km to the south east of the site.

3.9 The EA Flood Map enclosed in **Appendix E** shows that the proposed development land is situated in Flood Zone 1, land which has less than a 1 in 1,000 annual probability of river or sea flooding. Therefore, it is considered that the site is not at risk of flooding from this source.

Flooding from the Sea

3.10 The nearest sea to the site is the North Sea, which is located over 120km to the east of the site. Given this distance, the proposed development is not considered to be at risk of flooding from this source.

Flooding from Land

3.11 The potential for overland flows needs to be considered to ensure that neither the development nor adjacent land and/ or property, including that which may be under the responsibility of a third party, is placed at an unacceptable risk of flooding.

3.12 From the EA Surface Water Flood map for the site, which is enclosed in **Appendix E,** it can be seen that the majority of the development is not shown to be within the extent of any surface water flooding. Therefore; the site is considered to be at 'very low' risk of surface water flooding. The Gov.uk website defines very low risk as an area that has less than 0.1% annual probability of occurring.

3.13 There are however surface water flow routes through the site which correlate with the natural valleys on the site.

3.14 The proposed surface water drainage strategy takes in to account these surface water flow routes. The blue and green corridors on the site will predominantly follow the natural flow routes, where this is not possible surface water flows will be diverted towards the proposed features.

3.15 During formal pre-application discussions with the LLFA it was agreed that there are two main surface water flow routes through the site. One from the north and another from the residential area to the west.

3.16 It was agreed that the route from the north emanated on site but that the route from the west emanated from offsite and would therefore have to be diverted to suit the proposals. It was agreed that the diverted route would be modelled to ensure suitability.

3.17 As such PJA were commissioned to undertake a preliminary catchment analysis and high-level flow calculations to enhance understanding of the flow route. This preliminary analysis and the high level calculations have informed an initial estimate of the potential diversion channel and associated cross-sectional requirements which have been agreed in principle by the LLFA and have now been incorporated into the latest site masterplan. As agreed with the LLFA this route is kept separate from the proposed onsite surface water drainage network. A copy of PJA's report is included in **Appendix F**.

3.18 The flow route is proposed to outfall into the existing ditch network to the south of the site. As requested by the LLFA in their Pre-Application response the condition of the outfall has been inspected on site in detail and is in good condition. Notwithstanding this, as noted on the Drainage Strategy drawing a further inspection of the ditch will be undertaken prior to connection and the ditch will be repaired/maintained prior to the connection being made. Copies of the photographs are included within **Appendix K**.

3.19 Overland flow paths will be taken into account at the detailed design stage and flood routing measured will be incorporated to ensure that surface water flows will be routed away from the more vulnerable areas and towards the sustainable drainage system to be implemented on site.

3.20 A Flood Exceedance Route Plan is provided in **Appendix G**. This plan has been updated to provide further detail as requested by the LLFA in their Pre-Application response.

3.21 As noted on the Drainage Strategy drawing at the reserved matters and detailed design stage all floor levels will be designed to a minimum of 150mm above existing ground level or 300mm above the maximum designed water level of any source of flooding. This will ensure safe access and egress to/from the site.

3.22 The Flood Routing Plan included within **Appendix G** shows the surface water flow routes through the site including where these are to be intercepted by the proposed development.

3.23 The blue arrows on the plan show overland exceedance flow routes for flows in excess of the 1 in 100 + 40% climate change storm confirming that these flows will be routed away from properties.

3.24 The orange arrows show an existing surface water flow route based upon EA mapping which is to be diverted into the an onsite swale.

3.25 The red arrows on the plan show safe access and egress routes from the lower, more vulnerable areas of the site. As previously mentioned FFLs will be raised 150mm or 300mm above the highest anticipated flood level.

Flooding from Groundwater

3.26 A Ground Investigation of the site was undertaken by Geotechnical & Environmental Associates Limited (GEA) in February 2023. The relevant extracts of their report can be found in **Appendix H.**

3.27 From the GEA Report it is noted that beneath a nominal thickness of made ground, Superficial Deposits were found over the Lewes Nodular Chalk Formation and Seaford Chalk Formation. The made ground comprised dark brown silty sandy clay with gravel rootlets extending to depths of between 0.10m and 0.50m. The superficial deposits generally comprised of slightly sandy clay with variable fine to coarse chalk and flint gravel. These deposits extended to depths of between 0.80m and 7.00m and the thickness of the stratum was found to be more consistently thick in the west of the site with thickness reducing in the east.

3.28 No groundwater was encountered during drilling and the standpipes were found to be dry during the monitoring visit. Additionally, contamination testing confirmed that the samples tested were free from elevated concentrations of contaminants.

Flooding from Sewers

3.29 Thames Water sewer records, provided in **Appendix I**, show there are no existing foul water sewers within the site boundary. The closest foul and surface water sewers to the site are located along Mendip Way to the west of the site.

3.30 A sewer flooding enquiry was carried out with Thames Water who confirmed that they have no records of flooding in the vicinity of the site in the last 20 years. A copy of the Thames Water sewer flooding enquiry is provided in **Appendix J**.

3.31 Based on the information above, the proposed site is not considered to be at risk of flooding from this source.

Flooding from Reservoirs, Canals and Other Artificial Sources

3.32 The EA Reservoir Flood Map shows that no part of the site or any immediately neighbouring land is shown to be at risk of flooding from reservoirs. A copy of this mapping is enclosed in **Appendix E.**

3.33 It should be noted that an occurrence of flooding from reservoirs is considered by the EA to be extremely rare. There has been no loss of life in the UK from reservoir flooding since 1925.

3.34 Based on the above, the proposed development is not considered to be at risk of flooding from the aforementioned source.

Risk of Flooding from the Proposed Development

3.35 Presented below is a summary and analysis of the potential for the site to exacerbate the risk of flooding to third parties both upstream and downstream.

Encroachment onto Floodplain

3.36 As outlined above, the site does not lie within the floodplain, there is therefore no risk of encroachment upon the floodplain. The proposed development will be designed around the surface water flow routes as far as possible. Where this is not possible the routes will be diverted into the proposed drainage features and/or away from the vulnerable areas of the site.

Impedance of Flood Flows

3.37 As the site lies out of the floodplain there is no risk of the site impeding flood flows. As above, the surface water flow routes will be accommodated within the proposals.

Contribution of Flood Flows by Development Drainage

3.38 As previously mentioned, the application site covers an area of approximately 62.9ha.

3.39 The proposed development comprises a total of up to 640 residential dwellings with associated infrastructure such as; a school, community hall, an access road, and car parking. These elements will all contribute to the development's surface water discharge.

3.40 If considered appropriate at the detailed design stage, flood routing measures will be incorporated to ensure that flood waters in excess of those for which the site has been designed to accommodate, will be routed away from the more vulnerable areas of the site.

3.41 The surface and foul water disposal strategies for the site are described in greater detail in the following 'Chapter 4 – Proposed Development Drainage Strategy'.

Climate Change

3.42 The EA's guidance document 'Flood risk assessment: climate change allowances' (FRA:CC) sets out the requirements for accounting for climate change within flood risk assessments and drainage strategies.

3.43 The FRA:CC provides allowances for peak river flow and peak rainfall intensity as percentage uplifts that vary by management catchment. These allowances must be applied when assessing fluvial flood risk and in the design of site-wide drainage.

3.44 The peak rainfall allowances for the application site have been taken from the EA's published data for the 'Upper Lee Management Catchment' and are as follows;

Epoch	**Central allowance**	**Upper end allowance**
3.3% annual exceedance rainfall event		
2050s	20%	35%
2070s	20%	35%
1% annual exceedance rainfall event		
2050s	20%	40%
2070s	25%	40%

Table 3.3: Upper Lee Management Catchment peak rainfall allowances

3.45 It is advised to use '2050s' for development with a lifetime up 2060 and the 2070s epoch for development with a lifetime between 2061 and 2125.

3.46 Considering the above, the climate change allowance that the proposed development's drainage strategy will be based on, is set at a value of +40% (Upper end allowance, representing the total potential change anticipated for 2061 – 2125).

Proposed Development
Drainage Strategy

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Proposed Development Drainage Strategy

The following paragraphs provide detail on the proposed site generated foul and surface water disposal methods, design criteria, maintenance regimes and potential third-party legal agreements.

4.1 In addition to ensuring that the development is not at risk of flooding from external sources, it is also important to ensure that the scheme itself does not exacerbate flood risk for others. It is therefore essential that the arrangements for storm and foul water disposal are fully assessed to guarantee that the effects are mitigated and that there will be no impact on the existing land drainage regime.

Surface Water Drainage Strategy

4.2 All of the recent guidance on the arrangements for storm water disposal from new developments has encouraged the application of a hierarchy for surface water disposal. This has now been formalised in the Building Regulations Part H. The hierarchy is also the basis of the advice on surface water disposal contained within the SuDS Design Guidance for Hertfordshire (March 2015).

4.3 The first choice for surface water disposal which should be pursued is via infiltration. Only where it has been determined that the ground conditions are not suitable should the second choice of disposal to a ditch and/ or watercourse be considered. If there is no alternative the third and last choice of disposal to the public sewer can be considered.

Method of Surface Water Discharge

Infiltration

4.4 The results of infiltration testing carried out by GRE confirmed that the soakage rates recorded on the site were generally poor and insufficient to support a fully infiltration-based strategy.

4.5 It is however considered that infiltration by way of permeable paving can be utilised in some areas of the site. The proposed strategy makes allowance for this with the details and supporting calculations being included in **Appendix K and L**, respectively. If necessary more localised infiltration testing will be commissioned at the detailed design stage and this requirement can be secured via a suitably worded planning condition.

Ditch/Watercourse

4.6 A copy of the Surface Water Drainage Strategy is included within **Appendix K**. The strategy has been developed following discussions with both the LLFA and Thames Water who have agreed in principle the proposed strategies and points of discharge.

4.7 The Site Access proposals have been designed in detail and the associated drainage has therefore also been designed to the level of detail required in support of a full planning application. The Access Drawings are contained in **Appendix K** and show the drainage design in detail and to scale. Also included in **Appendix K** are the typical road details including dimensioned plans of the proposed swales.

4.8 The LLFA's Surface Water Drainage Statement: Pro-Forma has been completed and a copy is provided in **Appendix M.**

4.9 As the proposals are outline at this stage assumptions have been made regarding the anticipated impermeable area within each parcel. The assumptions, which are considered to be robust at this stage are presented below.

Residential Areas – 45% impermeable
Schools – 40% impermeable

4.10 A series of 3 large attenuation basins will be provided to attenuate the flows for storm events up to an intensity of 1 in 100 years + 40% climatic change. A further allowance has been made for 10% urban creep.

4.11 Attenuation Basin 1 and 2 have volumes of 6,350m^3 and 9,340m^3 respectively and are both proposed within a wider landscaped corridor beneath the existing electricity cables which are to be retained. Both basins are designed with an approximate depth of 1.5m, 1:3 side slopes and 300mm freeboard to provide extra storage during exceedance events.

4.12 Surface water from the northern part of the site, will drain to these features where they will be temporarily stored prior to onward conveyance towards the outfall.

4.13 Conveyance from the development on the northern part of the site to the basins will be by way of a combination of vegetated swales and surface water sewers. Where swales are to be provided, they will be approximately 1m deep with a 1m bed width and 1:3 side slopes. The cross-sectional area will therefore be 7m. The swales are shown indicatively on the Drainage Strategy drawing.

4.14 The surface water will be conveyed to the basins by a combination of landscaped swales and a piped network.

4.15 Attenuation Basin 3 is located at the southernmost point of the site and is designed with a storage volume of 11,360m^3. The basin is designed with an approximate depth of 1.5m and 1 in 3 side slopes. The basin is provided with 300mm freeboard which provides considerable additional storage should it be required during an exceedance event.

4.16 The flows from Attenuation Basins 1 and 2 along with all surface water from the southern area of the site is discharged to Attenuation Basin 3. As can be appreciated from the Drainage Strategy drawing strategic swales are proposed to convey the majority of flows to this basin.

4.17 Flows from the entire site will ultimately be discharged from Attenuation Basin 3 to the existing ditch network at the calculated Qbar runoff rate of 26l/s.

4.18 As requested in the LLFA Pre-Application Response the condition of the outfall has been inspected on site in detail and is in good condition subject to the cutting back of some overgrown vegetation. Notwithstanding this, as noted on the Drainage Strategy drawing a further inspection of the ditch will be undertaken prior to a connection being made and the ditch will be repaired/maintained prior to the connection being made. Copies of the photographs of the outfall location are included within **Appendix K**.

4.19 It is confirmed that there are no existing connections into the site that need to be incorporated in to the strategy. If however any connections are discovered during excavation of the site they will either be incorporated into the strategy or abandoned as appropriate.

4.20 Within each of the surface water catchments additional SuDS treatment trains such as permeable paving, swales and rainwater gardens will be provided. These features will be considered and proposed as part of future reserved matters planning applications. Typical details of the features that are likely to be provided are included within **Appendix K**. The provision will be in full accordance with the requirements of the National Standards for Sustainable Drainage Systems.

Discharge Strategy

Rainfall Data

4.21 The Flood Estimation Handbook (FEH) methodology has been used in order to determine the requirements of the drainage network. As requested by the LLFA in their Pre-Application response the calculations have been rerun to using FEH22 data. The updated calculations demonstrate that the system operates with no flooding during any storm event. The exceedance route is shown on the plan included in **Appendix G**.

Runoff Rate

4.22 The impermeable area comprises surfaces occupied by the proposed houses, non-residential buildings, private drives and the access road. At this stage calculations are based on an approximate impermeable area within the development parcels. The assumptions made are as follows.

Residential Areas – 45% impermeable
Schools – 40% impermeable

Attenuation Volume Requirement

4.23 The application site is largely undeveloped; therefore, the proposed development will generate an increase in impermeable area.

4.24 It is therefore necessary to ensure that sufficient storage is provided within the attenuation features to accommodate the development site during the 1 in 100 (+40% climate change) storm event with additional allowance for urban creep calculated at 10%. A copy of the Drainage Calculations is provided in **Appendix L**.

4.25 The attenuation volume requirement for the site has been estimated based on the following design parameters:

- 100 year storm event + 40% climate change
- CV value of 1
- Total Contributing Area = 16.5ha (includes the Educational Use Land and Habitat Creation Area) + 10% Urban creep allowance
- Maximum allowable discharge rate = 26l/s As shown on Note 2 of the Drainage Strategy Drawing the Greenfield Rate for each parcel can be calculated by multiplying the impermeable area of the parcel by the greenfield (Qbar) rate of 1.58l/s.

4.26 A total volume of approximately 27,000m^3 of surface water storage will be provided within 3 large Attenuation Basins. Please note that the basins will be provided with 300mm freeboard which provides considerable additional storage should it be required during an exceedance event.

Method of Attenuation

4.27 In accordance with current guidelines and best practice, the Developer's best endeavours will be made to ensure that appropriate Sustainable Urban Drainage Systems (SuDS) are used wherever practicable. There are a number of primary methods available, the appropriateness of which has been considered and summarised in Table 4.1.

Table 4.1: SuDS Feasibility Consideration

SuDS System	Feasibility	Comments
Green Roofs	X	Cost is likely to adversely affect the scheme's viability and other more sustainable options are available.
Permeable Paving	✓	Permeable paving is currently proposed for surface water treatment, storage and infiltration where the results of testing allow.
Soakaways	X	The recorded infiltration rates are not considered to be suitable.
Rainwater Harvesting	✓	Feasible and will be utilised where practicable, although not accounted for within the currently proposed drainage Strategy or attenuation calculations.
Swales	✓	Will be incorporated within the proposed Drainage Strategy.
Attenuation Basin	✓	Three large attenuation basins are currently proposed on this scheme for surface water treatment and storage.
Geo-cellular Storage Crates	X	Geo-cellular crates are not currently proposed for surface water storage.

4.28 Based on the above assessment, which takes into account the underlying ground conditions, it is proposed to provide surface water attenuation within permeable paving where possible with the remainder being provided within the proposed swales and attenuation basins. Further consideration will be given to additional surface water storage and treatment methods at the reserved matters stage.

Surface Water Conveyance

4.29 Surface water runoff from the roofs will be routed towards the permeable paving where provided. Surface water from the remainder of the site will be conveyed via a combination of swales and a piped network.

Sustainability and Water Quality

4.30 The hazard and treatment indices for the proposed development have been reviewed with reference to the CIRIA SuDS Manual C753. As the development proposals are for a mixed use development, the land use in terms of pollution hazard indices consists of:

- Residential roofs
- Other roofs
- Individual property driveways/residential car parks
- Low traffic roads
- Non-residential car parking with infrequent change

4.31 The pollution hazard associated with the above land use classifications are as follows:

Table 4.2 Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change i.e <300 traffic movement/day	Low	0.5	0.4	0.4

4.32 The selected SuDS for the strategic drainage strategy comprise attenuation basins, swales and permeable paving. The mitigation index provided by the SuDS Manual for the proposed SuDS are shown in the table below.

Table 4.3 Mitigation Indices

	Mitigation Indices		
Type of SuDS Component	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Currently Proposed Strategic SuDS			
Permeable Paving	0.7	0.6	0.7
Attenuation Basin	0.5	0.5	0.6
Swale	0.5	0.6	0.6

4.33 To deliver adequate treatment, the proposed SuDS components should have a total mitigation index (for each contaminant type) that equals or is greater than the pollution hazard index (for each contaminant type). Where a single SuDS component is insufficient, additional components in a series would be required, where:

Total SuDS mitigation index = mitigation index 1 + 0.5 (mitigation index)

4.34 A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentration.

4.35 It is evident from the above table that the mitigation indices for permeable paving alone are equal or greater than the pollution hazard indices for a non-residential car park and therefore would offer sufficient treatment for surface water runoff from the non-residential car parks.

4.36 Similarly, for the remainder of the site, the mitigation indices for the attenuation basins alone (without any on-parcel SuDS) are equal or greater than the pollution hazard indices for the different land uses across the site and therefore would offer sufficient treatment. However, it is considered best practice to incorporate more treatment trains within the parcels to further improve the water quality.

4.37 The above demonstrates that contaminants from all areas of the site including the proposed highway will be suitably treated prior to discharge to the ground or the existing ditch network.

4.38 At the Reserved Matters stage Flood Risk Compliance Reports will be prepared for each application and will include confirmation that appropriate treatment is provided including appropriate treatment for the roads as requested in the LLFA's Pre-Application Response.

4.39 As the basins are located downstream of the parcels, it should be noted that when used as a secondary or tertiary component, the treatment capabilities are halved.

Surface Water Drainage Maintenance

4.40 The arrangements for further maintenance of the surface water drainage system needs to be fully considered and, in that respect, it is anticipated that the piped onsite drainage network will be maintained by Thames Water.

4.41 The proposed swales and attenuation basins will also be offered to Thames Water for adoption. In the event that Thames Water do not wish to adopt these features then they will also be offered to the LLFA and Community Council for adoption.

4.42 If none of the above parties are willing to adopt the proposed SuDS features they will be maintained by the management company that would be maintaining the open space within which the features will be located.

4.43 The drainage within and associated with the adoptable highway will be undertaken by the Highway Authority.

4.44 The proposed permeable paving within private areas will be maintained by a management company.

4.45 A summary of the likely maintenance requirements for the attenuation basin and permeable paving are provided in the tables below.

Table 4.4: Recommended Maintenance for Attenuation Basin

Attenuation Basin	
Routine Inspections for Maintenance by Management Company	**Frequency / Undertaken by**
Inspect basin for level of silt build up, general litter/debris build up and erosion or damaged areas. To be visually inspected after heavy rainfall events to ensure that they are free of debris and litter.	6 Monthly As required
Scheduled Maintenance Activities	
Clear accumulated sediment and debris	6 Monthly
Renewal & Replacement Works	
Build up of embankments due to erosion with suitable material	As required As required
Remedial Work	
Inspect and repair damage to inlets, outlets, banks and overflows	Work to be undertaken by adopting body

Table 4.5: Recommended Maintenance for Permeable Paving

Permeable Paving	
Monitoring	**Frequency**
Initial inspection Inspect for evidence of poor operation and/or weed growth – if required, take remedial action. Establish appropriate brushing frequencies.	Monthly for three months after installation. Monthly for three months after installation, 48h after large storms in first 6 months. Annually
Regular Maintenance	**Regular Maintenance**
Brush regularly and remove sweepings from all hard surfaces.	Annually, as required
Occasional Maintenance	**Occasional Maintenance**
Brush surface once a year to prevent silt blockage and enhance design life. Particular attention must be taken to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.	Annually, after leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers recommendations.
Remedial Work	**Remedial Work**
Monitor effectiveness of permeable pavement and when water does not infiltrate seek advice for possible need of reinstatement of top layers or specialist cleaning.	As required

4.46 It should be noted that the maintenance schedule described above should be considered indicative only. The frequency and type of maintenance tasks to be carried out should be reviewed as necessary to ensure that the schedule remains relevant to the nature and location of the proposed residential development.

Foul Water Drainage Strategy

4.47 The TW Pre-Planning Assessment Report contained in **Appendix N**, confirms that there is currently capacity within the existing TW sewer network to serve 20 dwellings and not the fully occupied development.

4.48 However, the response advises that it is Thames Water's responsibility to ensure that there is capacity within the network and at the receiving treatment works for development benefiting from planning consent.

4.49 The response confirms that modelling of the network will be undertaken to determine the necessary mitigation works which will then be undertaken by Thames Water. The modelling will be undertaken when Outline Consent is granted. This is the normal procedure in relation to the process of updrgging the network and therefore not a cause for concern.

4.50 This response was relayed to the LLFA who confirmed that this was acceptable given that Thames Water are obligated to provide consented development with a suitable foul drainage solution.

4.51 Based upon the topography of the site, it has been split into two main foul drainage networks. Network 2 will drain via gravity to an onsite adoptable pumping station from which flows will be pumped into the proposed Network 1. Network 1 will then convey the Network 2 flows and the flows from the remainder of the site to the outfall in proximity to Ryders Hill via gravity.

Foul Water Drainage Maintenance

4.52 In anticipation that the proposed residential development will be connected to the TW public foul sewer network; TW will act in their full capacity as the wastewater provider for the local area, to ensure that maintenance of their public sewers will be carried out as required from the point at which the private sewer outfalls connect to the public sewer network.

Summary and Conclusion

Summary and Conclusions

The following paragraphs summarise the findings of this Flood Risk Assessment and Drainage Strategy. Details of foul and surface water outfalls, SuDS features and maintenance requirements are provided.

5.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Woods Hardwick Ltd on behalf of Picture Estates Ltd in support of the Hybrid application for a for a residential-led development comprising residential (Use Class C3), educational use (Use Class F1), a community hub (Use Class F2) with associated new internal roads, access, parking, cycling infrastructure, landscaping and other associated infrastructure on land known as 'Land off Mendip Way, Great Ashby' in Stevenage.

5.2 The application site comprises an area of approximately 62.9 ha and is shown on the EA's Flood map for planning as lying within Flood Zone 1; therefore, having an annual probability of river and/ or sea flooding of less than 1 in 1,000.

5.3 The EA Surface Water Flood Map confirms that there are existing flow routes through the site, these will be accommodated within the development proposals or diverted to suit.

5.4 Following pre-application discussions with the LLFA, PJA were commissioned to undertake a preliminary catchment analysis of one of the main flow routes through the site. This preliminary analysis and high level calculations have informed an initial estimate of the potential diversion channel capacity which has now been incorporated into the site Masterplan. In accordance with LLFA advice the condition of the outfall has been verified and confirmed as being suitable, this will be inspected again prior to connection with any necessary remedial works being undertaken.

5.5 Further formal Pre-Application advice on the revised proposed was provided by the LLFA in their letter dated (21/07/2025). Following receipt of the comments a meeting took place on 27/08/2025 to discuss the comments and required actions. This revision of the FRA and the supporting Drainage Strategy and Calculations have been updated to reflect the LLFA's requirements.

5.6 The EA mapping confirms that the site is not at risk of flooding from reservoirs.

5.7 All potential sources of flooding to the proposed development have been considered and it has been demonstrated that the site will not be at any significant risk of flooding and that access and egress to the site will be maintained during extreme storm events.

5.8 It has been demonstrated that the proposed development will not exacerbate the risk of flooding to third parties either upstream or downstream from the site.

5.9 The Surface Water Drainage Strategy has been developed in accordance with the hierarchy for sustainable surface water disposal.

5.10 The site's underlying ground conditions are generally not suitable to support an infiltration based strategy, however permeable paving will be used in localised areas where the conditions allow.

5.11 The remainder of surface water attenuation will be provided within swales and attenuation basins.

5.12 The proposed features will provide surface water treatment close to the source while also providing sufficient capacity to accommodate a 1 in 100-year storm event with an additional 40% allowance for climatic change and 10% urban creep. Discharge to the existing ditch network will be at the calculated Qbar rate.

5.13 It is proposed to discharge foul flows from the site into the existing Thames Water network. Foul flows from part of the site will drain via gravity to an onsite adoptable pumping station from which it will be pumped to onsite sewers which will convey the flows along with the flows from the remainder of the site to the outfall via gravity.

5.14 While Thames Water have confirmed that there is currently not sufficient capacity in the network to accommodate the fully occupied proposals, they have acknowledged that it is their responsibility to ensure that there is sufficient capacity in the network for consented development and will therefore undertake the necessary modelling and subsequent mitigation works. If necessary, Thames Water will provide a temporary solution however this is considered to be unlikely to be necessary.

5.15 **From the information provided within this report, it is concluded that there is no reason in terms of drainage or flood risk why the residential development proposed at 'Land off Mendip Way, Great Ashby' in Stevenage should not be fully supported through the planning process.**

Appendix A

Location Plan

Woods Hardwick

Architecture | Engineering | Planning | Surveying

0 0.5km

Application Site Boundary: 62.90ha

Detailed Application Boundary: 0.71ha

Other land within the ownership of the Applicant or their parent company

525600m 525700m 525800m 525900m 526000m 526100m

The Bungalows

143m

Path

Mast

Tilekiln Cottages

140m

144m

Tile Kiln Farm

Dell Spring

Path

Path

Path

Path

Path

Tilekiln Wood

Parsonsgreen Wood

New Spring

Longdell Wood

135m

Path

Hallsgreen Lane (Path)

Farm

Track

Path

Path

WARRENSGREEN LANE

Dane End Farm Cottage

Dane End

130m

Nine Acre Spring

Newberry Grove

128m

Brooches Wood

Track

130m

Track

125m

120m

Drain

115m

Path

CP

WHERNSIDE DR IVE

BENBROKE PL

MERRI CK CL

MENDIP WAY

GABLES FAIRFIELD CRESCENT

GRAMPIAN PLACE

THE CHILTERNS

THE BEACONS

BLACKDOWN CL

GREAT ASHBY WAY

CLEVELAND WAY

MOUNTK

RYDERSHILL

QUANTOCK

FAIRFIELD WAY

WHITEHORSE

School

Great

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LONDON
EC1N 8FH

T 020 3640 8508
mail@iceniprojects.com

CLIENT
Picture Estates Ltd

PROJECT
GA2 - North East Stevenage

TITLE
Application Site Plan

DRAWN BY	CHECKED BY	
SG	SG	
SCALE @ A1	DATE	
1:2,500	JULY_2024	
PROJECT NO.	DRAWING NO.	REV.
23_M004	DL07	C

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Appendix B

LLFA Pre-App Comments

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Growth and Environment

Hertfordshire

Lead Local Flood Authority
Growth and Environment
Hertfordshire County Council
Post Point CHN 215
Farnham House,
Six Hills Way, Stevenage
HERTFORDSHIRE, SG1 2ST
www.hertfordshire.gov.uk

Contact: Flood Risk Management Team
Email: FRMConsultations@hertfordshire.gov.uk

By Email: Matt Ford
<m.ford@WoodsHardwick.com>

Date 21 July 2025

Dear Matt

RE: Preapp/2023/NHDC/01 – Great Ashby, Stevenage

Thank you for your consultation, received 28 April 2025, for pre-application advice regarding the proposed construction of up to 640 dwellings, education facilities, a community hall and associated vehicular, pedestrian and green infrastructure.

Since the submission of the documents and our meeting we would like to advise that the National Standards for Sustainable Drainage Systems has been published, and any application will need to accord with the new standards.

We welcome the updated documents that have addressed the following points:

- The Flood Risk Assessment (FRA) covers all flood risk sources (i.e. surface water, groundwater, surcharged sewer and artificial).
- Greenfield runoff rates have been calculated but these should be updated to represent each parcel and take the new National Standards for SuDS into consideration. This is required, to ensure runoff is not increased from each parcel of development should other parcels not be brought forward.
- Discharge hierarchy has been followed, and infiltration tests have been undertaken. Infiltration is not viable across the entire site but will be utilised where appropriate. Further testing within each parcel will be required unless initial tests show that infiltration is not viable. This can be achieved via an appropriately worded condition. The proposed final discharge point for surface water will be the existing ditch network.
- Open features are being incorporated within the drainage strategy, but further detail is required at application stage. Each parcel of the development is expected to have source control features, but these will vary depending on the nature of development. Further details on the proposed open features is required and should be specific to each parcel of the development with evidence that they are viable. For example, if

swales are proposed along the road, then evidence that appropriate space is available should be provided.

- The correct parameters have been included within the calculations:
  - 40% climate change included on the 1% AEP event
  - CV value of 1 used
  - 10% urban creep allowance has been added.
- Simple index approach has been undertaken for water quality. This includes pollution indices and mitigation indices. Further assessment can be undertaken through a condition, but the LLFA would expect to see SuDS being utilised or the roads.
- The masterplan drainage layout highlights each catchment, proposed attenuation basins and the expected overland flow paths. However, the LLFA would expect to see more detail in relation to these expected exceedance routes as they are likely to be confined to the roads. Details on the anticipated mitigation measures is required. For example, additional freeboard should be provided to properties and FFLs should be raised 300mm above the surrounding ground level.

The LLFA would like to offer some guidance in relation to the flood risk and surface water drainage that may concern the proposed site. These requirements will vary depending on the stage of application that is submitted and therefore the advice is split between the details that should be provided at Outline stage and those that will be required at further planning stages.

<u>Outline Stage:</u>

- Further assessment of the proposed flow path diversion is required with specific focus on the proposed connection point into the existing watercourse. It is our understanding that the diverted flow path will be culverted underneath a footpath and outfall into a formal watercourse. Details on this connection and the suitability of the watercourse are required at this stage.
- An assessment of the existing ditch network and the wider watercourse connectivity will be required to ensure the proposed surface water drainage connection is appropriate. Connectivity of any existing informal drainage (upstream housing or land drainage) will need to be identified and maintained.
- Further detail on safe access and egress is required based on the residual risk created by the development (for all areas inside the red line boundary).
- The provided drainage calculations highlight flooding in the 1% AEP and 1% AEP plus climate change event and in some cases the volumes are quite significant. We appreciate that a flood exceedance plan has been provided but further details on how these flood volumes will be safely stored and managed on site is required. As FEH99 has been used in the calculations, the drainage conveyance and storage features are currently underestimated and will need to be reconsidered.
- Calculations will require updating to use up to date rainfall data. FEH13 or FEH22 rainfall should be used for all calculations. An appropriate climate change allowance

should also be included on the parameters on the 3.33% AEP drainage calculation scenarios.
- An investigation and assessment of historic flood risk should be included within the Flood Risk Assessment.

Detailed Design (including any initial phase and spine roads):

- Full network calculations for the 100% AEP, 50% AEP (if the drainage network is to be adopted), 3.33% AEP, 3.33% AEP plus appropriate climate change allowance, 1% AEP event, 1% AEP plus appropriate climate event.
- We would need to see flood risk resilience and resistance measures, as well as finished floor levels (set at the appropriate level, whichever is the most precautionary of 150mm above external ground levels or 300mm above the maximum design water level of any source of flooding (including the drainage scheme)).
- Safe access and egress must be shown to be possible at the 1% AEP plus climate change.
- As mentioned within the FRA, a detailed maintenance and management strategy will be required for the proposed drainage strategy. This should include details of how each open SuDS feature will be accessed to be maintained.
- Given the size of the development, a phased drainage plan will also be required to show how each parcel will be self-contained and be able to function without being reliant on other phases of the development.
- We would need to see a construction management plan for the construction phase on site (i.e. temporary and permanent measures).
- A phased drainage plan is also required to show how each parcel can function without the whole development being built.

Informative:

For further advice on what we expect to be contained within the FRA and/ or a Drainage Strategy to support a planning application, please refer to the Validation List and Proforma on our surface water drainage webpage https://www.hertfordshire.gov.uk/services/recycling-waste-and-environment/water/surface-water-drainage/surface-water-drainage.aspx this link also includes HCC's Flood Risk Management policies on SuDS in Hertfordshire. We do expect the Validation List to be submitted to the Local Planning Authority and LLFA to show you have provided all information and the Proforma to the LLFA to summarise the details of the proposed development.

Erection of flow control structures or any culverting of an ordinary watercourse requires consent from the appropriate authority, which in this instance is Hertfordshire Lead Local Flood Authority and the Local Council (if they have specific land drainage bylaws). It is advised to discuss proposals for any works at an early stage of proposals.

Both FEH13 and FEH22 are currently accepted to support drainage modelling calculations. For the avoidance of doubt the use of FSR and FEH1999 data has been superseded and therefore, use in rainfall simulations are not accepted.

Yours sincerely

Alex

Alex Jones
SuDS and Watercourses Support Officer
Growth and Environment

Annex

The following documents have been reviewed.

- Report: Flood Risk Assessment and Drainage Strategy, prepared by Woods Hardwick, 04 April 2025, Ref: 19244/FRA and DS, Rev B

Appendix C

Topographic Survey

Woods Hardwick

Architecture | Engineering | Planning | Surveying

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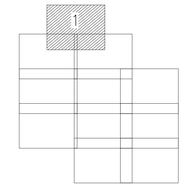
NORTH

Co-ordinate Table			
Station	Easting	Northing	Level
P1	526050.212	227163.706	130.429
P2	526091.401	227093.440	127.297
P3	526160.252	227118.003	125.787
P4	526243.277	227118.641	124.097
P5	526298.355	227144.679	123.391
P6	526372.094	227200.518	121.864
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P10	526371.175	227568.777	125.176
P11	526286.241	227627.473	131.786
P12	526121.144	227843.509	137.902
P13	525924.760	227711.789	138.412
P14	525932.193	227683.226	138.421
P15	525926.104	227641.409	137.383
P16	525934.477	227599.937	135.987
P17	525758.369	227543.030	138.658
P18	525737.509	227358.005	137.711
P19	525844.341	227342.463	137.365
P20	525921.513	227264.020	136.237
P21	526024.400	227244.438	134.178

All levels related to Ordnance Survey active GPS network, at survey station P12.

10 8 6 4 2 0 10 20 metres
SCALE BAR

SHEET LAYOUT



DISCLAIMERS

This survey is related to OSGB36(15) coordinate system by GPS 'rapid static' methods. No scale factor has been applied to the survey information. All horizontal distances taken from this drawing are ground distances.

Every effort has been made to confirm tree species on site, yet it is advised to confirm these details with an arborist before proceeding with any design.

Every effort has been made to confirm drainage run, type and size on site, yet it is advised to check these details against statutory authority records before proceeding with any design.

KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
Borehole	BH	Roof Level	RFL
BT Inspection Cover	BT	Soffit Level	SFL
Cable Television Cover	CTV	Threshold Level	THL
Drainage Channel	DC	Parapet Wall Level	PWL
Electricity Cover	EC	Finished Floor Level	FFL
Electricity Pole	EP	Head Level	HL
Earth Rod	ER	Sill Level	SL
Fire Hydrant	FH	Cover Level	CL
Gas Valve	GV	Invert Level	IL
Gate Post	GP	No Visible Pipes	NVP
Gully	GY	Unable to Lift	UTL
Inspection Cover	IC	Foul Water	FW
Junction Box	JB	Sump Level	SUL
Kerb Outlet	KO	Surface Water	SW
Lamp Post	LP	Brick Paviors	BP
Manhole	MH	Concrete	CON
Marker Post	MK	Concrete Paving Slabs	CPS
Post	P	Flower Bed	F\B
Pipe	PE	Shrub Bed	S\B
Road Sign	RS	Tactile Paving	TAC
Rodding Eye	RE	Unsurfaced	U\S
Marker Post	MK	Brick Wall	BW
Sign Post	SP	Retaining Wall	RW
Stop Valve	SV	Chainlink Fence	CLF
Stop Tap	ST	Chestnut Paling Fence	CPF
Telegraph Pole	TP	Iron Railing Fence	IRF
Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client
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Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-1

Revision	Description	Date

Scale 1:500@A0 Sheet 1 of 11

Drawn by	Checked by	Date of Survey
TP	PG	JULY 2021

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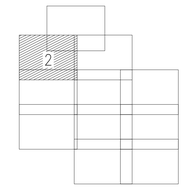
NORTH

10 8 6 4 2 0 10 20 metres
SCALE BAR

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Tree Spread and Girth shown to scale
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Drainage run, direction of flow and pipe size 100
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ABBREVIATIONS

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Project
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Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-2

Revision	Description	Date

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Drawn by	Checked by	Date of Survey
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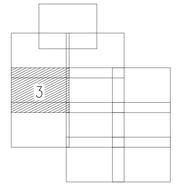
NORTH

10 8 6 4 2 0 10 20 metres
SCALE BAR

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P21	526024.400	227244.438	134.178

All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



DISCLAIMERS

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Every effort has been made to confirm drainage run, type and size on site, yet it is advised to check these details against statutory authority records before proceeding with any design.

KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
Borehole	BH	Roof Level	RFL
BT Inspection Cover	BT	Soffit Level	SFL
Cable Television Cover	CTV	Threshold Level	THL
Drainage Channel	DC	Parapet Wall Level	PWL
Electricity Cover	EC	Finished Floor Level	FFL
Electricity Pole	EP	Head Level	HL
Earth Rod	ER	Sill Level	SL
Fire Hydrant	FH	Cover Level	CL
Gas Valve	GV	Invert Level	IL
Gate Post	GP	No Visible Pipes	NVP
Gully	GY	Unable to Lift	UTL
Inspection Cover	IC	Foul Water	FW
Junction Box	JB	Sump Level	SUL
Kerb Outlet	KO	Surface Water	SW
Lamp Post	LP	Brick Paviors	BP
Manhole	MH	Concrete	CON
Marker Post	MK	Concrete Paving Slabs	CPS
Post	P	Flower Bed	F\B
Pipe	PE	Shrub Bed	S\B
Road Sign	RS	Tactile Paving	TAC
Rodding Eye	RE	Unsurfaced	U\S
Marker Post	MK	Brick Wall	BW
Sign Post	SP	Retaining Wall	RW
Stop Valve	SV	Chainlink Fence	CLF
Stop Tap	ST	Chestnut Paling Fence	CPF
Telegraph Pole	TP	Iron Railing Fence	IRF
Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client
WORMALD BURROWS PARTNERSHIP LTD

Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-3

Revision	Description	Date

Scale 1:500@A0 Sheet 3 of 11

Drawn by	Checked by	Date of Survey
TP	PG	JULY 2021

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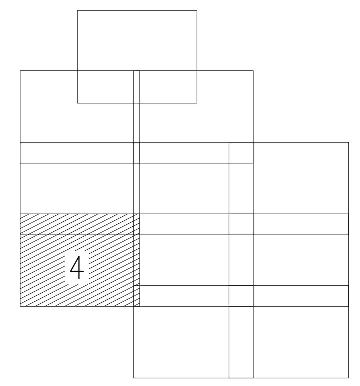
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Co-ordinate Table			
Station	Easting	Northing	Level
P1	526050.212	227163.706	130.429
P2	526091.401	227093.440	127.297
P3	526160.252	227118.003	125.787
P4	526243.277	227118.641	124.097
P5	526298.355	227144.679	123.391
P6	526372.094	227200.518	121.864
P7	526523.720	227294.188	118.610
P8	526574.305	227348.882	116.767
P9	526660.356	227480.220	113.861
P10	526371.175	227568.777	125.176
P11	526286.241	227627.473	131.786
P12	526121.144	227843.509	137.902
P13	525924.760	227711.789	138.412
P14	525932.193	227683.226	138.421
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P18	525737.509	227358.005	137.711
P19	525844.341	227342.463	137.365
P20	525921.513	227264.020	136.237
P21	526024.400	227244.438	134.178

All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5
Banking
Gate (single)
Foliage Line
Gate (double)
Drainage run, direction of flow and pipe size 100
Tree Spread and Girth shown to scale
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
Borehole	BH	Roof Level	RFL
BT Inspection Cover	BT	Soffit Level	SFL
Cable Television Cover	CTV	Threshold Level	THL
Drainage Channel	DC	Parapet Wall Level	PWL
Electricity Cover	EC	Finished Floor Level	FFL
Electricity Pole	EP	Head Level	HL
Earth Rod	ER	Sill Level	SL
Fire Hydrant	FH	Cover Level	CL
Gas Valve	GV	Invert Level	IL
Gate Post	GP	No Visible Pipes	NVP
Gully	GY	Unable to Lift	UTL
Inspection Cover	IC	Foul Water	FW
Junction Box	JB	Sump Level	SUL
Kerb Outlet	KO	Surface Water	SW
Lamp Post	LP	Brick Paviors	BP
Manhole	MH	Concrete	CON
Marker Post	MK	Concrete Paving Slabs	CPS
Post	P	Flower Bed	F\B
Pipe	PE	Shrub Bed	S\B
Road Sign	RS	Tactile Paving	TAC
Rodding Eye	RE	Unsurfaced	U\S
Marker Post	MK	Brick Wall	BW
Sign Post	SP	Retaining Wall	RW
Stop Valve	SV	Chainlink Fence	CLF
Stop Tap	ST	Chestnut Paling Fence	CPF
Telegraph Pole	TP	Iron Railing Fence	IRF
Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client
WORMALD BURROWS PARTNERSHIP LTD

Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-4

Revision	*Description*	*Date*

Scale 1:500@A0 *Sheet* 4 *of* 11

Drawn by	*Checked by*	*Date of Survey*
TP	PG	JULY 2021

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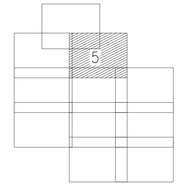
NORTH

10 8 6 4 2 0 10 20 metres
SCALE BAR

Co-ordinate Table			
Station	Easting	Northing	Level
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P2	526091.401	227093.440	127.297
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P6	526372.094	227200.518	121.864
P7	526523.720	227294.188	118.610
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All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Balisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
Borehole	BH	Roof Level	RFL
BT Inspection Cover	BT	Soffit Level	SFL
Cable Television Cover	CTV	Threshold Level	THL
Drainage Channel	DC	Parapet Wall Level	PWL
Electricity Cover	EC	Finished Floor Level	FFL
Electricity Pole	EP	Head Level	HL
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Fire Hydrant	FH	Cover Level	CL
Gas Valve	GV	Invert Level	IL
Gate Post	GP	No Visible Pipes	NVP
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Junction Box	JB	Sump Level	SUL
Kerb Outlet	KO	Surface Water	SW
Lamp Post	LP	Brick Piviors	BP
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Marker Post	MK	Concrete Paving Slabs	CPS
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Pipe	PE	Shrub Bed	S\B
Road Sign	RS	Tactile Paving	TAC
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Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client
WORMALD BURROWS PARTNERSHIP LTD

Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-5

Revision	Description	Date

Scale 1:500@A0 Sheet 5 of 11

Drawn by	Checked by	Date of Survey
TP	PG	JULY 2021

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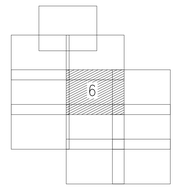
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NORTH

Co-ordinate Table			
Station	Easting	Northing	Level
P1	526050.212	227163.706	130.429
P2	526091.401	227093.440	127.297
P3	526160.252	227118.003	125.787
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All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
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Pipe	PE	Shrub Bed	S\B
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Stop Tap	ST	Chestnut Paling Fence	CPF
Telegraph Pole	TP	Iron Railing Fence	IRF
Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client
WORMALD BURROWS PARTNERSHIP LTD

Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-6

Revision	Description	Date

Scale 1:500@A0 — Sheet 6 of 11

Drawn by	Checked by	Date of Survey
TP	PG	JULY 2021

SCALE BAR 10 8 6 4 2 0 10 20 metres

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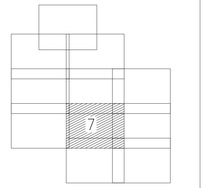
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Co-ordinate Table			
Station	Easting	Northing	Level
P1	526050.212	227163.706	130.429
P2	526091.401	227093.440	127.297
P3	526160.252	227118.003	125.787
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All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
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Stop Tap	ST	Chestnut Paling Fence	CPF
Telegraph Pole	TP	Iron Railing Fence	IRF
Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	POF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

Client

WORMALD BURROWS PARTNERSHIP LTD

Project

GREAT ASHBY, STEVENAGE, HERTS

Title

TOPOGRAPHICAL SURVEY

Drawing Number

TS21-341-7

Revision	Description	Date

Scale	Sheet
1:500@A0	7 of 11

Drawn by	Checked by	Date of Survey
TP	PG	JULY 2021

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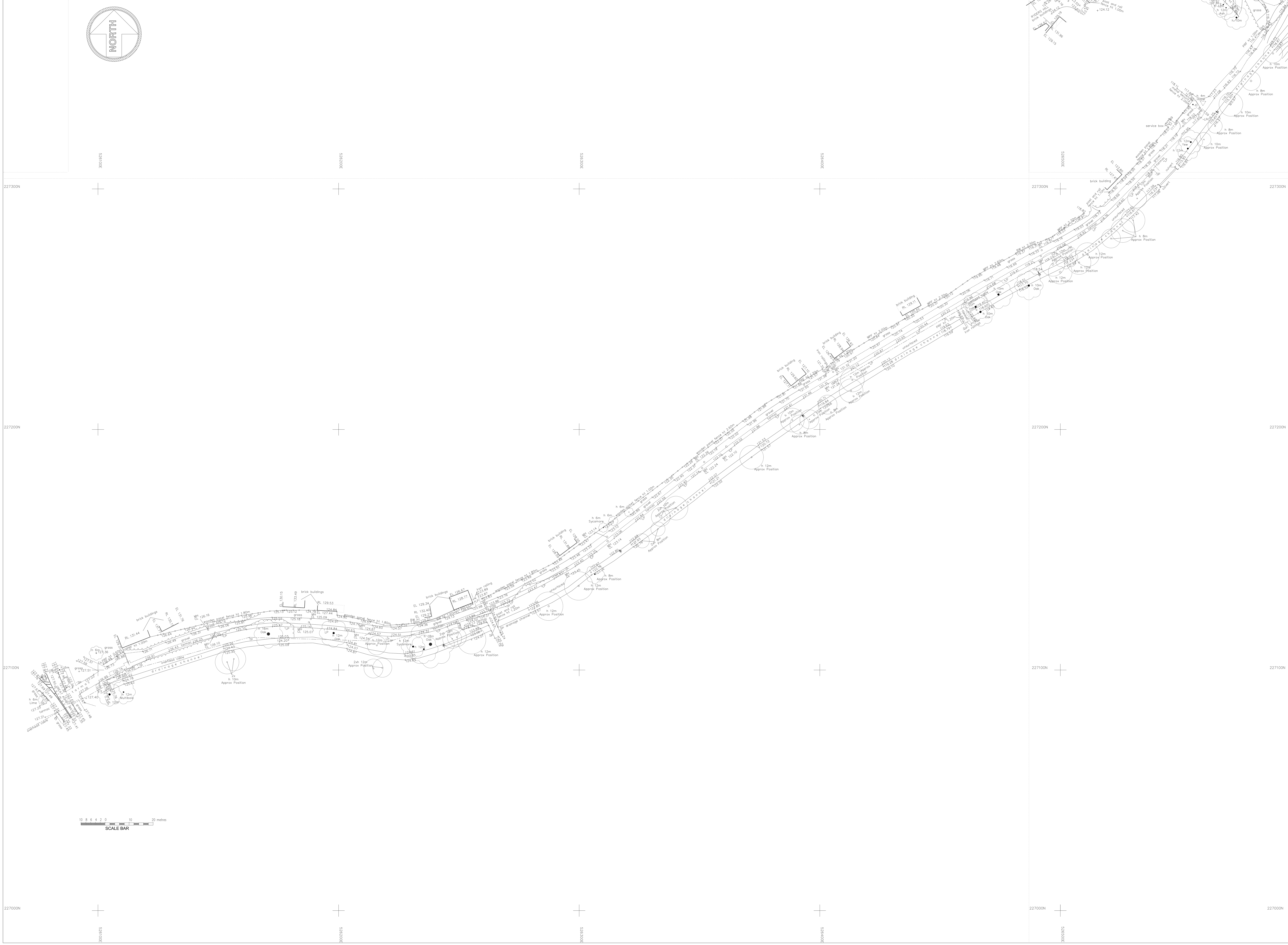
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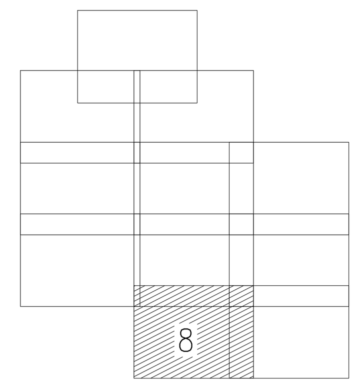
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All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5 — Banking
Gate (single) — Foliage Line
Gate (double) — Drainage run, direction of flow and pipe size (100)
Tree Spread and Girth shown to scale — Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
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Wooden Panel Fence	WPF		

Client
WORMALD BURROWS PARTNERSHIP LTD

Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-8

Revision	Description	Date

Scale	1:500@A0	Sheet	8 of 11

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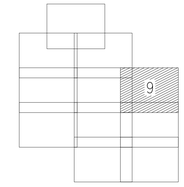
NORTH

10 8 6 4 2 0 10 20 metres
SCALE BAR

Co-ordinate Table			
Station	Easting	Northing	Level
P1	526050.212	227163.706	130.429
P2	526091.401	227093.440	127.297
P3	526160.252	227118.003	125.787
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P5	526298.355	227144.679	123.391
P6	526372.094	227200.518	121.864
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P21	526024.400	227244.438	134.178

All levels related to Ordnance Survey active GPS network, at survey station P12.

SHEET LAYOUT



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KEY

Survey control station △ 5
Gate (single)
Gate (double)
Tree Spread and Girth shown to scale
Banking
Foliage Line
Drainage run, direction of flow and pipe size 100
Approximate Position

ABBREVIATIONS

Air Handling Unit	AHU	Water Meter	WM
Belisha Beacon	BB	Eaves Level	EL
Bollard	BD	Ridge Level	RL
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BT Inspection Cover	BT	Soffit Level	SFL
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Marker Post	MK	Concrete Paving Slabs	CPS
Post	P	Flower Bed	F\B
Pipe	PE	Shrub Bed	S\B
Road Sign	RS	Tactile Paving	TAC
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Marker Post	MK	Brick Wall	BW
Sign Post	SP	Retaining Wall	RW
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Stop Tap	ST	Chestnut Paling Fence	CPF
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Traffic Light	TL	Metal Security Fence	MSF
Vent Pipe	VP	Post and Chain Fence	PCF
Post and Rail Fence	PRF	Post and Wire Fence	PWF
Wooden Panel Fence	WPF		

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Project
GREAT ASHBY, STEVENAGE, HERTS

Title
TOPOGRAPHICAL SURVEY

Drawing Number
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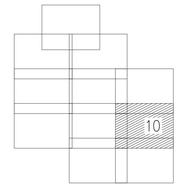
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10 8 6 4 2 0 10 20 metres
SCALE BAR

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All levels related to Ordnance Survey active GPS network, at survey station P12.

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Gate (double)
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Wooden Panel Fence	WPF		

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Title
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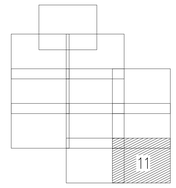
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Title
TOPOGRAPHICAL SURVEY

Drawing Number
TS21-341-11

Revision	Description	Date

Scale 1:500@A0 Sheet 11 of 11

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Appendix D

Illustrative Masterplan

Woods Hardwick

Architecture | Engineering | Planning | Surveying



- Application Boundary
- Housing development
- Open Space
- Potential Allotments
- Streets, with cycleways and footways
- Shared surfaces/key squares
- Public footpath
- Bridleway
- Potential emergency access
- Pedestrian links
- Pedestrian and cycle links
- Unmade woodland pedestrian routes
- Existing bus route and stop
- Existing woodland, hedgerows and trees retained
- Ancient Woodland
- Existing vegetation to be removed
- Proposed trees
- Proposed native woodland planting
- Proposed native thicket planting
- Proposed hedgerow
- Proposed ornamental planting
- Proposed meadow/long grassland
- Existing drainage basin
- Existing watercourse, ditches and ponds
- Proposed swales and drainage basins
- Wildlife pond
- Proposed pumping station
- Proposed timber post and rail fence
- Children's play area
- Pylons and overhead powerlines
- Existing play areas
- Historic quarry
- Grade II Listed Buildings

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Picture Estates Ltd

PROJECT
GA2 - North East Stevenage

TITLE
Illustrative Masterplan

DRAWN BY	CHECKED BY	
SG	SG	
SCALE @ A1	DATE	
1:2,500	FEBRUARY_2024	
PROJECT NO.	DRAWING NO.	REV.
23-M004	DL03	M

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Only figured dimensions are to be worked to.

Appendix E

Environment Agency – Flood Maps

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Get a boundary report

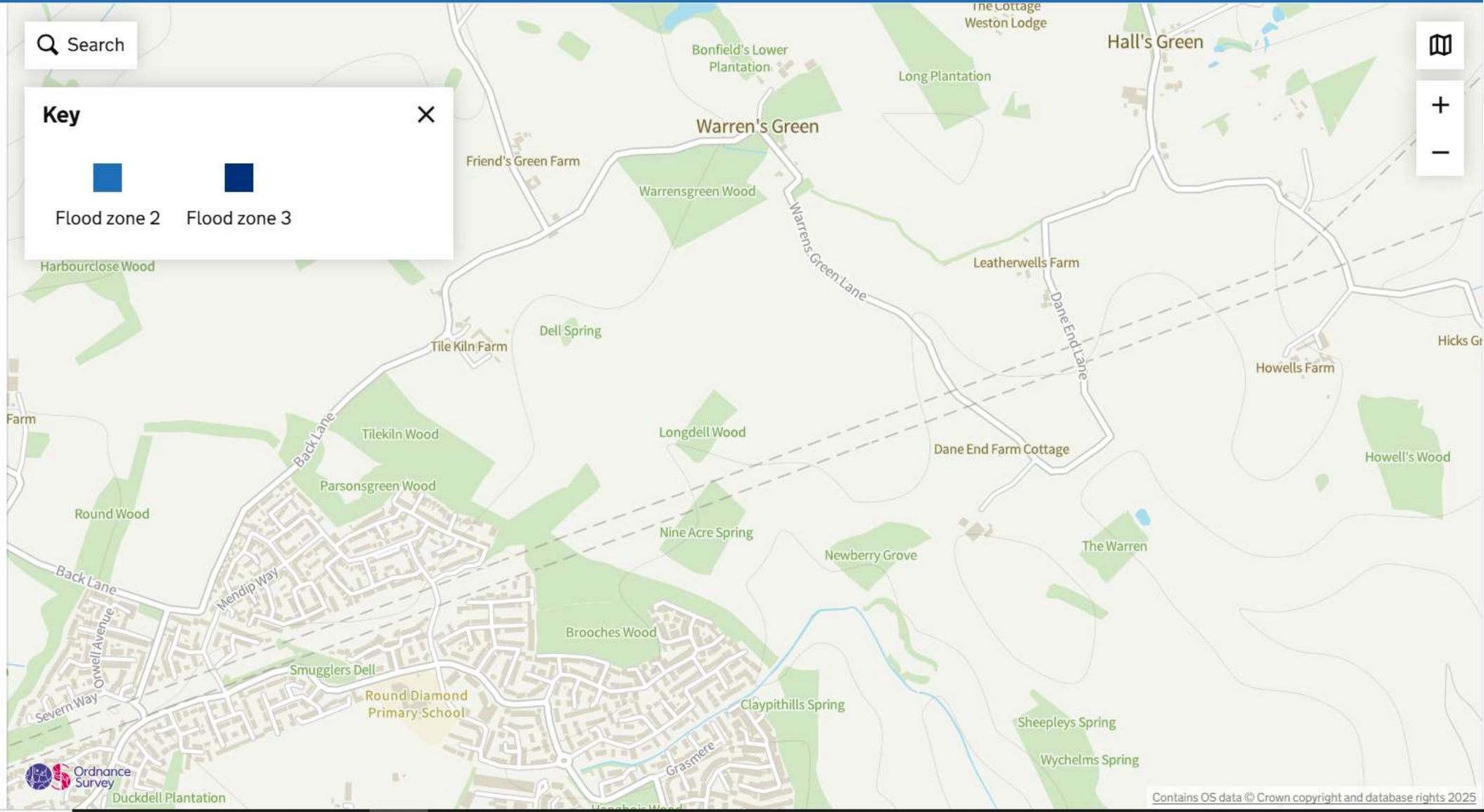
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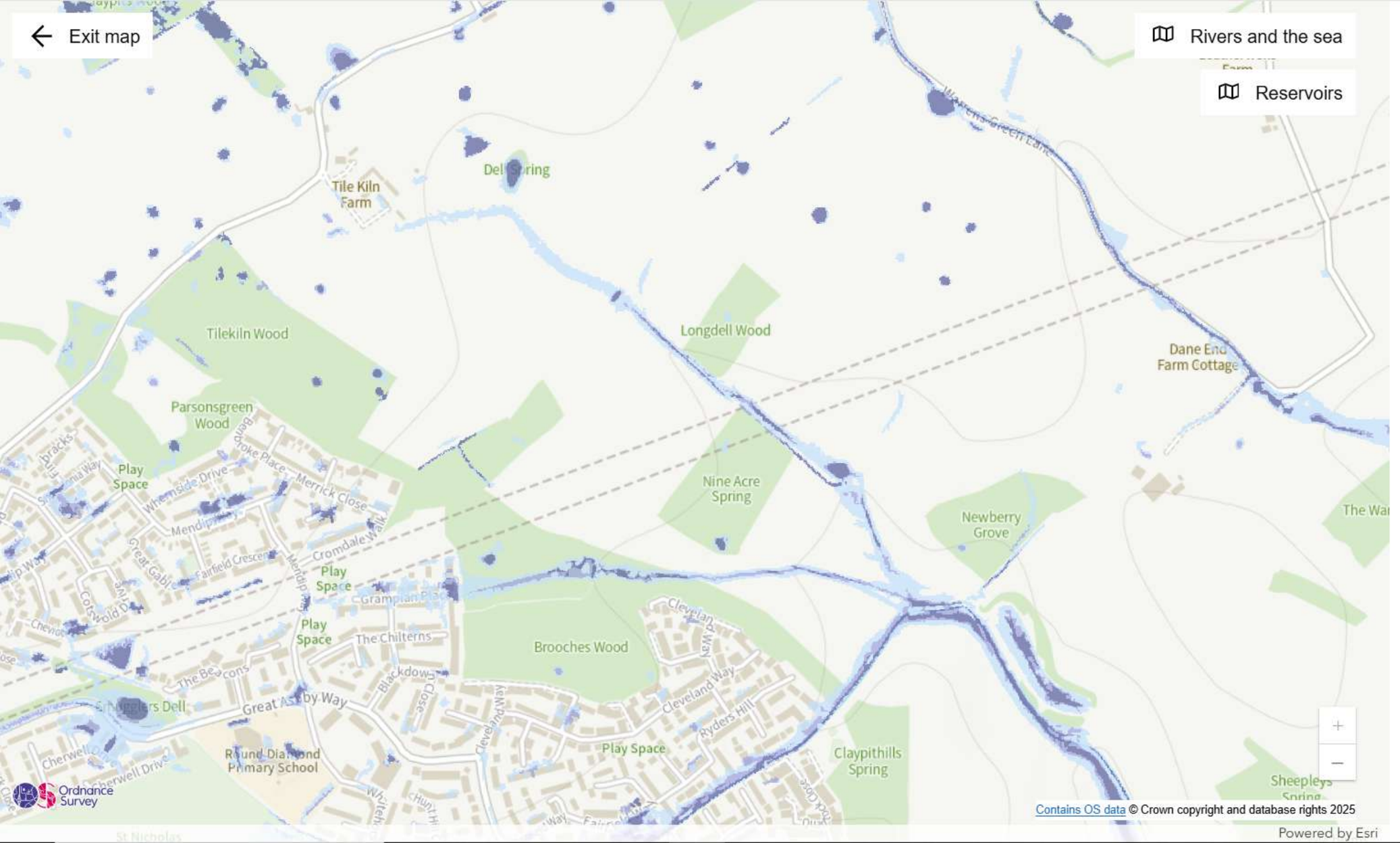
Datasets

- (•) Flood zones 2 and 3
- ( ) River and sea with defences
- ( ) River and sea without defences
- ( ) Surface water
- ( ) None

Map features

- [ ] Water storage
- [ ] Flood defence
- [ ] Main Rivers





Surface water map

Yearly chance of flooding

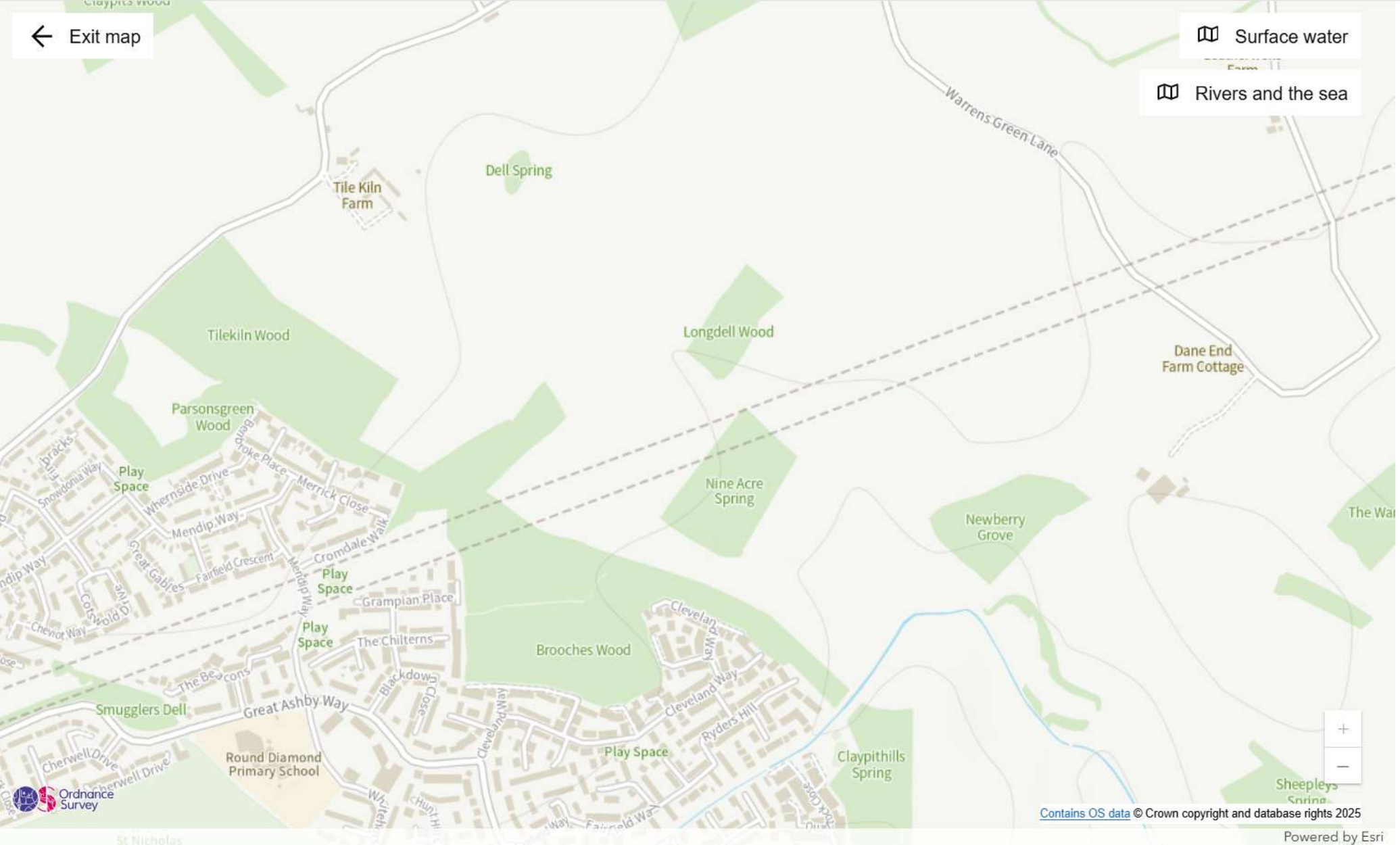
- ○ Extent
- ○ Depth

Yearly chance of flooding between 2040 and 2060

- ◉ Extent
  - High chance: More than 3.3% chance each year
  - Medium chance: Between 1% and 3.3% chance each year
  - Low chance: Between 0.1% and 1% chance each year
- ○ Depth

Map details

- ☑ Show flooding



Reservoirs map

- Extent
  - When river levels are normal
  - When there is also flooding from rivers

Map details

- [x] Show flooding

Appendix F

PJA Surface Water Flow Route Diversion Technical Note

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Technical Note

Project: **Great Ashby, Stevenage**

Subject: **Surface Water Flow Route Diversion**

Client:	Picture Estates Ltd	**Version:**	P0
Project No:	08006	**Author:**	AB
Date:	5 April 2024	**Approved:**	AC

1 Introduction

1.1 Terms of Reference

1.1.1 PJA was commissioned by Picture Estates Ltd to undertake a preliminary catchment analysis and high-level flow calculations to enhance understanding of an existing identified surface water flow route, as shown on the publicly available Long Term Flood Risk Information, Flood Risk from Surface Water map. This preliminary analysis and high-level calculations have informed an initial estimate of the potential diversion channel capacity and associated cross-sectional requirements.

1.1.2 This Technical Note summarises the works undertaken to date.

1.2 Context

1.2.1 An existing surface water flow route has been identified following east to west upstream of, and through, the Site within the publicly available Long Term Flood Risk Information, Risk of Flooding from Surface Water Flood Map, and is shown in Figure 1 .

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WEBSITE pja.co.uk

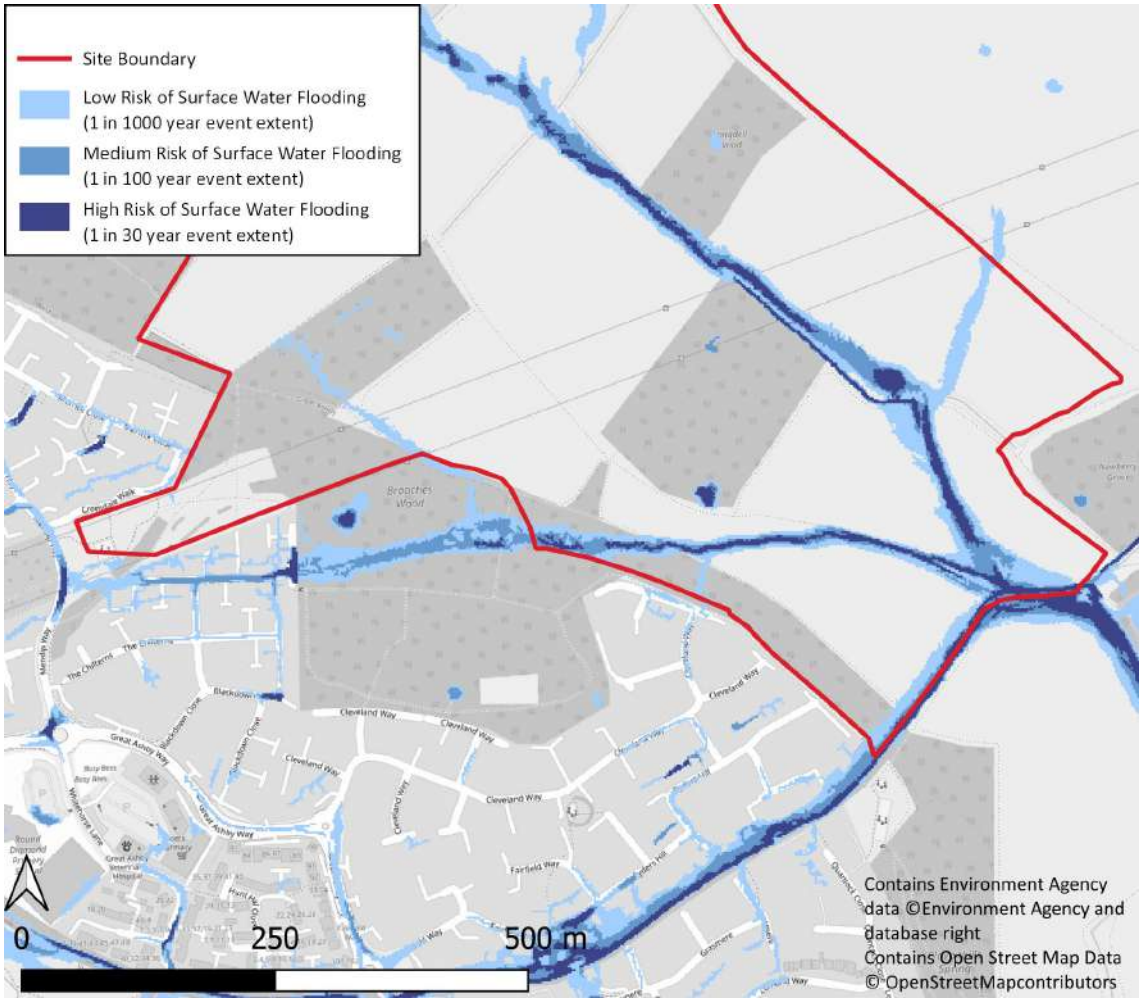


Figure 1: Existing Surface Water Flow Route

1.2.2 It is understood that the existing surface water flow route conveys surface water from agricultural land, existing residential development, and woodland, upstream of the Site. The surface water flow route is understood to currently discharge to an unnamed ordinary watercourse to the southeast of the Site, which is understood to be a tributary of the River Beane. Nonetheless, it is not clear from publicly available mapping how this unnamed, ordinary watercourse connects to the River Beane.

1.2.3 It is understood that the proposed surface water flow route is proposed to be diverted along the western boundary of the Site to facilitate the proposed residential development. It should be noted that the proposed diversion maintains the downstream connectivity with the unnamed, ordinary watercourse.

1.2.4 The proposed diversion is shown in Figure 2 .

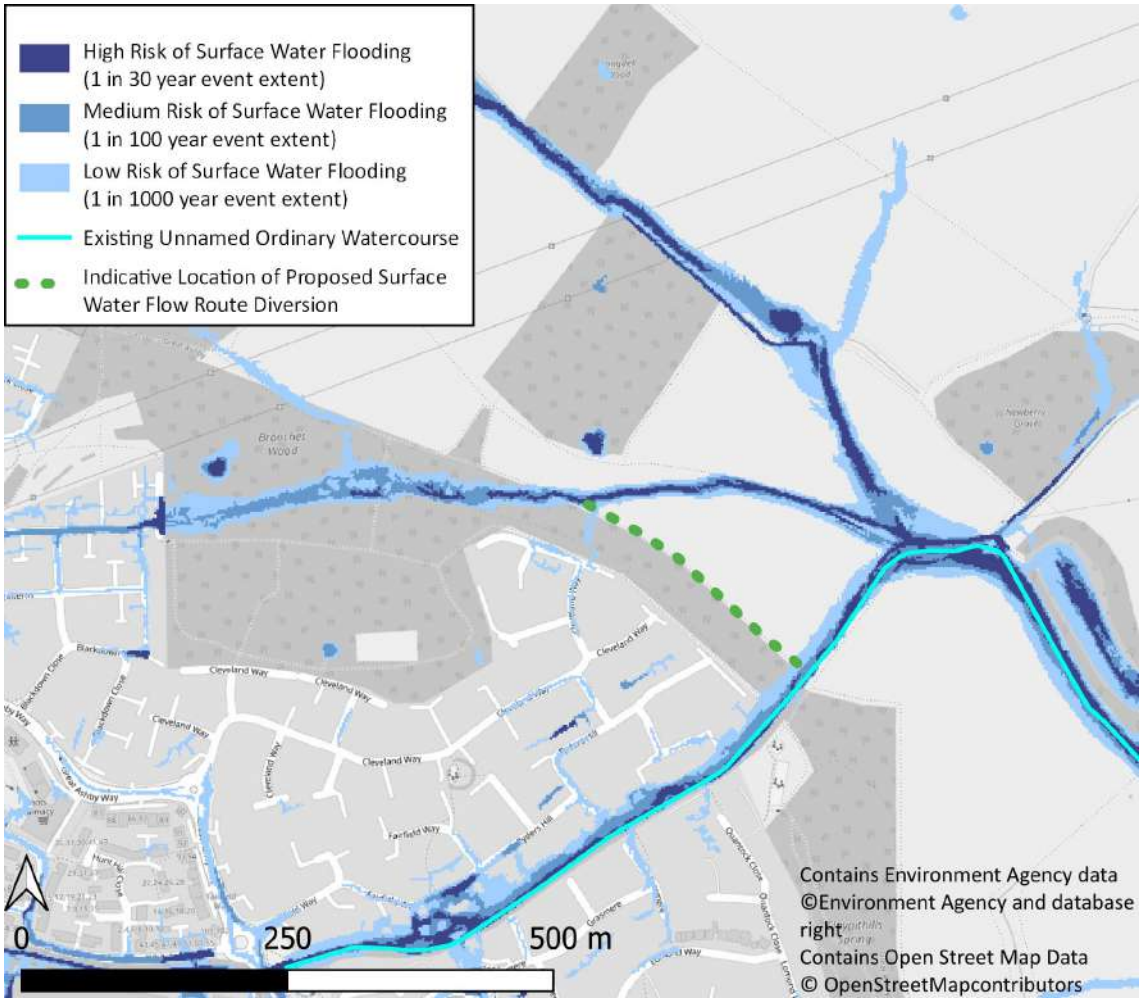


Figure 2: Indicative Location of Proposed Surface Water Flow Route Diversion

2 Catchment Analysis

2.1.1 The catchment of the existing surface water flow route was calculated using LiDAR Digital Terrain Model (DTM) data obtained from the Defra Data Services Platform. The LiDAR DTM data was used to map the contributing catchment draining to the existing ditch. Figure 3 shows the extents of the contributing catchment, which was calculated to be approximately 40.39 ha. The existing catchment contains currently developed land (i.e. existing residential development), which was calculated to be approximately 14.06 ha. The remainder of the catchment area is undeveloped, greenfield land, which was calculated to be approximately 33.33 ha.

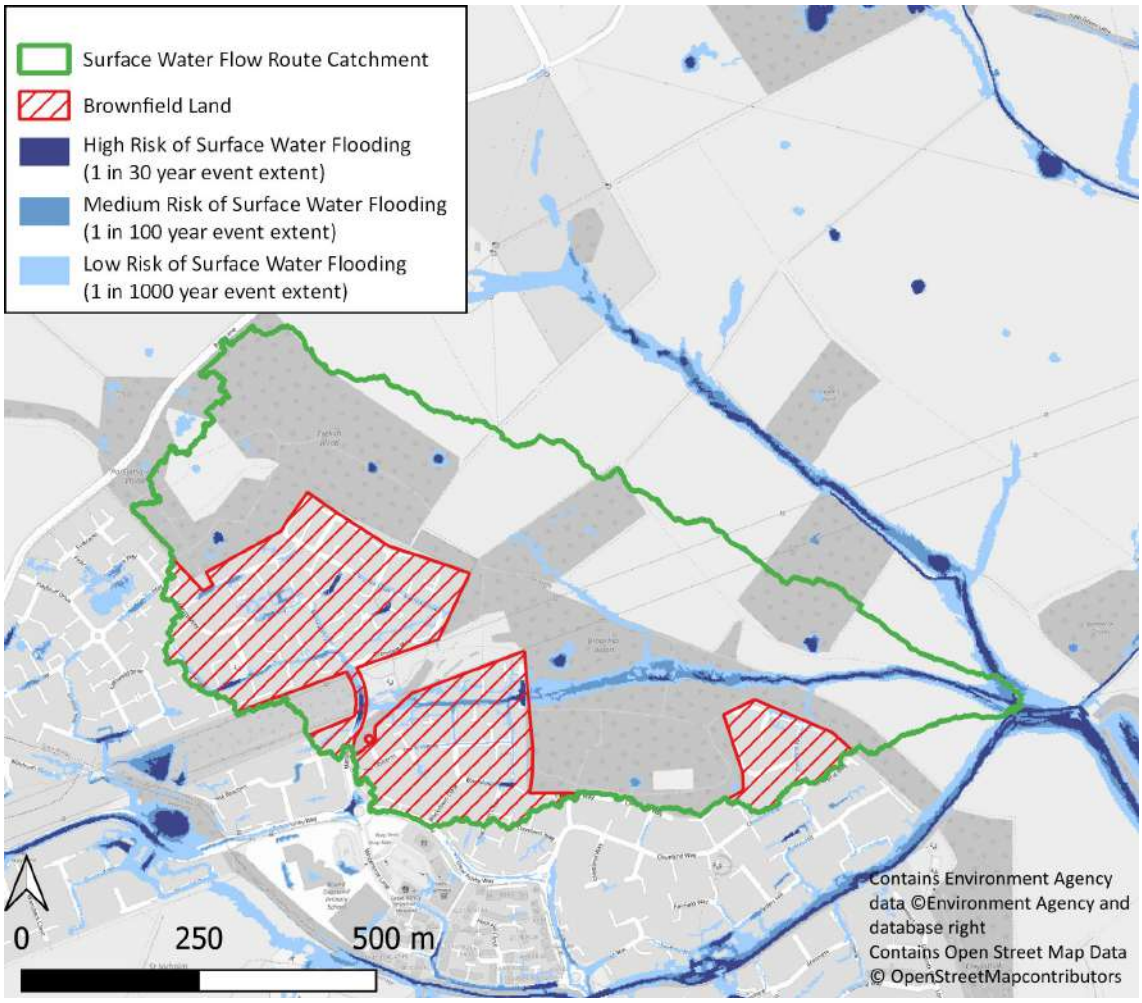


Figure 3: Existing Surface Water Flow Route Catchment

3 High Level Flow Calculations

3.1.1 The rate of greenfield run-off conveyed by the existing surface water flow route for a range of return periods was determined using the HR Wallingford Greenfield runoff rate estimation tool. Flood Estimation Handbook (FEH) catchment descriptors for the site were obtained through the FEH web service. A 40% uplift has been applied to the 1 in 100-year rate to account for climate change.

3.1.2 The run-off rates were determined for the following return periods:

- 1-year;
- 30-year;
- 100-years;
- 100-year-year + 40% climate change allowance (design event).

3.1.3 An indicative run-off rate has been calculated in Causeway Flow software to determine a likely potential discharge rate for the existing residential development within the catchment. The existing residential development of 14.06 ha has been assumed to be 60% impermeable.

3.1.4 A 40% climate change allowance has been applied in accordance with national peak rainfall allowances for the Upper Lee Management Catchment (which the Site falls within) for the 1% annual exceedance rainfall event and the 2070s epoch upper end allowance. A 40% uplift has been applied to the rainfall data within the Causeway Flow model for the existing residential development and for consistency a 40% uplift has been applied to the greenfield 1 in 100-year flow rate.

3.1.5 The peak flow rates from the above assessment are summarised in Table 1.

Table 1: Peak Run-Off Rates

Catchment	1 in 1-year (l/s)	1 in 30-year (l/s)	1 in 100-year (l/s)	1 in 100-year plus 40% Climate Change (l/s)
Greenfield	47.18	130.05	188.97	264.56
Existing Residential	n/a	3,581.70	4,481.60	6,323.70
Total	**n/a**	**3,711.75**	**4,670.57**	**6,588.26**

4 Diversion Channel

4.1.1 The trapezoidal cross-sectional area of the proposed ditch diversion has been calculated using Manning's equation, based on the flow rate for the 1 in 100-year storm even plus 40% climate change for the entire catchment. The Manning's equation is stated below:

$$q = A\,v = A\,(k_n / n)\,R_h^{2/3}\,S^{1/2} \quad (3)$$

where:

q = volume flow (ft^3/s, m^3/s)

A = cross-sectional area of flow (ft^2, m^2)

v = cross-sectional mean velocity (ft/s, m/s)

k_n = 1.0 for SI units

n = Manning coefficient of roughness- ranging from 0.01 (a clean and smooth channel) to 0.06 (a channel with stones and debris, 1/3 of vegetation)

R_h = hydraulic radius (ft, m)

S = slope - or gradient - of pipe (ft/ft, m/m)

4.1.2 The Manning's roughness coefficient has been assumed to be 0.04, which sits within the logical range of main channel that is clean, winding, some pools and shallows, or a main channel with stones and weeds (Chow, 1949[1]).

4.1.3 The slope of the proposed channel has been calculated to be 1 in 42, based on the existing topography. The proposed channel is approximately 240 m in length.

4.1.4 Assuming a channel base width of 1.0 m, with 1 in 3 sides slopes and a maximum peak flow rate of 6.5959 m^3/s, maximum peak water levels are estimated to be 0.82 m. This is demonstrated below:

[1] https://www.fsl.orst.edu/geowater/FX3/help/8_Hydraulic_Reference/Mannings_n_Tables.htm

$$Q = \frac{A^{5/3} S^{1/2}}{nP^{2/3}}$$

$$6.58826 = ((1 + 3\,y)\,y)^{5/3} \times \frac{\sqrt{0.02381}}{0.04\left(1 + 2\,y\left(1 + 3^2\right)^{0.5}\right)^{2/3}}$$

$$y = 0.824331$$

4.1.5 Based on these calculations, an indicative channel cross section capacity of 4.92 m^2 has been determined to convey the maximum peak water level and associated maximum peak flow rate, including a 300 mm freeboard, for the 1 in 100-year plus climate change event.

4.1.6 An indicative cross section for the proposed channel is included in Appendix A.

Limitations

Purpose

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CDM

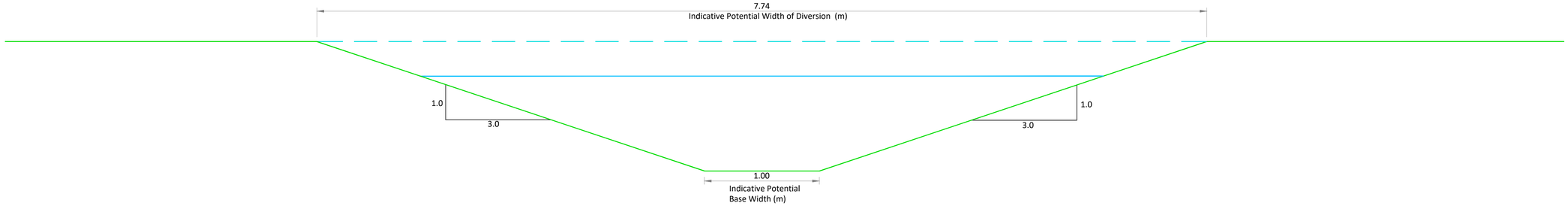
The revised Construction (Design and Management) Regulations 2015 (CDM Regulations) came into force on April 2015 to update certain duties on all parties involved in a construction project, including those promoting the development. One of the designer's responsibilities under clause 9 (1) is to ensure that the client organisation, in this instance Bloor Homes, is made aware of their duties under the CDM Regulations.

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Appendix A Proposed Cross Section

A1 1:20 0.2 0.4 0.6 0.8 1.0 1.2 1.4



CDM Note

These drawings have been produced with reference to the CDM Regulations 2015.
Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9.

GENERAL NOTES:

1. This drawing is to be read in conjunction with all other relevant Engineering and Architect's details.
2. The design details presented must be reviewed in conjunction with the wider site information and site constraints which may not be evident on drawing and must be requested if not already provided. This includes, but not limited to, ground conditions (geotechnical and geo-environmental), groundwater levels, buried services, remnant obstructions, ecology, tree protection and topography.
3. The Engineer shall be notified immediately, in writing, should any errors or discrepancies be found prior to the commencement or continuation of any works.
4. All work is to be carried out in accordance with current British Standards, Building Regulations and NHBC Standards.
5. It is the responsibility of the Contractor to execute the works at all times in strict accordance with the requirements of the Health and Safety at Work Act 1974, and the C.D.M. Regulations 2015. The Contractor will be deemed to have allowed for full compliance, including full liaison with the CDM Co-ordinator, within his rates.
6. Any existing details which are shown on this drawing are for guidance only and are to be checked on site by the contractor. Any variations are to be recorded and reported to the engineer immediately.
7. Before work commences contractor should consult the engineer and the SI report regarding any contamination issues. All necessary Health and Safety measures to be taken
8. Plan to be read in conjunction with 08006-TN-001-P0.
9. Works undertaken are indicative and high level in nature. These are subject to refinement during the next design stage.
10. No hydraulic modeling has been undertaken to inform these works
11. No earthworks or level assessment has been undertaken to inform these works.

Key:

Indicative Maximum Peak Water Level

Indicative Freeboard Level

Rev	Date	Revision Note	Drw	Chk	App
P0	05.04.24	DRAFT	AB	SM	AC

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Client
Picture Estates Ltd

Project
Great Ashby, Stevenage

Title
Indicative Potential Surface Water Flow Route Diversion Channel Cross-Section

Drawing Issue Status

PJA Ref
08006

Scale @ A1
20

Date
05.04.24

Drawing No.
08006-WR-0500

Revision
P0

Primary Contact
contact@pja.co.uk

File name C:\USERS\AMY BENNETT\PHIL JONES ASSOCIATES\SHARED\DATA - 08006 GREAT ASHBY SURFACE WATER\2 - DESIGN\DRAWINGS\CURRENT\08006-WR-0500-P0 PROPOSED CHANNEL CROSS-SECTION.DWG, printed on 05/04/2024 08:39:52, by Amy Bennett

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Appendix G

Flood Exceedance Route Plan

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Tilekiln Wood

Longdell Wood

Nine Acre Spring

Newberry Grove

Brooches Wood

Note:

Safe Access and Egress

All development parcels will be designed with floor levels at a minimum of 150mm above existing ground or 300mm above the maximum designed water level of any source of flooding.

There are no instances of flooding within the proposed development surface water network for all storm events up to and including 100 year + 40% climate change.

Due to the topography of the existing site, and proposed development and surrounding land, there are no expected instances of surface water flooding, should the southern watercourse breach, routes of safe access and egress for the localised development parcels are highlighted on the plan.

0 10 20 30 50 100 150 200
SCALE 1:1250

NOTES

1. Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding. © This drawing is copyright.
2. Reproduced from OS Sitemap ® by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 2008. All rights reserved. Licence number 100007126.
3. Until technical approval has been obtained from the relevant authorities, all drawings are issued as preliminary and not for construction. Should the Contractor commence site work prior to approval being given it is entirely at their own risk.
4. Woods Hardwick cannot accept liability for any discrepancies in terms of coordinates or any other information deciphered from dwg's.
5. The exact location and level of all existing sewers, drains and services to be confirmed on site prior to the commencement of any works.
6. Drainage to be designed in accordance with the Sewerage Sector Guidance, Design and Construction Guidance ("the Code") Approved 2.2, 29 June 2022.

SAFETY, HEALTH AND ENVIRONMENTAL

In addition to the hazards, risks normally associated with the type of work detailed on this drawing, note the following significant risks and information.

Construction:

1. Quantity, location & level of buried utilities and/or structures unknown. Detailed utility survey required and confirmation from individual statutory utility providers that the proposed works do not affect their apparatus.
2. Overhead electric cables running through site, nessecesary health and safety measures required before construction.

For information relating to end use, maintenance, demolition, see the health and safety file.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

KEY

- Site boundary
- Proposed Surface Water Sewer
- Proposed Surface Water Flow Route
- Existing Surface Water Flow Route
- Existing Surface Water Flow Route Proposed Diversion
- Safe Access and Egress Flow Route for Southern Parcels
- Development Parcels
- Retained Woodland
- Proposed Swale

REV	DESCRIPTION	DRN	CHD	DATE
	■ PRELIMINARY ☐ INFORMATION ☐ TENDER ☐ CONSTRUCTION ☐ AS BUILT			

SCALE	1:1250 @ A0	DATE	APRIL 2025
DRAWN	EML	CHK	MDF
DRAWING NO.	19244-ASHB-5-210	REV	-
TITLE	LAND NORTH EAST OF GREAT ASHBY STEVENAGE		
DETAILS	FLOOD ROUTING PLAN		

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Architecture | Engineering | Planning | Surveying

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS DRAWING

Appendix H

GEA Ground Investigation Report

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Great Ashby
Stevenage
Hertfordshire
SG4 7EA

Desk Study &
Ground Investigation
Report

Picture Estates Ltd

March 2023

J22372
Rev 1

Report prepared by



Alex Taylor BSc MSc FGS
Senior Geotechnical Engineer

Report checked and approved by



Steve Branch BSc MSc CGeol FGS FRGS
Managing Director

Rev No	Status	Revision Details	Date	Approved for Issue
0	Final		9 February 2023	
1	Final	Requested amendments	31 March 2023	

This report has been issued by the GEA office indicated below. Any enquiries regarding the report should be directed to the report project engineer at the office indicated or to Steve Branch in our main Herts office.

✓	Hertfordshire	tel 01727 824666
	Nottinghamshire	tel 01509 674888
	Manchester	tel 0161 209 3032

Geotechnical & Environmental Associates Limited (GEA) disclaims any responsibility to the Client and others in respect of any matters outside the scope of this work. This report has been prepared with reasonable skill, care and diligence within the terms of the contract with the Client and taking account of the manpower, resources, investigation and testing devoted to it in agreement with the Client. This report is confidential to the Client and GEA accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known, unless formally agreed beforehand. Any such party relies upon the report at their own risk. This report may provide advice based on an interpretation of legislation, guidance notes and codes of practice. GEA does not however provide legal advice and if specific legal advice is required a lawyer should be consulted.

This report is intended as a Ground Investigation Report (GIR) as defined in BS EN1997-2, unless specifically noted otherwise. The report is not a Geotechnical Design Report (GDR) as defined in EN1997-2 and recommendations made within this report are for guidance only.

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Contents

Executive Summary

Part 1: Investigation Report

1.0 Introduction 1

2.0 The Site 2

3.0 Exploratory Work 5

4.0 Ground Conditions 6

Part 2: Design Basis Report

5.0 Introduction 8

6.0 Ground Model 8

7.0 Advice & Recommendations 9

8.0 Outstanding Risks & Issues 12

Appendix

Executive summary

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

Brief

This report describes the findings of a site investigation carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of Picture Estates Ltd, with respect to the redevelopment of the site through the construction of a new residential estate including houses, communal and private soft landscaping and new hardstanding and surface water drainage. The purpose of the investigation has been to research the history of the site with respect to possible contaminative uses, to determine the ground conditions, to provide an indication of the presence of contamination and to provide information to assist with the design of new foundations and hardstanding.

Site history

The earliest map studied, dated 1884, shows the site to have been undeveloped, comprising an area of open fields with a similar configuration to that of the existing fields, with Dell Spring shown in its existing position in the northwest of the site. The existing roads to the northeast and northwest are also shown on the map and New Spring is also labelled in the south of the site. Tile Kiln Farm and Dane End Farm are detailed in their existing positions, to the west and east of the site respectively. A chalk pit is labelled close to the centre of the site on the next map studied, dated 1899. Additional small chalk pits, gravel pits and brick fields were present in the surrounding area, with the closest located about 120 m to the west of the site. On the map dated 1924, the area of woodland near the chalk pit is shown to have increased in size and is labelled as Nine Acre Spring. The site and surrounding area remained essentially unchanged until some time between 1976 and 1979. On the map dated 1979 many of the existing buildings and much of the road network of Stevenage is shown extending to about 200 m from the southern boundary of the site. A new housing estate was constructed to the south of the site between 1999 and 2006 and the site and surrounding area have since remained essentially unchanged.

Ground conditions

The investigation has generally confirmed the expected ground conditions in that, beneath a nominal thickness of made ground, Superficial Deposits were encountered over the Lewes Nodular Chalk Formation and Seaford Chalk Formation. The made ground comprised dark brown silty sandy clay with gravel and rootlets, and extended to depths of between 0.10 m and 0.50 m. The superficial deposits generally comprised firm to stiff brown to orange-brown and reddish brown slightly sandy clay with variable fine to coarse subangular to subrounded chalk and flint gravel. The proportion of chalk gravel generally increased with depth. These deposits extend to depths of between 0.80 m and 7.00 m. The thickness of this stratum appears to be more consistently thick in the west of the site, with the thickness reducing to the east. However, there is also significant variation in the depth of the base of this stratum within investigation points in close proximity to each other, for example, Borehole No 1 found the base of the superficial deposits to be at a depth of 7.00 m, and Trial Pit No 2, located about 10.00 m to the south of Borehole No 1, found the base of the superficial deposits to be at a depth of 2.06 m below ground level. Additionally, this type of variation does not appear to simply be dependent on relative ground level. In Trial Pit No 3 a layer of pale brown very clayey silty sand with fine to coarse subangular to subrounded gravel was encountered from 0.80 m to the full depth of the trial pit of 1.95 m.

The top of the Lewes Nodular Chalk Formation and Seaford Chalk Formation was encountered at depths of between 0.80 m and 7.00 m. The chalk was generally recovered as structureless off-white silty clay with occasional fragments of low density and occasionally medium density chalk with occasional reddish-brown staining. On the basis of the inspection of recovered samples, the chalk has been classified in accordance with CIRIA Report C574 (2002), Engineering in Chalk, with the chalk generally comprising structureless chalk composed of angular fine to coarse sand and gravel sized clasts of chalk in a comminuted chalk matrix. The gravel was of low and occasionally medium density. The chalk was initially assessed as Grade Dm in the boreholes, although the sampling will have resulted in disturbance of the material and the recovered samples will not be indicative of the in-situ condition. Across the site, a weaker upper weathered zone of the chalk was initially encountered and the condition of the chalk appears to improve with depth.

Groundwater was not encountered during drilling and the standpipes have been found to be dry during a single monitoring visit carried out to date.

Contamination testing has indicated the samples tested to be free from elevated concentrations of contaminants.

Recommendations

Moderate width strip or pad foundations bearing on the firm clay of the Superficial Deposits should be placed at a minimum depth of 1.5 m, allowing for restricted new planting in accordance with Table 4 of NBHC Standards Chapter 4.2 (2023). If trees are excluded within the zone of influence shown in Table 4 of the NHBC guidance, the minimum depth can be reduced to 1.00 m subject also to the further advice on new tree and shrub planting as detailed in the NHBC guidelines. The foundations may be designed to apply a net allowable bearing pressure of 100 kN/m^2.

A requirement for remedial measures is not envisaged.

Part 1: Investigation Report

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 Introduction

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Picture Estates Limited to carry out a desk study and ground investigation at Great Ashby, Stevenage, Hertfordshire SG4 7EA.

1.1 Proposed Development

It is understood that it is proposed to develop the site through the construction of a number of low rise residential buildings along with new areas of hardstanding and both communal and private areas of soft landscaping.

This report is specific to the proposed development and the advice herein should be reviewed once the development proposals are finalised.

The exact layout and specification of the proposed development are not known.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to check the history of the site with respect to previous contaminative uses;
- to provide an assessment of the risk of encountering UXO;
- to determine the ground conditions and their engineering properties;
- to use the above information to provide recommendations for the design of new foundations;
- to provide an indication of the degree of soil contamination present; and
- to assess the risk that any such contamination may pose to the proposed development, its users or the wider environment.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out, followed by a ground investigation. The desk study comprised:

- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Envirocheck database;
- a review of readily available geology maps; and
- a walkover survey of the site carried out in conjunction with the fieldwork.

In the light of this desk study an intrusive ground investigation, carefully identified and specified by Wormald Burrows Partnership and later reviewed by Woods Hardwick Limited, was carried out which comprised, in summary, the following activities:

- three boreholes advanced to a depth of 15 m by a standard cable percussion rig;
- eight opendrive sampler boreholes advanced to depths of between 5.45 m and 6.45 m;
- nine machine excavated trial pits advanced to depths of between 1.80 m to 2.50 m;
- standard penetration tests (SPTs) carried out at regular intervals within the boreholes to provide quantitative data on the strength of the soils;
- the installation of three groundwater monitoring standpipes to 15.00 m, and two subsequent monitoring visits;
- testing of selected soil samples for contamination and geotechnical purposes; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

This report includes a contaminated land assessment which has been undertaken by a suitably qualified and competent professional in accordance with the methodology

presented by the Environment Agency in their Land contamination risk assessment (LCRM)[1] published 19 April 2022. This involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation within the United Kingdom. Risk management is divided into three stages; Risk Assessment, Options Appraisal and Remediation, and each stage comprises three tiers. The Risk Assessment stage includes preliminary risk assessment (PRA), generic quantitative risk assessment (GQRA) and detailed quantitative risk assessment (DQRA) and this report includes the PRA and GQRA.

The exploratory methods adopted in this investigation have been selected on the basis of the constraints of the site including but not limited to access and space limitations, together with any budgetary or timing constraints. Where it has not been possible to reasonably use an EC7 compliant investigation technique a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

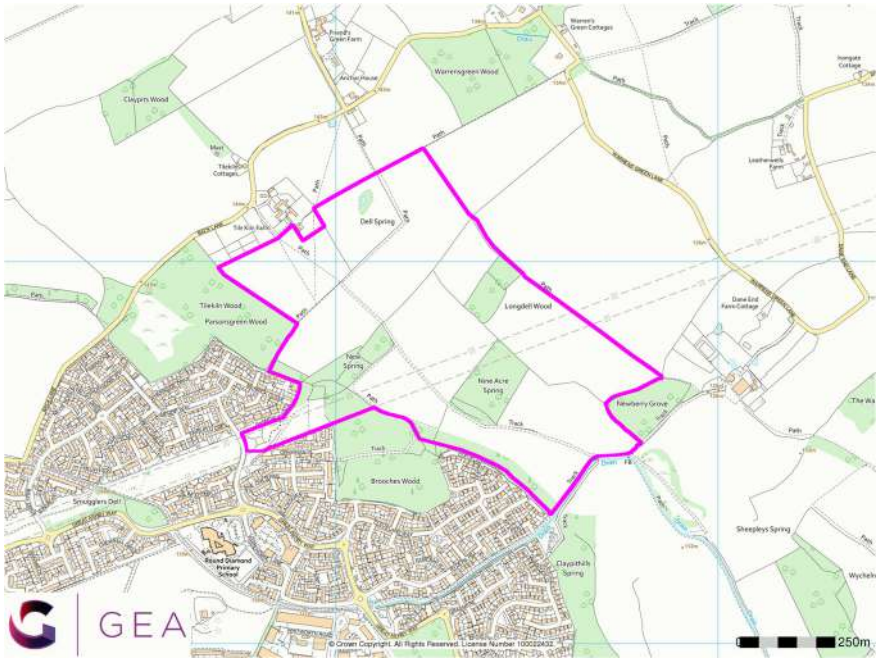
1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or ground water samples tested. No liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

2.0 The Site

2.1 Site Description

The site is located to the northeast of Stevenage, approximately 4.40 km northeast of Stevenage Railway Station and 1.75 km south of the village of Weston. The site forms part of a wider area of farmland with no direct road links or significant bounding features to the north, east or west, and an estate of houses to the southwest. The site may be additionally located by National Grid Reference 527032, 227695 and is shown on the map extract below.



A walkover of the site was carried out by a geotechnical engineer from GEA at the time of the fieldwork. The site is irregular in shape and measures approximately 975 m southeast-

[1] https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

northwest by 425 m northeast-southwest. At the time of the investigation it was completely undeveloped, comprising part of a farm with much of the land being given over to the growth of pasture over the winter, which comprised grasses and the remnants of former crops. Two areas of woodland are included within the site boundary, close to the centre of the site, which comprise mature deciduous trees of up to about 25 m in height. The site is largely roughly level although the east of the site slopes down to the south and east. Numerous public footpaths cross the site and overhead power lines also cross the site close to its centre, orientated approximately east-west.

2.2 Site History

The site history has been researched by reference to internet sources and historical Ordnance Survey (OS) maps obtained from the Envirocheck database.

The earliest map studied, dated 1884, shows the site to have been undeveloped, comprising an area of open fields with a similar configuration to that of the existing fields, with Dell Spring shown in its existing position in the northwest of the site. The existing roads to the northeast and northwest are also shown on the map and New Spring is also labelled in the south of the site. Tile Kiln Farm and Dane End Farm are detailed in their existing positions, to the west and east of the site respectively.

A chalk pit is labelled close to the centre of the site on the next map studied, dated 1899. Additional small chalk pits, gravel pits and brick fields were present in the surrounding area, with the closest located about 120 m to the west of the site. On the map dated 1924, the area of woodland near the chalk pit is shown to have increased in size and is labelled as Nine Acre Spring.

The site and surrounding area remained essentially unchanged until some time between 1976 and 1979. On the map dated 1979 many of the existing buildings and much of the road network of Stevenage is shown extending to about 200 m from the southern boundary of the site. A new housing estate was constructed to the south of the site between 1999 and 2006 and the site and surrounding area have since remained essentially unchanged.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required.

The Envirocheck report does not record any landfill sites located within 1 km of the site and additionally, no waste management or waste transfer sites are located within 500 m of the site. A single area of potentially infilled land is listed within 250 m of the site, located 227 m northwest of the site. It is recorded as an area of unknown filled ground which was mapped in 1994.

No pollution incidents to controlled waters have been recorded within 1 km of the site.

Relatively small areas of the site are shown by the Environment Agency to be at low to high risk from flooding from surface water and the site is not considered to be at risk of flooding from rivers or the sea.

The site is located in close proximity to numerous areas of Ancient Woodland and lies within an area of adopted greenbelt. It also lies within a nitrate vulnerable zone for both groundwater and surface water.

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1% of homes are affected by radon emissions and therefore radon protective measures will not be necessary.

2.4 Geology

The British Geological Survey (BGS) map of the area indicates that the site is underlain by the Lewes Nodular Chalk Formation and Seaford Chalk Formation, which is overlain by superficial Head Deposits across the central and southeast of the site and the Lowestoft Formation in the southwest of the site, as well as along the north eastern site boundary.

A search of the BGS Geo Index Onshore archive has revealed the records of two boreholes carried out in the southeast of the site. The boreholes encountered superficial deposits, extending to depths of 0.91 m and 1.37 m, below which chalk was encountered and was found to extend to the full depth of the investigation of 9.14 m. The superficial deposits are described as “topsoil and subsoil with flintstone, sand and chalk content” and in one of the boreholes the chalk was described as “hard chalk” while in the other borehole it is described

as comprising three layers, an initial layer of "soft chalk", extending to a depth of 3.05 m, below which "soft chalk with hard pieces" was described, extending to a depth of 5.79 m, which was underlain by "hard chalk".

2.5 Hydrology and Hydrogeology

Envirocheck records the Head Deposits and Lowestoft Formation to be classified as a Secondary Aquifer (undifferentiated), which refers to permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers as defined by the Environment Agency (EA). The chalk is classified as a Principal Aquifer by the EA, which refers to layers of rock or drift deposits that have high intergranular and / or fracture permeability, which means that they usually provide a high level of water storage and may supply river base flow on a strategic scale. Principal Aquifers were formerly classified as Major Aquifers.

Groundwater observations are not recorded on the BGS archive borehole records referred to in section 2.4.

The nearest surface water feature to the site is a spring located in the northwest of the site. The closest off-site surface water feature appears to be a drainage ditch, part of which traces the eastern boundary of the site.

2.6 Preliminary Risk Assessment

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.

2.6.1 Source

The desk study findings indicate that the site does not have a potentially contaminative history as it has apparently remained undeveloped throughout its known history.

2.6.2 Receptor

The proposed redevelopment of the site for residential purposes will result in the end users representing relatively high sensitivity receptors. As the site is underlain by both Secondary and Principal Aquifer, adjacent sites and groundwater are considered to be a moderately sensitive receptors. Buried services are likely to come into contact with any contaminants present within the soils through which they pass and site workers are potential receptors during construction or maintenance works.

2.6.3 Pathway

The variable nature of the superficial deposits and the high permeability of the Chalk would allow the migration of contaminated groundwater through the shallow soils to surrounding sites as well as the percolation of contaminated water into the principle aquifer at depth within the Chalk. Within the site, end users will be isolated from direct contact with any contaminants present within the made ground by the presence of the new buildings and areas of hardstanding. Therefore, only in areas of communal landscaping or private gardens, would end users come into direct contact with any contamination within the soil. Buried services may be exposed to any contaminants present within the soil through direct contact and site workers will come into contact with the soils during construction works. There is thus considered to be a low to moderate potential for a contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

2.6.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a VERY LOW risk of there being a significant contaminant linkage at this site which would result in a requirement for major remediation work.

3.0 Exploratory Work

In order to meet the objectives described in Section 1.2, three boreholes were advanced to a depth of 15.00 m using a standard cable percussion rig. Additionally, eight opendrive percussive sampler boreholes were advanced to depths of between 5.45 m and 6.45 m and nine machine dug trial pits were excavated to depths of between 1.80 m and 2.50 m to provide further coverage of the site.

Three groundwater monitoring standpipes have been installed to a depth of 15.00 m to facilitate groundwater monitoring, which has been carried out on a single occasion to date, approximately four weeks after installation.

During boring, disturbed and undisturbed samples were obtained from the boreholes for subsequent laboratory examination and testing. Standard Penetration Tests (SPTs) were carried out at regular intervals to provide additional quantitative data on the strength of soils encountered. A selection of the samples recovered from the boreholes was submitted to a soil mechanics laboratory for a programme of geotechnical testing and an analytical laboratory for a programme of contamination testing.

Soakage testing was carried out within each of the trial pits in general accordance with BRE 365 to provide information to inform the design of new soakaway drainage. It should be noted that where it was not possible to include a test during a single day, the soakage rate was considered to be low such that the use of shallow soakaways would not be feasible in that part of the site. No further testing was carried out in this case.

A total of 16 in-situ California Bearing Ratio (CBR) tests was carried out across the site, each at a depth of 0.40 m.

All of the above work was carried out under the supervision of a geotechnical engineer from GEA. The borehole and trial pit records are appended, together with a site plan indicating the exploratory positions.

3.1 Sampling Strategy

The scope and the trial pit and borehole locations were carefully identified and redacted by civil engineers at Wormald Burrows Partnership Ltd and were later reviewed by Woods Hardwick Ltd. The scope was reviewed by GEA and was assessed to be appropriate for purpose. The boreholes and trial pits were positioned as close to the specified positions as possible.

Twelve samples of the made ground have been tested for the presence of contamination. The analytical suite of testing was selected to identify hydrocarbon contamination resulting from the former use of the site and a range of typical industrial contaminants for the purposes of general coverage. The analytical suite for the soil included a range of metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. The analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTs standards. A summary of the MCERTs accreditation and test methods are included with the attached results and further details are available upon request.

4.0 Ground Conditions

The investigation has generally confirmed the expected ground conditions in that, beneath a nominal thickness of made ground, Superficial Deposits were encountered, over the Lewes Nodular Chalk Formation and Seaford Chalk Formation.

4.1 Made Ground

The made ground comprised dark brown silty sandy clay with gravel and rootlets, and extended to depths of between 0.10 m and 0.50 m.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Twelve samples of the made ground have however been analysed for a range of contaminants as a precautionary measure and the results are detailed within Section 4.5.

4.2 Superficial Deposits

The superficial deposits generally comprised firm to stiff brown to orange-brown and reddish brown slightly sandy clay with variable fine to coarse subangular to subrounded chalk and flint gravel. The proportion of chalk gravel generally increase with depth. These deposits extend to depths of between 0.80 m and 7.00 m. It should be noted that the thickness of this stratum appears to be more consistently thick in the west of the site, with the thickness reducing to the east. However, there is also significant variation in the depth of the base of this stratum within investigation points in close proximity to each other, for example, Borehole No 1 found the base of the superficial deposits to be at a depth of 7.00 m, and Trial Pit No 2, located about 10.00 m to the south of Borehole No 1, found the base of the superficial deposits to be at a depth of 2.06 m below ground level. Additionally, this type of variation does not appear to simply be dependent on relative ground level.

In Trial Pit No 3 a layer of pale brown very clayey silty sand with fine to coarse subangular to subrounded gravel was encountered from 0.80 m to the full depth of the trial pit of 1.95 m.

The results of the results of plasticity index tests indicate the clay to be of low to high volume change potential.

4.3 Lewes Nodular Chalk Formation and Seaford Chalk Formation

The top of the Lewes Nodular Chalk Formation and Seaford Chalk Formation was encountered at depths of between 0.80 m and 7.00 m. The chalk was generally recovered as structureless off-white silty clay with occasional fragments of low density and occasionally medium density chalk with occasional reddish-brown staining.

On the basis of the inspection of recovered samples, the chalk has been classified in accordance with CIRIA Report C574 (2002), Engineering in Chalk, with the chalk generally comprising structureless chalk composed of angular fine to coarse sand and gravel sized clasts of chalk in a comminuted chalk matrix. The gravel was of low and occasionally medium density. The chalk was initially assessed as Grade Dm in the boreholes, although the sampling will have resulted in disturbance of the material and the recovered samples will not be indicative of the in-situ condition.

Across the site, a weaker upper weathered zone of the chalk was initially encountered and the condition of the chalk appears to improve with depth.

4.4 Groundwater

Groundwater was not encountered during drilling and the standpipes have been found to be dry during a single monitoring visit carried out to date.

4.5 Soil Contamination

The table below sets out the values measured within the 12 samples analysed; all concentrations are in mg/kg unless otherwise stated.

Determinant	Maximum Concentration	Minimum Concentration	Screening Value	No of Samples Elevated above Screening Value
pH	7.9	7.1	NA	NA
Arsenic	27	11	37	None
Cadmium	0.5	<0.2	26	None
Chromium	40	18	910	None
Lead	38	13	200	None
Mercury	<0.3	<0.3	40	None

Determinant	Maximum Concentration	Minimum Concentration	Screening Value	No of Samples Elevated above Screening Value
Selenium	<1.0	<1.0	350	None
Copper	43	7.5	2400	None
Nickel	37	13	180	None
Zinc	78	40	3700	None
Total Cyanide	<1.0	<1.0	140	None
Total Phenols	<1.0	<1.0	184	None
Total PAH	9.18	<0.80	62.1	None
Sulphide	3.5	<1.0	50	None
Benzo(a)pyrene	0.57	<0.05	4.35	None
Naphthalene	0.07	<0.05	2.30	None
TPH	21	<10	500	None
Total Organic Carbon %	0.3	4.2	6	None

Note: The use of the normalised upper bound for 95th percentile confidence aims to remove some of the uncertainty associated with

All of the samples were screened for the presence of asbestos and none was detected.

4.5.1 Generic Quantitative Risk Assessment

The use of a risk-based approach has been adopted to provide an initial screening of the test results to assess the need for subsequent site-specific risk assessments. Contaminants of concern are those that have values in excess of generic human health risk-based guideline values, which are either the CLEA[2] Soil Guideline Values where available, the Suitable 4 Use Values[3] (S4UL) produced by LQM/CIEH calculated using the CLEA UK Version 1.07[4] software, or the DEFRA Category 4 Screening values[5], assuming a residential end use with plant uptake. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be young female children aged less than six years old;
- that the exposure duration will be six years;
- that the critical exposure pathways will be indoor and outdoor dust ingestion, ingestion of soil adhering to homegrown produce, skin contact with indoor dust, and inhalation of indoor and outdoor dust and vapours; and
- that the building type equates to a two-storey small terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site. The tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

Where contaminant concentrations are measured at concentrations below the generic screening value it is considered that they pose an acceptable level of risk and thus further consideration of these contaminant concentrations is not required. However, where concentrations are measured in excess of these generic screening values there is considered to be a potential that they could pose an unacceptable risk and thus further action will be required which could include;

- additional testing to zone the extent of the contaminated material and thus reduce the uncertainty with regard to its potential risk;
- site specific risk assessment to refine the assessment criteria and allow an assessment to be made as to whether the concentration present would pose an unacceptable risk at this site; or
- soil remediation or risk management to mitigate the risk posed by the contaminant to a degree that it poses an acceptable risk.

The results of the chemical analyses have indicated the samples tested to be free from elevated concentrations of contaminants. The significance of these results is considered further in Part 2 of the report.

2 *Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009* and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.
3 *The LQM/CIEH S4Uls for Human Health Risk Assessment* S4UL3065 November 2014
4 Contaminated Land Exposure Assessment (CL|EA) Software Version 1.071 Environment Agency 2015
5 CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

Part 2: Design Basis Report

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the proposed development.

5.0 Introduction

It is understood that it is proposed to construct a new low-rise residential development which will include residential units, communal soft landscaping and private gardens as well as new hardstanding.

The details of the development and the loading are not known but the loads are anticipated to be light to moderate.

6.0 Ground Model

The desk study has revealed that the site has not had a potentially contaminative historical use as it has been undeveloped for its entire developed history, and on the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- below a nominal thickness of made ground, Superficial Deposits are present, below which the Lewes Nodular Chalk Formation and Seaford Chalk Formation which extends to the maximum depth of the investigation, of 15.00 m;
- the made ground comprises dark brown silty sandy clay with gravel and rootlets and extends to depths of between 0.10 m and 0.50 m;
- the Superficial Deposits generally comprise firm to stiff brown to orange-brown and reddish brown slightly sandy clay with variable fine to coarse subangular to subrounded chalk and flint gravel and extends to a depth of between 0.80 m and 7.00 m;
- the Superficial Deposits are generally consistently thicker in the north and west of the site but the depth to the chalk varies significantly in parts of the site;
- the Lewes Nodular Chalk and Seaford Chalk Formations were recovered as structureless off-white silty clay with occasional fragments of low density to medium density chalk gravel (Grade Dm);
- the condition of the chalk appears to improve with depth;
- groundwater is not present at shallow depths beneath the site; and
- contamination testing has revealed the made ground to be free from elevated concentrations of contaminants.

7.0 Advice & Recommendations

In view of the anticipated light to moderate load, the use of shallow spread foundations should be feasible.

7.1 Spread Foundations

Moderate width strip or pad foundations bearing on the firm clay of the Superficial Deposits should be placed at a minimum depth of 1.50 m, allowing for restricted new planting in accordance with Table 4 of NBHC Standards Chapter 4.2 (2023). If trees are excluded within the zone of influence shown in Table 4 of the NHBC guidance, the minimum depth can be reduced to 1.00 m subject also to the further advice on new tree and shrub planting as detailed in the NHBC guidelines. The foundations may be designed to apply a net allowable bearing pressure of 100 kN/m^2. This value incorporates an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits. The recommended bearing pressure takes account of the variable nature of the soils and any foundations should be nominally reinforced where they span clay and granular material to protect against differential settlement.

Foundations will need to be deepened in the vicinity of existing and proposed trees and National House Building Council (NHBC) guidelines should be followed in this respect. High shrinkability clays should be assumed. Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted. Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation. In this respect it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. Due allowance should be made for future growth of the trees.

The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines. If trees are to be planted in close proximity to the new buildings founding depths should be deepened in accordance with NHBC guidelines and using the mature height of the tree. High shrinkability clay should be assumed.

7.2 Piled Foundations

For the ground conditions at this site some form of bored pile could be considered. In view of the limited thickness of made ground and underlying clay soils, conventional rotary bored piles could be adopted with relatively short lengths of casing or consideration could be given to the use of bored piles installed using continuous flight auger (cfa) techniques, which would negate the requirement for temporary casing.

The following table of ultimate coefficients may be used for the preliminary design of bored piles, based on the SPT and cohesion / level graph in the appendix.

Stratum	Depths m [level m OD]	kN / m^2
Ultimate Skin Friction		
Made Ground	GL to 0.50	Ignore
Superficial Deposits (clay)	0.50 to 5.00	Increasing linearly from 10 to 32
Chalk	5.00 to 15.00	Increasing linearly from 40 to 120
Ultimate End Bearing		
Chalk	10.00 to 15.00	Increasing linearly from 6,000 to 10,000

A factor of safety of 3.0 should be applied to the above coefficients in the computation of safe theoretical working loads. On the basis of the above coefficients, the following pile capacity has been estimated.

Pile diameter (mm)	Toe Depth (m)	Effective Pile length (m)	Safe Working Load (kN)
450	10.00	9.50	600

The above example is not intended to constitute any form of recommendation with regard to pile size or type, but merely serve to illustrate the use of the above coefficients.

Specialist piling contractors should be consulted with regard to the design of a suitable piling scheme and their attention should be drawn to potential groundwater inflows and instability where granular layers are encountered and the presence of occasional cobbles

within the Superficial Deposits and Chalk. As with any situation where bored piles are constructed in chalk, consideration will need to be given to the possibility of variations in the level and quality of the chalk and the possibility of undetected significant variations between borehole positions.

7.3 Shallow Excavations

On the basis of the borehole findings it is considered that it will be generally feasible to form relatively shallow excavations terminating within the Superficial Deposits or the Chalk without the requirement for lateral support, although localised instabilities may occur where more granular material or groundwater is encountered.

Significant inflows of groundwater into shallow excavations are not generally anticipated, although seepages may be encountered from perched water tables within the made ground, although such inflows should be suitably controlled by sump pumping.

If deeper excavations are considered or if excavations are to remain open for prolonged periods it is recommended that provision be made for battered side slopes or lateral support. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

7.4 Ground Floor Slab

Where buildings are proposed within the zone of influence of existing trees to be retained or removed, due to the presence of cohesive soil at formation level with potentially high volume change potential, it is recommended that the floor slabs for the new buildings are constructed over a suitable void, void former or layer of compressible material. Outside of the zone of influence of trees, it should be possible to adopt a lightly loaded ground bearing floor slab.

7.5 Effect of Sulphates

Chemical analyses have revealed relatively low concentrations of soluble sulphate and near-neutral pH in accordance with Class DS-1 conditions of Table C2 of BRE Special Digest 1:SD Third Edition (2005). The measured pH values of the samples show that an ACEC class of AC-1 would be appropriate for the site. This assumes a mobile water condition at the site. The guidelines contained in the digest should be followed in the design of foundation concrete.

7.6 Soakaway Design

The results of the BRE365 soakage testing have indicated that the use of shallow soakaways within the Superficial Deposits or the upper chalk will not be generally feasible due to low soakage rates, which are detailed in the table below.

Trial Pit No	Test No	Soakage Rate (m/s)
1	1	$1.1x10^{-6}$
2	1	$3.9x10^{-7}$
3	1	$1.7x10^{-6}$
4	1	$4.9x10^{-5}$
	2	$2.3x10^{-5}$
	3	$3.1x10^{-5}$
5	1	$1.5x10^{-6}$
6	1	$1.1x10^{-6}$
7	1	$5.1x10^{-6}$
8	1	$-2.2x10^{-6}$
9	1	0.0

Borehole soakaway tests were carried out in each of the cable percussion boreholes at a depth of 15.00 m and the results have indicated that the use of deep soakaways should be

feasible, but should be constructed no closer than 10 m from any buildings, road or structure foundations in accordance with CIRIA C574[6] .

The full results given in the appendix should be used for design, which should follow BRE365.

The use of soakaways will need to be agreed with the Environment Agency.

7.7 Design of New Hardstanding

The results of the 16 in-situ CBR tests carried out at a depth of 0.40 have indicated that a CBR value of around 3.5% should apply with respect to new areas of hardstanding constructed within the Superficial Deposits. It should be noted that if new hardstanding is proposed within the existing made ground, a maximum CBR value of 2% would be suitable.

7.8 Contamination Risk Assessment

The desk study findings indicate that the site does not have a potentially contaminative history as it has apparently remained undeveloped throughout its known history and as a result, no sources of contamination are considered to be present within the boundaries of the site. The results of the chemical analyses have indicated the samples tested to be free from elevated concentrations of contaminants. As a result, a requirement for remedial measures is not generally envisaged. However, in view of the relatively few samples tested over an area of this size, a watching brief should be maintained throughout the groundworks and if potentially contaminated soil is encountered, work should stop and the contamination should be assessed by a suitably qualified engineer.

7.9 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should however be noted that the Environment Agency guidance WM3[7] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[8] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £98.60 per tonne (about £185 per m^3) or at the lower rate of £3.15 per tonne (roughly £5.85 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

Based on the technical guidance provided by the EA it is considered likely that the soils encountered during this ground investigation, as represented by the chemical analyses carried out, would be generally classified as follows.

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Current applicable rate of Landfill Tax
Made ground	Non-hazardous (17 05 04)	No	£98.60/tonne (Standard rate)
Natural Soil	Inert non-hazardous (17 05 04)	Should not be required but confirm with receiving landfill	£3.15 / tonne (Reduced rate for uncontaminated naturally occurring rocks and soils)

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[9] which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can

6 CIRIA C574 *Engineering in Chalk,* 2002.
7 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition
8 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2
9 Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement*

be segregated onsite prior to excavation by sufficiently characterising the soils insitu prior to excavation.

The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified. The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing.

8.0 Outstanding Risks & Issues

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work may be required.

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

If during ground works any visual or olfactory evidence of contamination is identified it is recommended that further investigation be carried out and that the risk assessment is reviewed.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

Appendix

a. Field Work

Site Plan
Borehole Records
Trial Pit Records
CBR Test Results
Trial Pit Soakage Test Results
Borehole Soakage Test Results

b. Lab Testing

Geotechnical Test Results
SPT & Cohesion/Depth Graph
Chemical Test Results
Generic Risk Based Screening Values

c. Desk Study

Risk Assessment Tables
Envirocheck Extracts
Historical Maps

appendix a

Field Work

Site Plan
Borehole Records
Trial Pit Records
CBR Test Results
Trial Pit Soakage Test Results
Borehole Soakage Test Results

GEA

Geotechnical & Environmental Associates

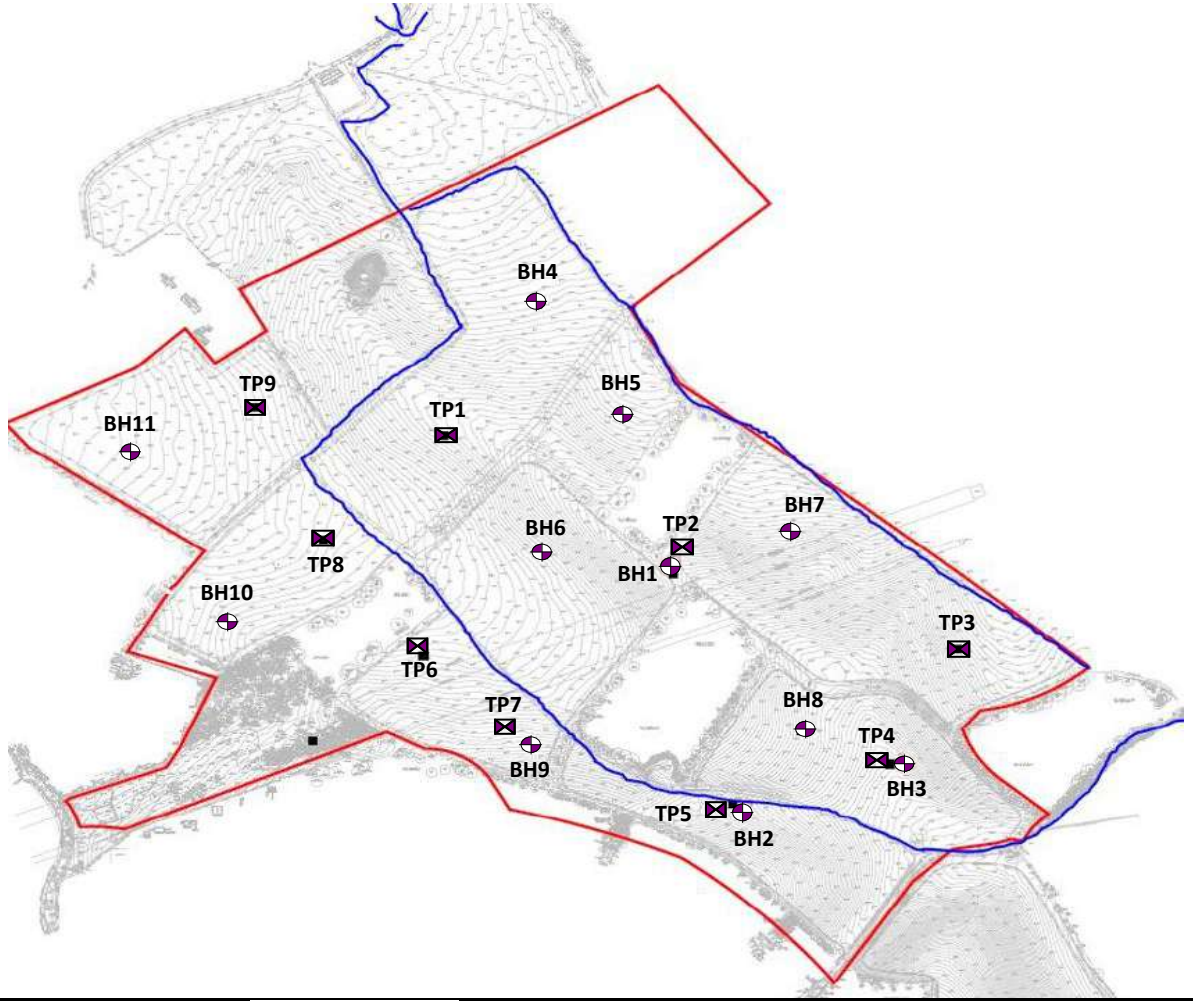
www.gea-ltd.co.uk

Site Plan

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Agent	

Job Number J22372

Sheet 1 / 1





Approximate scale in metres

0 100 200 300

GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	200 mm to 8.00 m 150 mm to 14.00 m		Picture Estates Limited	J22372
	Location	**Dates** 08/12/2022- 09/12/2022	**Engineer**	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL (dark brown silty sandy clay wirh gravel and rootlets)		
0.30	D1					0.30			
0.50	D2						Firm brown silty sandy CLAY		
1.00	D3					(1.70)			
1.20-1.65	D4								
1.75	D5								
2.00-2.45	SPT N60=23	2.00	DRY	2,3/5,6,6,8		2.00	Stiff brown silty sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
2.00-2.45	D6								
2.75	D7								
3.00-3.45	D8								
3.75	D9								
4.00-4.45	SPT N60=36	4.00	DRY	5,7/9,8,10,12		(4.00)			
4.00-4.45	D10								
4.75	D11								
5.00-5.45	SPT N60=39	5.00	DRY	4,6/8,10,11,13					
5.00-5.45	D12								
6.00	D13					6.00	Stiff greyish-brown CLAY with fine to coarse subangular to subrounded flint and chalk gravel		
6.50-6.95	SPT N60=26	6.00	DRY	3,4/6,6,8,8		(1.00)			
6.50-6.95	D14								
						7.00	CHALK recovered as stiff silty clay with fine to coarse flint and chalk gravel and occasional flint cobbles		
7.50	D15								
8.00-8.45	SPT N60=21	8.00	DRY	4,5/5,6,6,6					
8.00-8.45	D16								
9.00	D17								
9.50-9.95	SPT N60=23	9.50	DRY	5,6/6,7,6,6					
9.50-9.95	D18								

Remarks
Groundwater not encountered
Soakaway test carried out at 15.00 m.
Standpipe installed to a depth of 15.00 m.

Scale (approx)	Logged By
1:50	Prelim

Figure No.
J22372.BH2

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number **BH1**
Boring Method Cable Percussion	**Casing Diameter** 200 mm to 8.00 m 150 mm to 14.00 m	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 08/12/2022- 09/12/2022	**Engineer**	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D19								
11.00-11.45 11.00-11.45	SPT N60=27 D20	11.00	DRY	4,6/6,8,8,7		(8.00)			
12.00	D21								
12.50-12.95 12.50-12.95	SPT N60=30 D22	12.00	DRY	5,7/8,8,9,8					
13.50	D23								
14.00-14.45 14.00-14.45	SPT N60=45 D24	14.00	DRY	6,8/9,11,13,16					
14.50	D25								
15.00-15.30 15.00-15.45	SPT 75/150 D26	14.00	DRY	8,10/25,50		15.00	Complete at 15.30m		

Remarks

Scale (approx)	Logged By
1:50	Prelim

Figure No.
J22372.BH2

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number **BH2**

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	200 mm to 9.50 m 150 mm to 10.00 m		Picture Estates Limited	J22372
	Location	**Dates** 12/12/2022- 13/12/2022	**Engineer**	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1					(0.50)	TOPSOIL (dark brown silty sandy clay wirh gravel and rootlets)		
0.50	B2					0.50	Firm silty sandy CLAY with fine to coarse subangular to subrounded flint and chalk gravel		
1.00	D3								
1.20-1.65	SPT(C) N60=7	1.00	DRY	1,2/2,2,2,2					
1.20-1.65	D4					(2.00)			
1.75	D5								
2.00-2.45	SPT(C) N60=8	2.00	DRY	2,2/2,3,2,2					
2.00-2.45	D6								
						2.50	CHALK recovered as soft to firm off-white silty clay with occasional fine to coarse flint gravel and occasional cobbles		
2.75	D7								
3.00-3.45	SPT N60=9	3.00	DRY	2,3/2,3,2,3					
3.00-3.45	D8								
3.75	D9								
4.00-4.45	SPT N60=13	4.00	DRY	3,3/3,4,3,4					
4.00-4.45	D10								
4.75	D11								
5.00-5.45	SPT N60=14	5.00	DRY	2,3/3,4,4,4					
5.00-5.45	D12								
6.00	D13								
6.50-6.95	SPT N60=11	6.00	DRY	2,3/3,3,3,3		(7.50)			
6.50-6.95	D14								
7.50	D15								
8.00-8.45	SPT N60=18	8.00	DRY	3,4/4,5,5,6					
8.00-8.45	D16								
9.00	D17								
9.50-9.95	SPT N60=30	9.50	DRY	4,6/6,8,8,11					
9.50-9.95	D18								

Remarks
Groundwater not encountered
Soakaway test carried out at 2.50 m and 15.00 m.
Standpipe installed to a depth of 15.00 m.

Scale (approx)	Logged By
1:50	Preim

Figure No.
J22372.BH2

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number **BH2**

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	200 mm to 9.50 m 150 mm to 10.00 m		Picture Estates Limited	J22372
	Location	**Dates** 12/12/2022- 13/12/2022	**Engineer**	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						10.00	CHALK recovered as stiff silty clay with fine to coarse flint and chalk gravel and occasional flint cobbles		
10.50	D19								
11.00-11.45	SPT N60=45	10.00	DRY	5,7/9,11,13,16					
11.00-11.45	D20								
12.00	D21								
12.50-12.95	SPT N60=49	10.00	DRY	6,8/10,11,14,18		(5.00)			
12.50-12.95	D22								
13.50	D23								
14.00-14.45	SPT N60=72	10.00	DRY	9,11/14,19,21,25					
14.00-14.45	D24								
15.00-15.15	SPT 23*/75 50/75	10.00	DRY	23/50		15.00	Complete at 15.15m		
15.00-15.45	D25								

Remarks

Scale (approx)	Logged By
1:50	Preim

Figure No.
J22372.BH2

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number **BH3**
Boring Method Cable Percussion	**Casing Diameter** 150 mm to 10.00 m	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 13/12/2022- 14/12/2022	**Engineer**	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1					(0.50)	TOPSOIL (dark brown silty sandy clay wirh gravel and rootlets)		
						0.50	Firm silty sandy CLAY with fine to coarse subangular to subrounded flint and chalk gravel		
1.00	D2								
1.20-1.65 1.20-1.65	SPT(C) N60=10 D3	1.00	DRY	2,2/3,2,3,3		(1.80)			
1.75	D4								
2.00-2.45 2.00-2.45	SPT(C) N60=13 D5	2.00	DRY	2,3/3,4,4,3		2.30			
2.75	D6						CHALK recovered as soft to firm off-white silty clay with occasional fine to coarse flint gravel and occasional cobbles		
3.00-3.45 3.00-3.45	SPT N60=8 D7	3.00	DRY	2,2/2,2,2,3					
3.75	D8								
4.00-4.45 4.00-4.45	SPT N60=14 D9	4.00	DRY	2,3/3,4,4,4					
4.75	D10								
5.00-5.45 5.00-5.45	SPT N60=11 D11	5.00	DRY	2,3/3,3,3,3		(5.70)			
6.00	D12								
6.50-6.95 6.50-6.95	SPT N60=14 D13	6.00	DRY	3,3/4,4,3,4					
7.50	D14								
8.00-8.45 8.00-8.45	SPT N60=31 D15	8.00	DRY	4,4/6,8,8,12		8.00	CHALK recovered as stiff silty clay with fine to coarse flint and chalk gravel and occasional flint cobbles		
9.00	D16								
9.50-9.95 9.50-9.95	SPT N60=41 D17	9.50	DRY	5,6/8,10,12,15					

Remarks
Groundwater not encountered
Soakaway test carried out at 3.00 m and 15.00 m.
Standpipe installed to a depth of 15.00 m.

Scale (approx)	Logged By
1:50	Prelim

Figure No.
J22372.BH2

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Borehole Number BH3
Boring Method Cable Percussion	Casing Diameter 150 mm to 10.00 m	Ground Level (mOD)	Client Picture Estates Limited	Job Number J22372
	Location	Dates 13/12/2022- 14/12/2022	Engineer	Sheet 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D18								
11.00-11.45	SPT N60=49	10.00	DRY	6,7/10,12,14,17					
11.00-11.45	D19					(7.00)			
12.00	D20								
12.50-12.95	SPT N60=42	10.00	DRY	5,7/9,12,11,14					
12.50-12.95	D21								
13.50	D22								
14.00-14.15	SPT 25*/75 50/75	10.00	DRY	25/50					
14.00-14.45	D23								
15.00-15.15	SPT 25*/75 50/75	10.00	DRY	25/50		15.00	Complete at 15.15m		
15.00-15.45	D24								

Remarks	Scale (approx)	Logged By
	1:50	Prelim
	Figure No. J22372.BH2	

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GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Number **BH4**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions** / **Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location / **Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
					(0.75) 1.00	Firm becoming stiff brown slightly silty sandy CLAY with occasional fine to coarse subangular to subrounded flint gravel		
2.50	D2				(3.70)	Stiff orange-brown and reddish brown slightly sandy CLAY with fine to coarse subangular to subrounded flint gravel		
					4.70 (0.75) 5.45	CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay		
						Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
J22372.BH5

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Number **BH5**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions**	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.40) 0.40	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
					(0.80) 1.20	Firm becoming stiff orange-brown sandy CLAY with fine to coarse subangular to subrounded chalk and flint gravel		
2.00	D2				(1.80) 3.00	Stiff orange-brown and reddish brown slightly sandy CLAY with fine to coarse subangular to subrounded chalk and flint gravel		
					(0.70) 3.70	Pale brown silty sandy CLAY with fine to medium chalk gravel		
4.00	D3				(0.20) 3.90	Stiff orange-brown and reddish brown slightly sandy CLAY with fine to coarse subangular to subrounded chalk and flint gravel		
					(2.55) 6.45	CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay		
						Complete at 6.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
J22372.BH5

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Number **BH6**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions**	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.30) 0.30	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
					(2.10)	Stiff reddish brown slightly sandy CLAY with fine to coarse subangular to subrounded flint gravel		
2.00	D2				2.40	CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay		
					(3.05)			
5.00	D3				5.45	Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
J22372.BH5

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	**Site** Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Number** **BH7**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions**	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.30) 0.30	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
1.00	D2				(1.70)	Firm becoming stiff orange-brown and reddish-brown sandy CLAY with fine to coarse subangular to subrounded flint gravel		
4.00	D3				2.00 (3.45)	CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay		
					5.45	Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
J22372.BH5

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Number
BH8

Excavation Method
Opendrive Percussive Sampler (Terrier Rig)

Dimensions

Ground Level (mOD)

Client
Picture Estates Limited

Job Number
J22372

Location

Dates
20/12/2022

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.30) 0.30	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
1.00	D2				(3.70)	Firm becoming stiff brown sandy CLAY with fine to coarse subangular to subrounded flint gravel		
3.00	D3				4.00	CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay with rare pockets of brown clay		
5.00	D4				(1.45) 5.45	Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)
1:50

Logged By
AT

Figure No.
J22372.BH5

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GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Number **BH9**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions** / **Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location / **Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.30) 0.30	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
					(0.50) 0.80	Firm becoming stiff brown and orange-brown sandy CLAY with fine to coarse subangular to subrounded flint gravel		
2.00	D3					CHALK (Grade Dm) recovered as structureless off-white occasionally mottled reddish-brown silty clay		
3.00	D2				(4.65)			
4.00	D4							
					5.45	Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
J22372.BH5

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	**Site** Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Number** **BH10**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions**	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.20) 0.20	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
0.80	D2					Firm becoming stiff light brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.80	D3				(4.30)			
3.50	D4				4.50	Stiff dark brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
					(0.95)			
					5.45	Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	AT

Figure No.
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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Number **BH11**
Excavation Method Opendrive Percussive Sampler (Terrier Rig)	**Dimensions**	**Ground Level (mOD)**	**Client** Picture Estates Limited	**Job Number** J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL (brown silty sandy clay with gravel and rootlets)		
						Firm becoming stiff brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
					(3.60)			
2.50	D1							
3.50	D2							
					3.80			
						Stiff dark brown slightly sandy CLAY with fine to coarse subangular to subrounded gravel		
4.50	D3				(1.65)			
					5.45			
						Complete at 5.45m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
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Figure No.
J22372.BH5

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Trial Pit Number **TP1**
Excavation Method Tracked 8 Tonne Excavator	**Dimensions** 0.90 m x 2.80 m x 2.50 m **Location**	**Ground Level (mOD)** **Dates** 20/12/2022	**Client** Picture Estates Limited **Engineer**	**Job Number** J22372 **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.50	D2					Stiff brown sandy CLAY with fine to coarse subangular to subrounded gravel		
1.50	D3				(2.25)			
					2.50	Complete at 2.50m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Site	Trial Pit Number
Great Ashby, Stevenage, Hertfordshire SG4 7EA	TP2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.70 m x 1.90 m x 2.06 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.50	D2				(1.81)	Firm to stiff orange-brown occasoinally mottled grey silty sandy CLAY with fine to coarse subangular to subrounded chalk and flint gravel		
					2.06	Complete at 2.06m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Site	Trial Pit Number
Great Ashby, Stevenage, Hertfordshire SG4 7EA	TP3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.70 m x 2.30 m x 1.95 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.20) 0.20	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
					(0.60)	Firm to stiff brown very sandy CLAY with abundant fine to coarse subangular to subrounded gravel		
1.00	D2				0.80	Pale brown very clayey silty SAND with fine to coarse subangular to subrounded gravel		
					(1.15)			
					1.95	Complete at 1.95m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Site	Trial Pit Number
Great Ashby, Stevenage, Hertfordshire SG4 7EA	TP4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.70 m x 1.70 m x 1.85 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.80	D2				(0.75)	Firm to stiff orange-brown silty sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.10	D3				1.00	CHALK recovered as off-white silty clay with occasional weak low density chalk gravel		
					(0.85) 1.85	Complete at 1.85m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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GEA	Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Great Ashby, Stevenage, Hertfordshire SG4 7EA	Trial Pit Number **TP5**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.60 m x 2.10 m x 1.90 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
					(0.85) 1.10	Firm to stiff orange-brown silty sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
					(0.80) 1.90	CHALK recovered as off-white silty clay with occasional weak low density chalk gravel		
						Complete at 1.90m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
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Site
Great Ashby, Stevenage, Hertfordshire SG4 7EA

Trial Pit Number
TP6

Excavation Method
Tracked 8 Tonne Excavator

Dimensions
0.80 m x 2.10 m x 1.90 m

Ground Level (mOD)

Client
Picture Estates Limited

Job Number
J22372

Location

Dates
20/12/2022

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
						Firm becoming stiff light brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.20	D2				(1.65)			
1.60	D3				1.90	Complete at 1.90m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Site	Trial Pit Number
Great Ashby, Stevenage, Hertfordshire SG4 7EA	TP7

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.80 m x 2.00 m x 1.80 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				0.10	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.70	D2				(1.50)	Firm to stiff orange-brown silty sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.60	D3				1.60 (0.20) 1.80	CHALK recovered as off-white silty clay with occasional weak low density chalk gravel		
						Complete at 1.80m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
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Site
Great Ashby, Stevenage, Hertfordshire SG4 7EA

Trial Pit Number
TP8

Excavation Method
Tracked 8 Tonne Excavator

Dimensions
0.90 m x 3.00 m x 1.80 m

Ground Level (mOD)

Client
Picture Estates Limited

Job Number
J22372

Location

Dates
20/12/2022

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				(0.25) 0.25	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.90	D2				(1.55)	Firm becoming stiff light brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.80	D3				1.80	Complete at 1.80m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Site	Trial Pit Number
Great Ashby, Stevenage, Hertfordshire SG4 7EA	TP9

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Tracked 8 Tonne Excavator	0.60 m x 2.00 m x 1.90 m		Picture Estates Limited	J22372
	Location	**Dates** 20/12/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1				0.10	TOPSOIL (dark brown clayey sand with gravel and rootlets)		
0.90	D2				(1.80)	Stiff light brown mottled dark brown slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel		
1.80	D3				1.90	Complete at 1.90m		

Plan

Remarks

Sides of trial pit remained stable.
Groundwater not encountered.
Soakaway test carried out within trial pit.

Scale (approx)	Logged By	Figure No.
1:50	AT	J22372.TP7

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Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	1 / 4
Engineer			

Trial Pit No: TP1 **Soakage Test No: 1**

Dimensions (m): 0.90 x 2.80 x 2.50

Time (mins)	Depth to water (m)
0	2.00
1	2.00
2	2.00
3	2.00
4	2.00
5	2.00
10	2.00
15	2.00
20	2.00
25	2.00
30	2.00
45	1.99
60	1.99
120	1.98
150	1.98

Trial Pit No: TP2 **Soakage Test No: 1**

Dimensions (m): 0.90 x 3.00 x 1.80

Time (mins)	Depth to water (m)
0	0.56
2	0.57
4	0.57
10	0.57
19	0.58
28	0.58
80	0.58
190	0.58

Trial Pit No: TP3 **Soakage Test No: 1**

Dimensions (m): 0.70 x 2.30 x 1.95

Time (mins)	Depth to water (m)
0	0.76
1	0.76
9	0.76
18	0.78
28	0.79
39	0.80
61	0.83
141	0.87
216	0.92
303	0.95

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Engineer	

Job Number J22372

Sheet 2 / 4

Trial Pit No: TP4 **Soakage Test No: 1**

Dimensions (m): 0.90 x 3.00 x 1.80

Time (mins)	Depth to water (m)
0	0.96
6	1.02
17	1.03
102	1.75
111	1.76
131	1.77
145	1.82

Trial Pit No: TP4 **Soakage Test No: 2**

Dimensions (m): 0.70 x 1.70 x 1.82

Time (mins)	Depth to water (m)
0	0.38
1	0.40
2	0.44
7	0.51
17	0.57
27	0.70
68	0.95
120	1.23
150	1.40

Trial Pit No: TP4 **Soakage Test No: 3**

Dimensions (m): 0.70 x 1.70 x 1.82

Time (mins)	Depth to water (m)
0	0.50
1	0.53
3	0.55
7	0.59
17	0.67
32	0.81
47	0.91
62	1.02
77	1.14
92	1.25
107	1.37
122	1.48

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Engineer	

Job Number J22372

Sheet 3 / 4

Trial Pit No: 5 **Soakage Test No: 1**

Dimensions (m): 0.60 x 2.10 x 1.90

Time (mins)	Depth to water (m)
0	1.00
10	1.00
20	1.02
30	1.02
60	1.03
1260	1.41
1346	1.46
1350	1.46
1391	**1.46**
1425	1.47

Trial Pit No: 6 **Soakage Test No: 1**

Dimensions (m): 0.80 x 2.10 x 1.90

Time (mins)	Depth to water (m)
0	0.65
2	0.62
4	0.64
7	0.64
12	0.64
22	0.64
42	0.64
60	0.63
90	0.63
120	0.62
180	0.61

Trial Pit No: 7 **Soakage Test No: 1**

Dimensions (m): 0.80 x 2.00 x 1.80

Time (mins)	Depth to water (m)
0	1.00
10	0.98
25	1.00
33	1.02
36	1.04
84	1.08
177	1.15
213	1.18

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	4 / 4
Engineer			

Trial Pit No: 8 **Soakage Test No: 1**

Dimensions (m): 0.90 x 3.00 x 1.80

Time (mins)	Depth to water (m)
0	1.30
1	1.30
2	1.30
3	1.30
4	1.30
5	1.30
6	1.30
7	1.30
8	1.30
9	1.30
10	1.30
15	1.30
30	1.30
45	1.30
60	1.29
120	1.27

Trial Pit No: 9 **Soakage Test No: 1**

Dimensions (m): 0.60 x 2.00 x 1.90

Time (mins)	Depth to water (m)
0	1.00
10	1.00
20	1.00
30	1.00
60	1.00
120	1.00

Pit was left overnight and there was no change in level by 9am the following morning

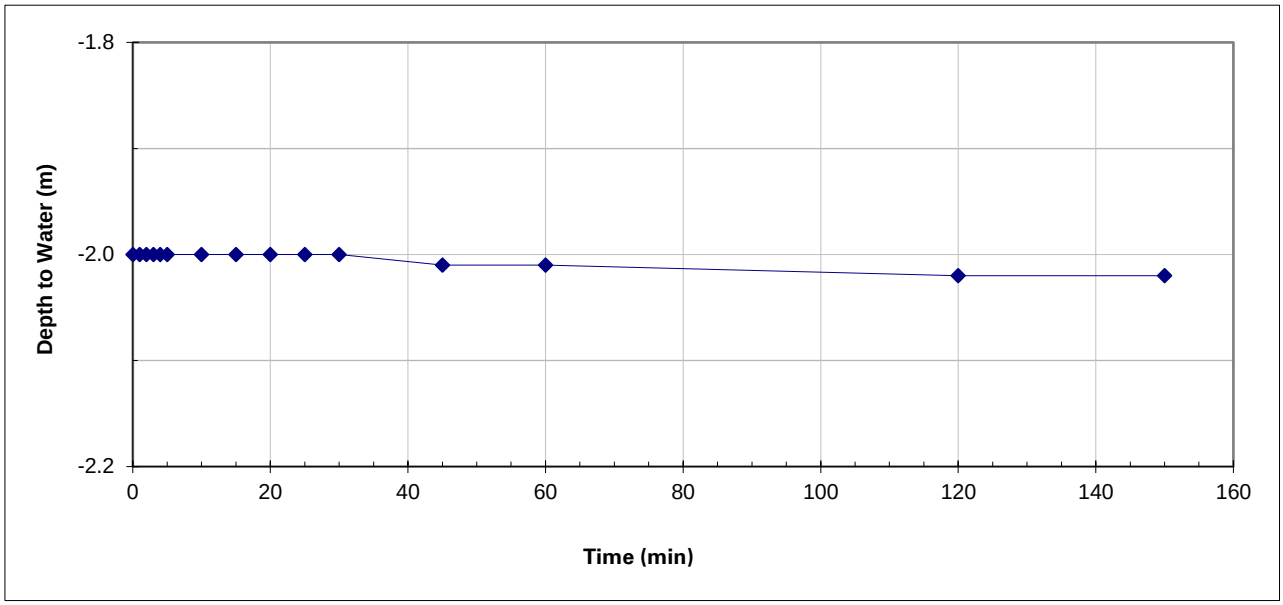
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Herts | 01727 824666 Notts | 01509 674888

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	1 / 6
Engineer			

Trial Pit No. TP1 Soakage Test No. 1

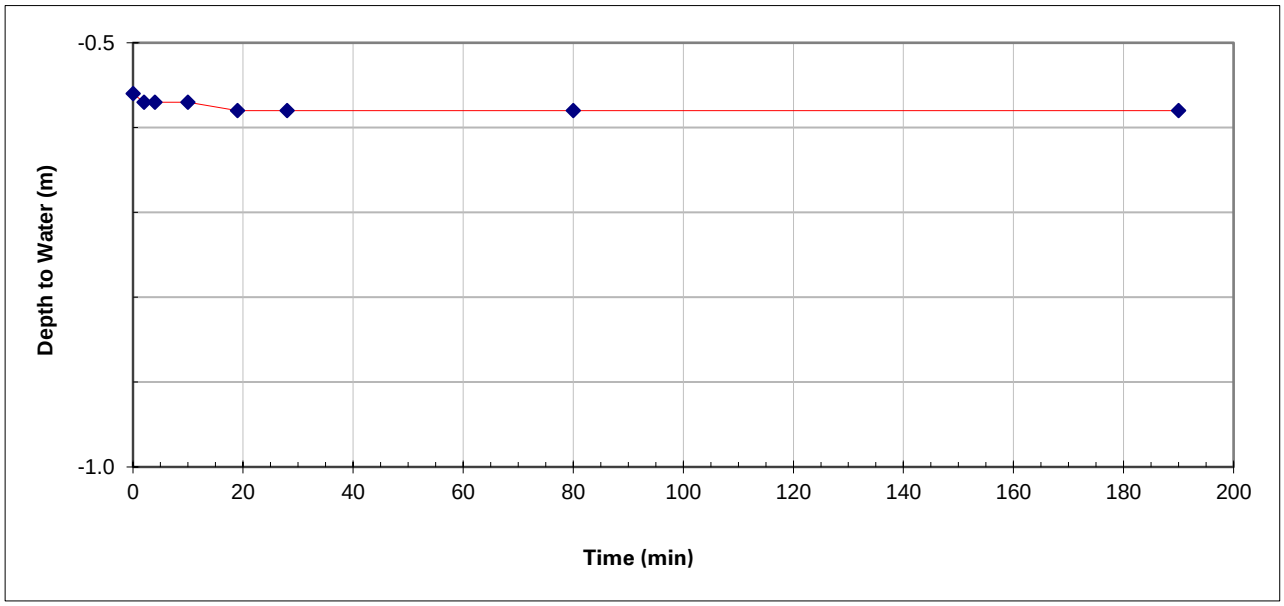
Pit Length (m) 2.8 Pit Width (m) 0.9 Pit Depth (m) 2.5



Design Soakage Rate 1.1E-06 m/s (based on linear portion of graph as shown)
0.10 m/day

Trial Pit No. TP2 Soakage Test No. 1

Pit Length (m) 3 Pit Width (m) 0.9 Pit Depth (m) 1.8



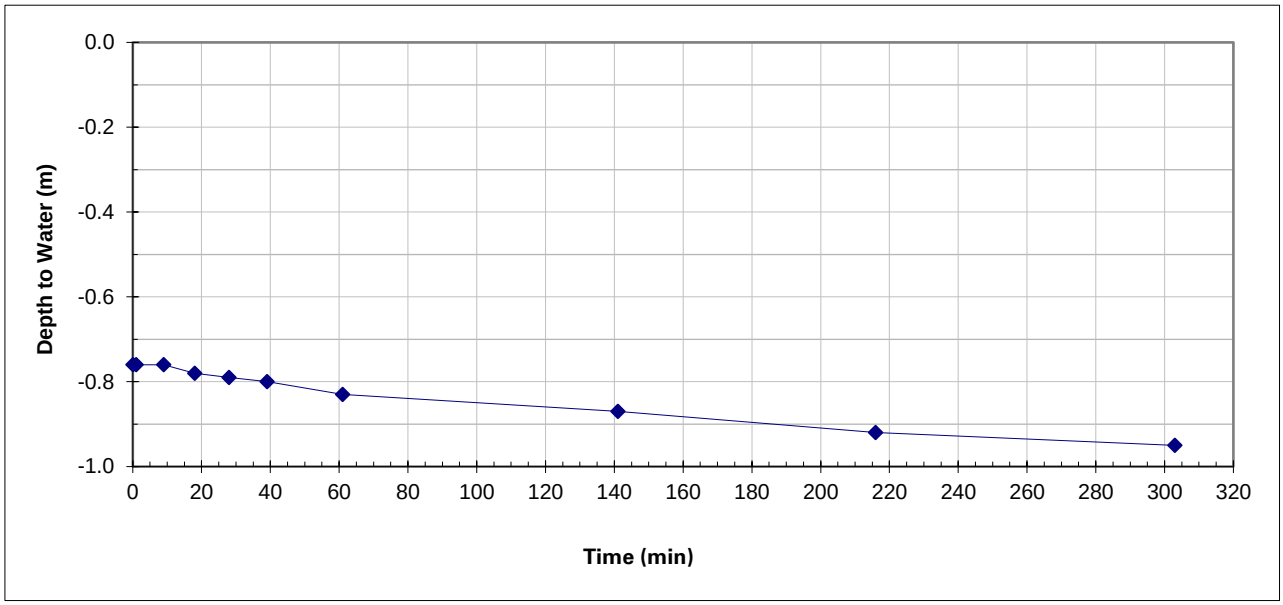
Design Soakage Rate 3.9E-07 m/s (based on linear portion of graph as shown)
0.03 m/day

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	2 / 6
Engineer			

Trial Pit No. TP3 Soakage Test No. 1

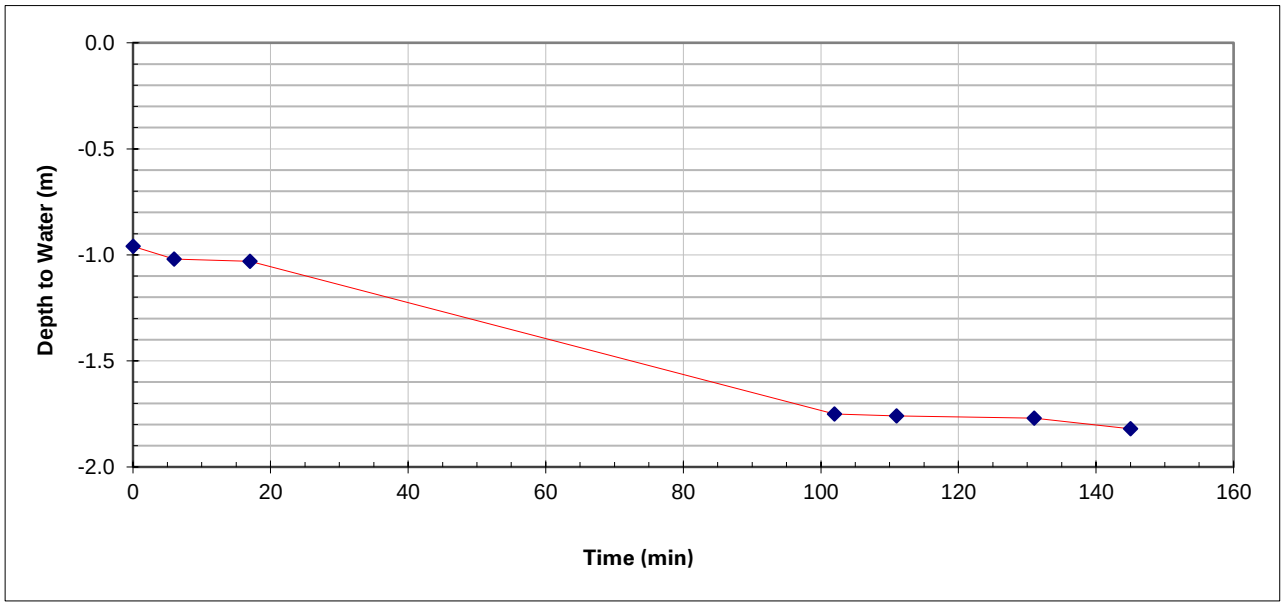
Pit Length (m) 2.3 Pit Width (m) 0.7 Pit Depth (m) 1.95



Design Soakage Rate 1.7E-06 m/s (based on linear portion of graph as shown)
0.14 m/day

Trial Pit No. TP4 Soakage Test No. 1

Pit Length (m) 3 Pit Width (m) 0.9 Pit Depth (m) 1.8



Design Soakage Rate 4.9E-05 m/s (based on linear portion of graph as shown)
4.27 m/day

Soakage Test Results

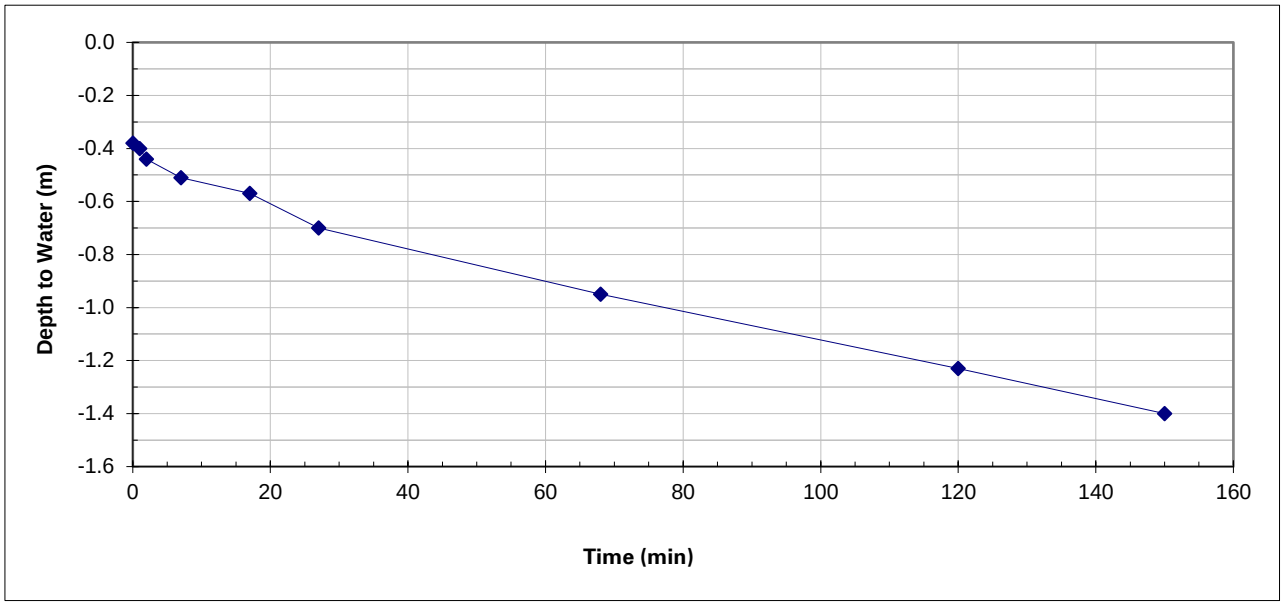
Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Engineer	

Job Number J22372

Sheet 3 / 6

Trial Pit No. TP4 Soakage Test No. 2

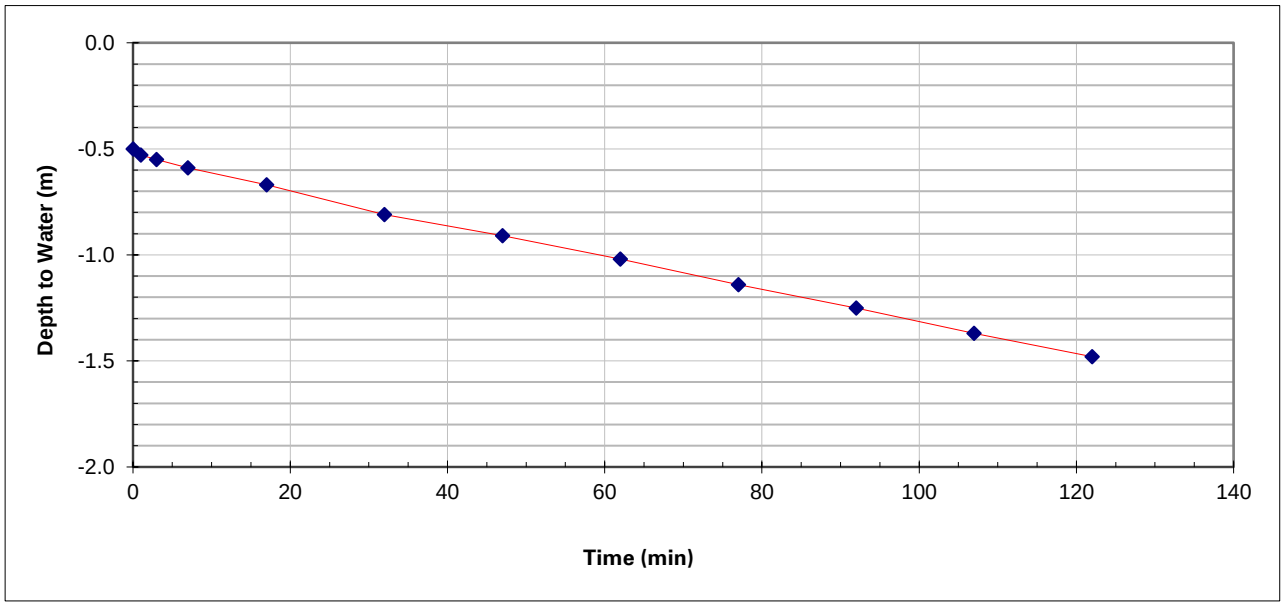
Pit Length (m) 1.7 Pit Width (m) 0.7 Pit Depth (m) 1.82



Design Soakage Rate 2.3E-05 m/s (based on linear portion of graph as shown)
2.00 m/day

Trial Pit No. TP4 Soakage Test No. 3

Pit Length (m) 1.7 Pit Width (m) 0.7 Pit Depth (m) 1.82



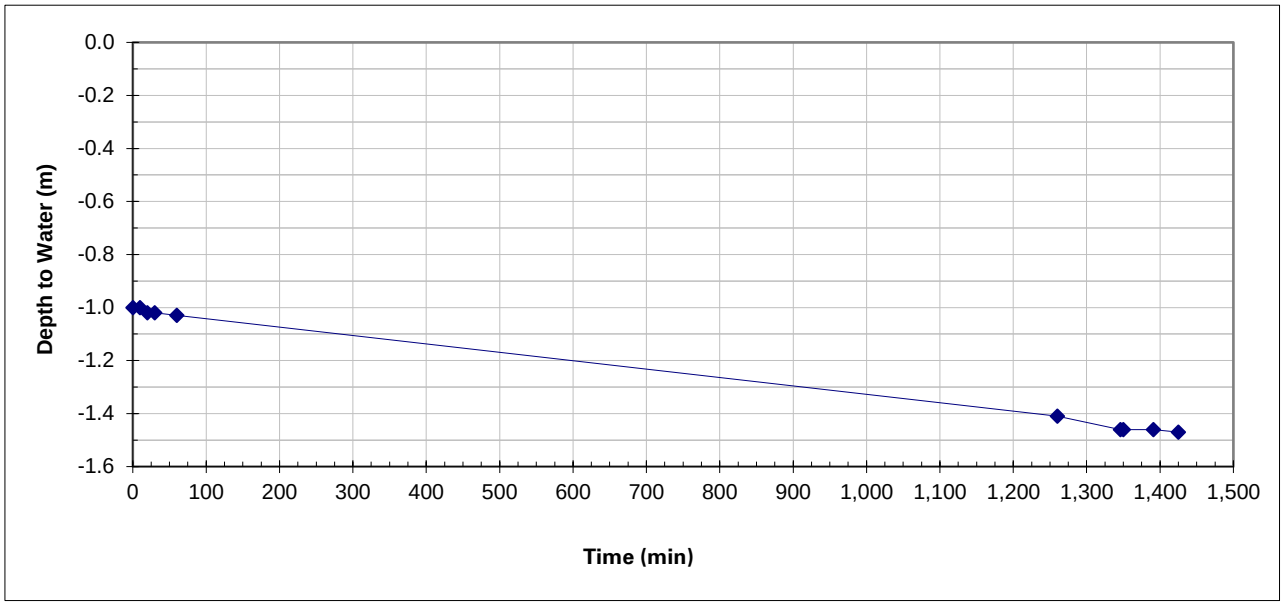
Design Soakage Rate 3.1E-05 m/s (based on linear portion of graph as shown)
2.67 m/day

Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	4 / 6
Engineer			

Trial Pit No. TP5 Soakage Test No. 1

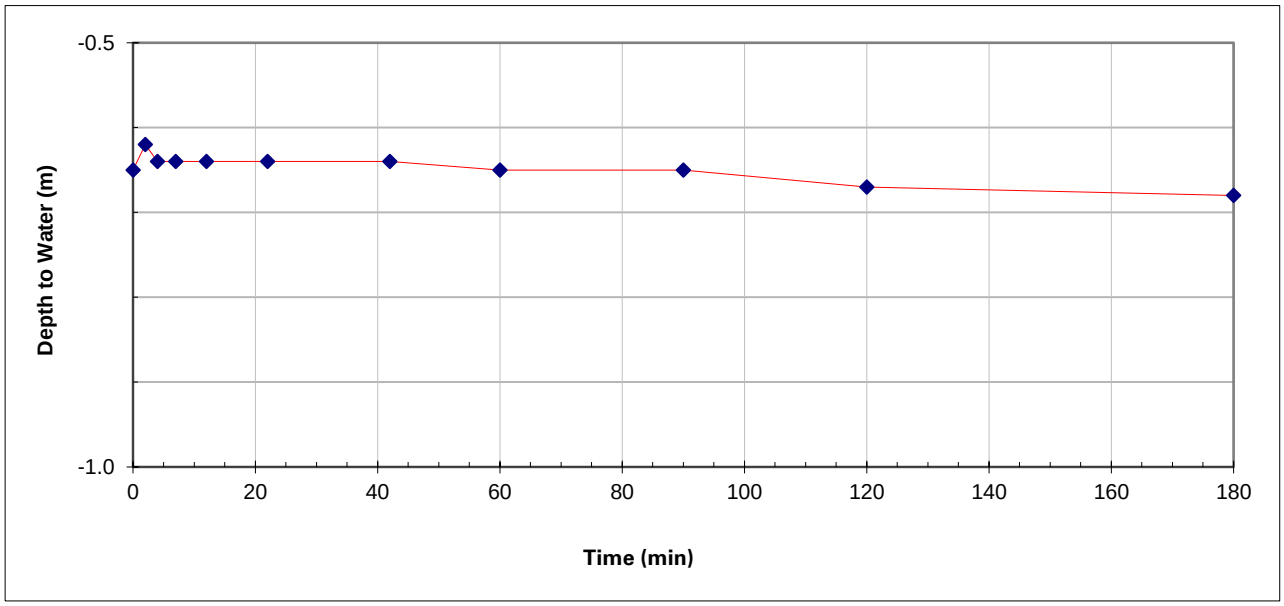
Pit Length (m) 2.1 Pit Width (m) 0.6 Pit Depth (m) 1.9



Design Soakage Rate 1.5E-06 m/s (based on linear portion of graph as shown)
0.13 m/day

Trial Pit No. TP6 Soakage Test No. 1

Pit Length (m) 2.1 Pit Width (m) 0.8 Pit Depth (m) 1.9



Design Soakage Rate 1.1E-06 m/s (based on linear portion of graph as shown)
0.09 m/day

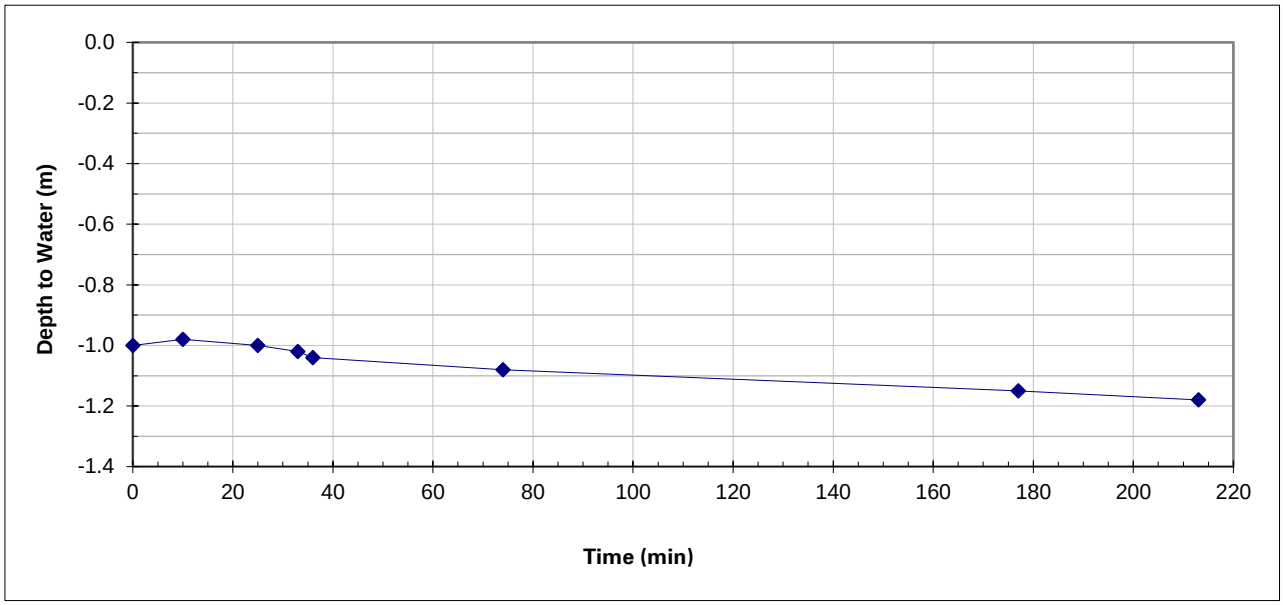
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Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	5 / 6
Engineer			

Trial Pit No. TP7 Soakage Test No. 1

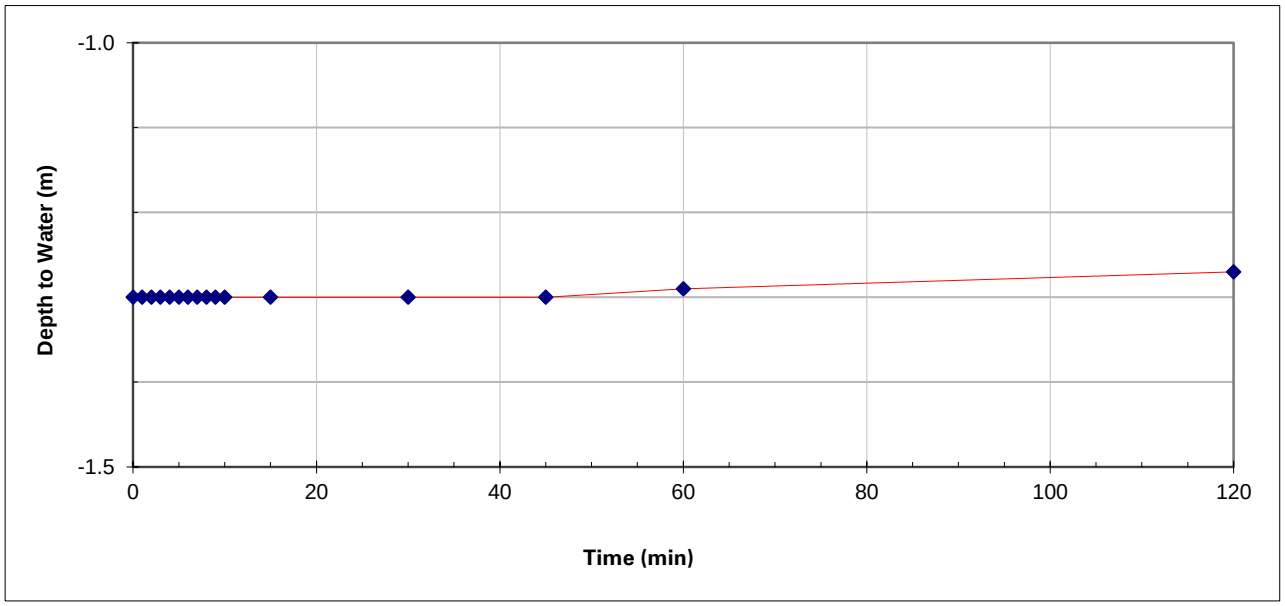
Pit Length (m) 2 Pit Width (m) 0.8 Pit Depth (m) 1.8



Design Soakage Rate 5.1E-06 m/s (based on linear portion of graph as shown)
0.44 m/day

Trial Pit No. TP8 Soakage Test No. 1

Pit Length (m) 3 Pit Width (m) 0.9 Pit Depth (m) 1.8



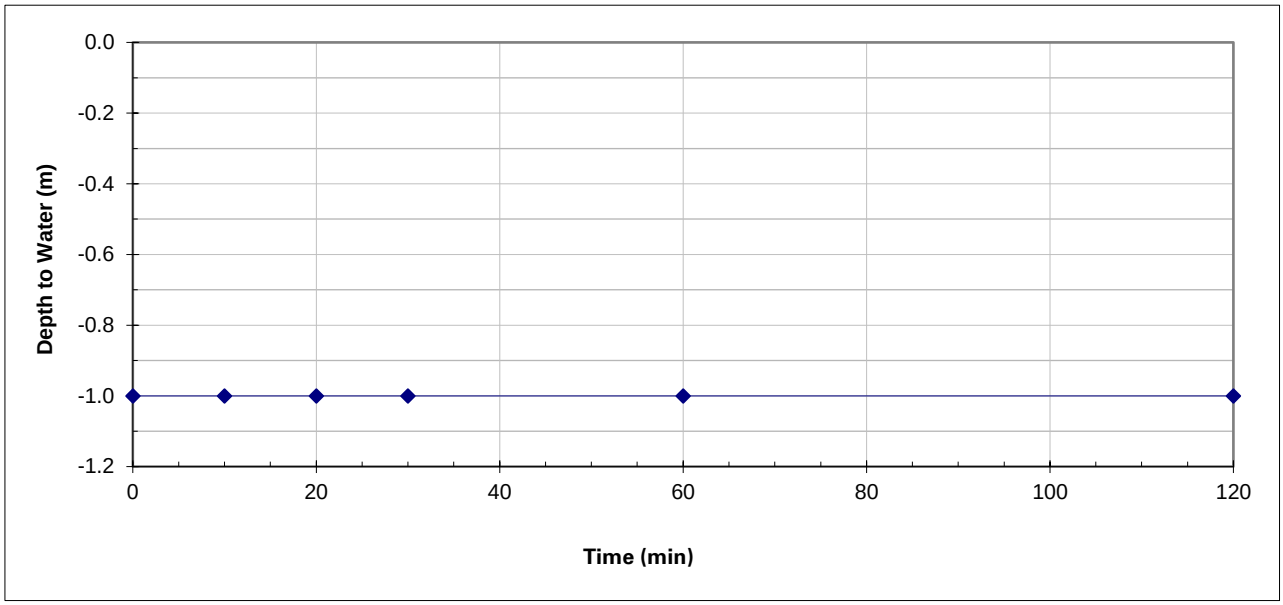
Design Soakage Rate -2.2E-06 m/s (based on linear portion of graph as shown)
-0.19 m/day

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Soakage Test Results

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	6 / 6
Engineer			

Trial Pit No.	TP9		Soakage Test No.	1	
Pit Length (m)	2	Pit Width (m)	0.6	Pit Depth (m)	1.9



Design Soakage Rate	0.0E+00	m/s	(based on linear portion of graph as shown)
	0.00	m/day	

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Geotechnical & Environmental Associates

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Borehole Soakage Test

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	1/2
Engineer			

Borehole No: 1 **Test No:** 1

Test Data

Before start of test:

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	5	10.00
5	11.5	3.50
10	12	3.00
15	12.15	2.85
30	12.38	2.62

Soakage Calculation

Borehole Diameter (m)		0.1500
Borehole Area (m)		0.0177
Borehole Perimeter (m)		0.471
From Plot:	D1 (m)	3.5
	D2 (m)	2.62
	T1 (min)	5
	T2 (min)	30
Soakage Volume (m^3)		0.016
Soakage Area (m^2)		1.46
Time (min)		25

Soakage rate (m/sec)	7.1025E-06
Soakage rate (m/day)	0.613656174

After completion of test

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Remarks:
Test carried out in the standpipe installed in the opendrive sampler borehole

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Borehole Soakage Test

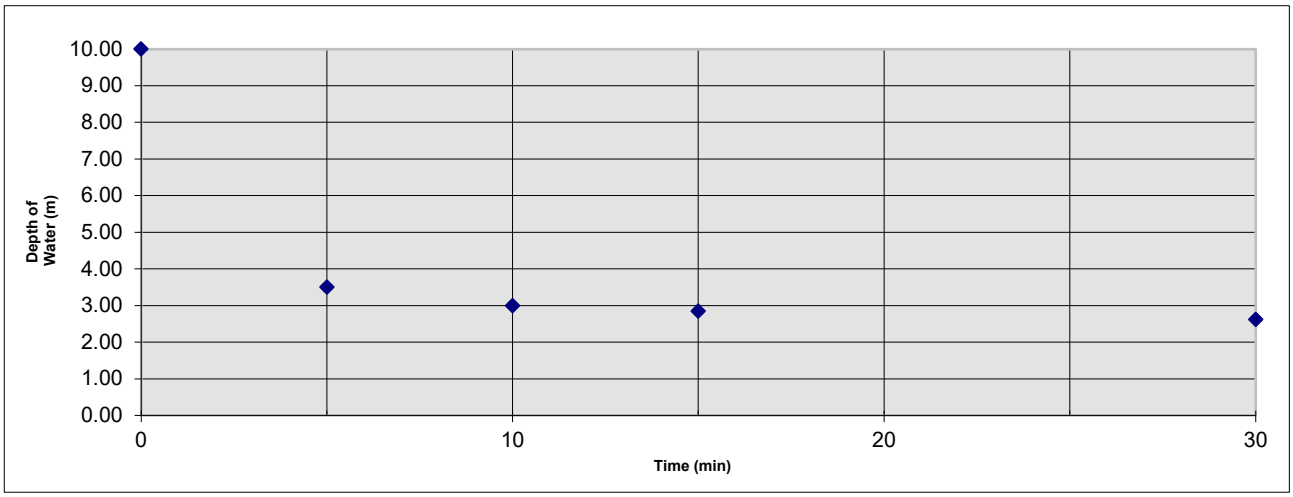
Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Engineer	

Job Number J22372

Sheet 2/2

Soakage Graph

Test No: 1



Remarks:

Test carried out in the standpipe installed in the opendrive sampler borehole

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Borehole Soakage Test

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	1/2
Engineer			

Borehole No: 2 **Test No:** 1

Test Data

Before start of test:

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	3.00	12.00
1	7.50	7.50
2	9.00	6.00
3	9.30	5.70
4	9.70	5.30
5	10.2	4.80
30	DRY	NA

Soakage Calculation

Borehole Diameter (m)	0.1500	
Borehole Area (m)	0.0177	
Borehole Perimeter (m)	0.471	
From Plot:	D1 (m)	7.5
	D2 (m)	4.8
	T1 (min)	1
	T2 (min)	5
Soakage Volume (m^3)	0.048	
Soakage Area (m^2)	2.92	
Time (min)	4	

Soakage rate (m/sec)	6.81818E-05
Soakage rate (m/day)	5.890909091

After completion of test

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Remarks:
Test carried out in the standpipe installed in the opendrive sampler borehole

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Borehole Soakage Test

Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA	**Job Number**	J22372
Client	Picture Estates Limited	**Sheet**	1/2
Engineer			

Borehole No: 3 **Test No:** 1

Test Data

Before start of test:

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	3.00	12.00
0.5	6.88	8.12
1	7.30	7.70
2	7.70	7.30
3	8.50	6.50
4	9.30	5.70
5	9.90	5.10
10	10.50	4.50

Soakage Calculation

Borehole Diameter (m)	0.1500	
Borehole Area (m)	0.0177	
Borehole Perimeter (m)	0.471	
From Plot:	D1 (m)	8.12
	D2 (m)	4.5
	T1 (min)	0.5
	T2 (min)	10
Soakage Volume (m^3)	0.064	
Soakage Area (m^2)	2.99	
Time (min)	10	

Soakage rate (m/sec)	3.752E-05
Soakage rate (m/day)	3.241723845

After completion of test

Borehole depth (m): 15.00
Standpipe depth (m): 15.00
Water level (m): DRY

Remarks:
Test carried out in the standpipe installed in the opendrive sampler borehole

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Borehole Soakage Test

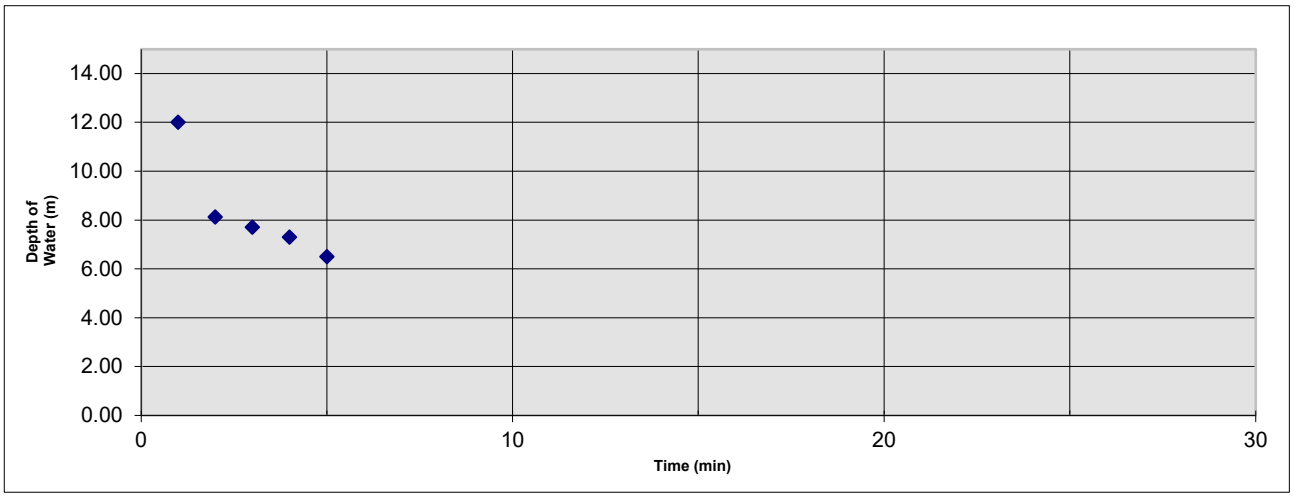
Site	Great Ashby, Stevenage, Hertfordshire SG4 7EA
Client	Picture Estates Limited
Engineer	

Job Number J22372

Sheet 2/2

Soakage Graph

Test No: 1



Remarks:

Test carried out in the standpipe installed in the opendrive sampler borehole

Appendix I

Thames Water Sewer Records

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Asset location search

Property Searches

Wormald Burrows Partnership
12AHitchin Street
BIGGLESWADE
SG18 8AX

Search address supplied Great Ashby
Stevenage

Your reference E3257

Our reference ALS/ALS Standard/2021_4516021

Search date 11 October 2021

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Great Ashby, Stevenage,

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TL2627SE
TL2627SW
TL2527SE
TL2527NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

The following quartiles have not been printed as they contain no assets:

TL2627NE
TL2528SE
TL2628NW
TL2627NW
TL2628SW

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TL2627NE	Affinity Water
TL2528SE	Affinity Water
TL2627SE	Affinity Water
TL2627SW	Affinity Water
TL2527SE	Affinity Water
TL2628NW	Affinity Water
TL2527NE	Affinity Water
TL2627NW	Affinity Water
TL2628SW	Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Asset location search

Property Searches

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

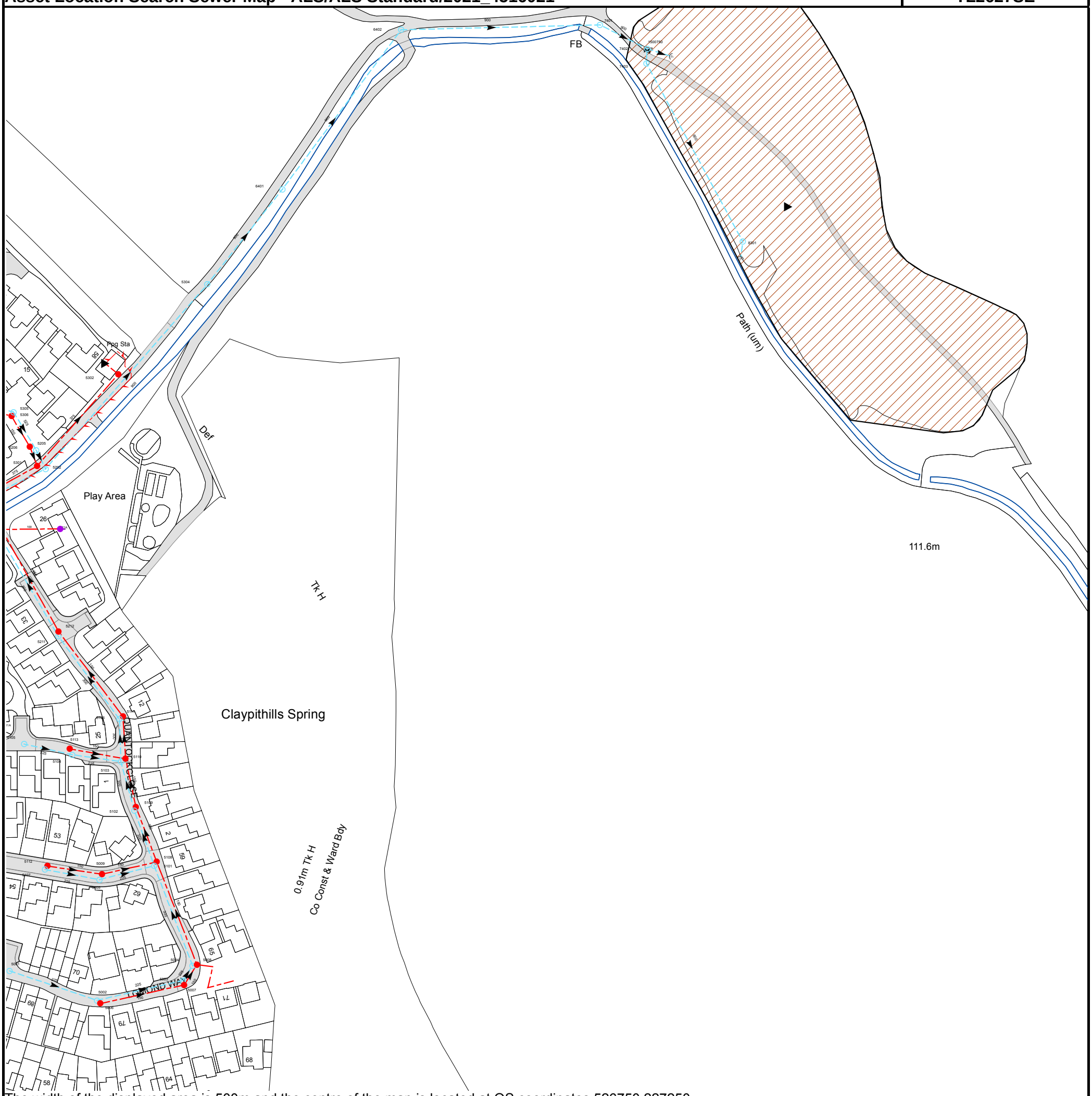
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4516021

TL2627SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526750,227250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

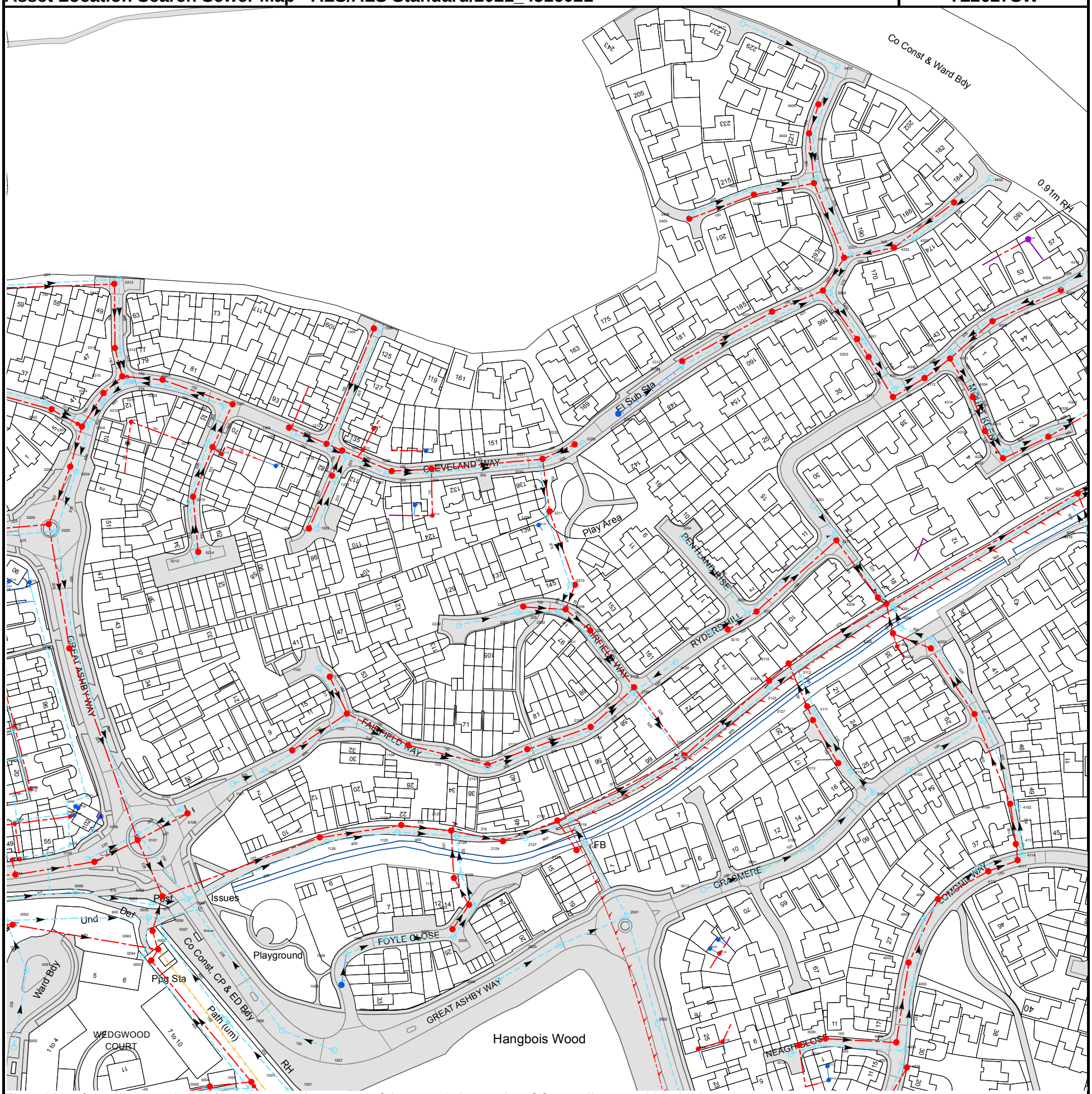
Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5306	119.53	117.23
5305	119.53	117.34
5206	118.83	116.68
5205	118.65	115.82
5301	118.67	114.3
5202	118.6	115.05
5212	124.15	121.83
521A	n/a	n/a
5302	117.95	113.5
5006	133.02	130.98
5002	133.03	131.39
5007	131.99	129.84
5003	131.98	130.31
5001	133.52	131.99
5004	132.05	130.22
5008	132.07	129.68
5005	132.36	130.68
5009	132.3	130.13
5107	132.56	130.95
5105	129.61	128.26
5112	132.53	130.45
5211	124.36	122.58
5113	130.1	127.61
5104	130.17	128.07
5106	128.93	127.21
5103	130.4	127.85
5111	128.83	126.77
5110	130.31	127.35
5102	131.53	129.34
5109	131.47	128.86
5101	132.07	129.79
5108	132.05	129.19
5304	116.2	113.52
6401	114	112.1
6402	113.2	11.32
7401	112.5	110.42
7403	111.75	110
7402	111.85	109.98
8301	110.4	109.52

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Asset Location Search Sewer Map - ALS/ALS Standard/2021_4516021	TL2627SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,227250

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,227250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4313	124.79	122.3
4305	124.72	121.57
4314	123.51	121.98
4304	123.61	121.37
4316	122.15	120.55
4303	122.09	120.04
4330	124.45	122.5
4308	124.49	122.49
4223	120.99	119.61
4220	121.03	119.18
4224	119.95	118.56
4301	119.88	118.13
4217	119.1	115.6
5201	119.24	114.91
4218	120.36	116.76
4326	119.57	117.48
4302	119.67	117.47
4216	119.55	116.4
4008	134.79	132.64
4007	134.88	133.05
4006	134.78	131.82
4003	134.77	131.39
4005	134.03	131.53
4002	133.9	130.64
4004	133.27	131.2
4001	132.8	130.28
4112	132.4	130.02
3109	129	125.42
421A	n/a	n/a
4103	128.67	127.17
4204	123.48	121
4203	123.15	119.35
4105	127.02	125.52
4115	132.4	130.88
4101	127.39	124.8
4104	131.2	129.4
4110	132.08	129.77
4111	132.28	129.86
4102	131.4	129.96
4113	132.35	130.39
4114	132.27	130.45
411A	n/a	n/a
3403	130.57	128.26
3408	130.55	128.58
3411	127.26	126.16
3407	129.94	127.66
3402	129.85	127.2
3404	128.56	125.12
3409	128.56	125.56
3401	128.88	124.83
3406	128.82	125.45
3405	128.18	125.34
3410	127.36	125.82
3313	129.19	124.56
3321	129.09	124.93
4332	128.6	124.87
4333	128.37	125.51
4401	127.84	125.31
4402	127.43	125.91
431A	n/a	n/a
4329	124.18	122.8
4309	124.22	122.64
4310	124.09	122.69
3318	130.37	128.54
3312	130.4	128.3
3204	127.11	125.59
3206	123.6	121.95
3210	123.66	122.12
3203	123.83	121.49
3211	123.78	121.9
3319	129.76	127.59
3311	129.78	126.6
3201	124.29	122.57
3305	129.37	124.48
3306	129.25	124.58
3202	123.26	121.14
3213	123.09	119.45
3302	127.66	124.17
3301	127.63	124.29
3303	127.14	124.03
3214	121.42	117.32
4221	121.29	118.5
4206	121.25	117.02
4205	123.3	118.09
4311	125.9	123.6
4201	121.1	117.72
4307	125.9	122.95
4202	122.5	118.53
4306	125.19	122.26
4312	125.2	122.8

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2122	125	122.44
2105	123.67	121.38
2102	123.64	121.68
2001	n/a	n/a
2103	124.16	121.45
2106	124.22	121.02
2002	129.88	127.82
3128	123.59	122
3101	122.98	119.9
3102	122.98	120.76
3013	128.38	126.88
301E	n/a	n/a
301F	n/a	n/a
301G	n/a	n/a
301B	n/a	n/a
3001	129.08	126.53
3124	122.48	119
3123	122.55	119.68
3115	n/a	n/a
3112	122.25	118.02
3127	n/a	n/a
3108	129.22	126.22
3114	125.27	121.7
3111	122.5	118.53
3009	134.2	131.71
3113	127.42	125.84
3110	128.2	124.97
1211	133.66	130.77
121C	n/a	n/a
131A	n/a	n/a
1305	133.98	131.93
1306	133.95	132.38
1221	133.12	130.45
1220	133.11	129.99
121B	n/a	n/a
121E	n/a	n/a
1222	132.73	130.16
1223	132.71	129.74
121A	n/a	n/a
2229	129.91	128.04
2203	128.21	126.16
2209	128.02	125.79
221A	n/a	n/a
2220	131.57	128.45
2221	131.59	128.1
2205	130.83	127.43
2211	130.93	127.11
2202	126.62	124.58
2208	126.55	124.21
2204	127.59	125.32
2222	131.36	128.34
2210	127.66	124.82
2223	131.33	128.73
2201	125.42	123.47
2207	125.47	123.14
2301	130.91	129.07
1102	129.02	126.24
1059	n/a	n/a
1106	129.07	125.96
1060	n/a	n/a
1125	124.85	122.28
1123	124.87	121.4
1104	127.06	124.97
1108	127.13	124.65
2125	124.45	121.19
2022	n/a	n/a
2005	n/a	n/a
1121	125.5	122.85
2128	124.5	122.1
2129	125.1	123.23
2023	n/a	n/a
2006	n/a	n/a
2101	124.52	122.61
2104	124.57	121.92
2004	129.16	127.6
2124	124.5	121.02
2127	124.12	121.75
2117	123.95	121.69
2116	123.89	121.93
2119	123.9	120.8
2003	127.7	126.17
2118	123.9	121.66
2123	125.2	121.27
301D	n/a	n/a
301C	n/a	n/a
3012	133.96	132.42
301A	n/a	n/a
3010	134	131.9
3011	134.29	132.17
0301	134.81	127.81
0304	134.79	129.46
0310	135.02	129.51
0314	135.1	127.97

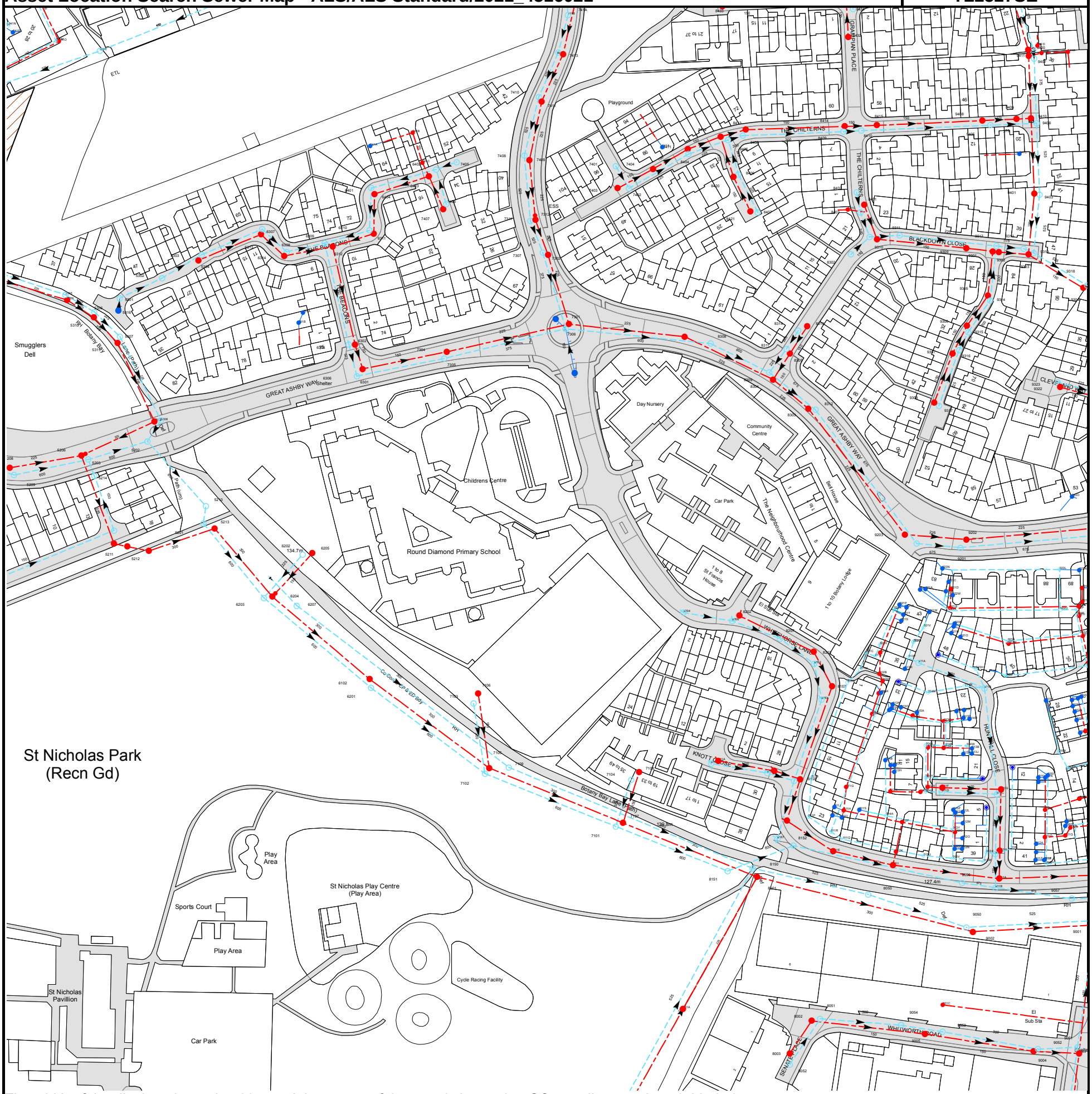
Manhole Reference	Manhole Cover Level	Manhole Invert Level
0311	135.42	129.57
031A	n/a	n/a
0324	135.53	130.69
0325	135.43	131.08
0212	134.5	131.85
0215	134.57	131.37
0213	133.71	132.12
0214	133.82	131.56
0210	134.63	131.62
0217	134.63	131.22
021G	n/a	n/a
1302	135.03	131.39
1301	134.98	131.1
121D	n/a	n/a
1304	134.26	132.33
1303	134.23	132.44
1201	133.38	130.7
1202	133.39	131.13
1212	133.89	131.14
1210	133.88	131.27
1232	133.49	130.5
1233	133.44	130.89
1213	133.72	130.31
011U	n/a	n/a
011Y	n/a	n/a
011T	n/a	n/a
0202	132.27	126.9
011W	n/a	n/a
011L	n/a	n/a
0201	132.41	128.55
011N	n/a	n/a
011K	n/a	n/a
0066	126.41	124.38
011M	n/a	n/a
011V	n/a	n/a
0102	128.2	126.6
011Z	n/a	n/a
0107	128.24	123.54
0106	128.93	123.27
0101	128.65	124.06
0062	127.75	122.68
0103	128.23	125.12
0108	128.27	123.65
1127	128.31	127.04
1101	128.55	126.63
1105	128.98	126.24
1103	130.33	128.11
1124	126.22	121.7
1126	126	122.59
1107	129.91	127.4
1051	n/a	n/a
1050	130.96	127.35
0058	130.97	127.57
011F	n/a	n/a
011I	n/a	n/a
011R	n/a	n/a
011D	n/a	n/a
011A	127.92	126.021
011J	n/a	n/a
011S	n/a	n/a
011E	n/a	n/a
011P	n/a	n/a
011Q	n/a	n/a
011G	n/a	n/a
011C	n/a	n/a
011H	n/a	n/a
011X	n/a	n/a
0004	n/a	n/a
1001	130.89	126.89
1057	129.68	128.25
0050	130.01	128.36
1056	129.17	127.58
1052	129.46	126.43
1058	n/a	n/a
0051	128.59	127.14
0001	n/a	n/a
0054	127.57	126.5
0002	127.9	125.93
0057	127.37	125.62
0063	126.3	124.81
0005	129.04	126.49
0052	129.12	126.1
0056	126.66	125.4
0055	126.67	125.43
0065	126.2	123.95
0064	127.5	123.3
011O	n/a	n/a
011B	n/a	n/a
021C	n/a	n/a
021A	n/a	n/a
021B	n/a	n/a
0303	135.42	133.72
0205	134.49	127.4

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0302	135.33	133.14
0203	134.5	128.94
0206	134.25	127.74
0204	134.37	129.29
0315	135.45	128.05
0312	135.53	129.69
0316	135.57	128.17
0317	135.68	128.47
0313	135.65	129.9

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Asset Location Search Sewer Map - ALS/ALS Standard/2021_4516021

TL2527SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525750,227250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
911N	n/a	n/a
916H	n/a	n/a
916I	n/a	n/a
915X	n/a	n/a
916D	n/a	n/a
911Q	n/a	n/a
916G	n/a	n/a
915W	n/a	n/a
911R	n/a	n/a
911T	n/a	n/a
911S	n/a	n/a
911L	n/a	n/a
912T	n/a	n/a
9003	130.29	127.89
9004	130.17	128.1
9052	130.21	127.72
9051	130.16	126.56
9001	129.09	126.59
9002	129.54	126.8
9050	128.85	126.88
9057	126.68	124.78
912N	n/a	n/a
9056	127.1	125.23
912O	n/a	n/a
912M	n/a	n/a
912L	n/a	n/a
913K	n/a	n/a
914W	n/a	n/a
913J	n/a	n/a
913B	n/a	n/a
913W	n/a	n/a
913X	n/a	n/a
901B	128.41	126.61
911E	128.553	126.993
911C	129.995	128.098
901A	128.39	126.29
911H	128.561	127.078
911G	130.175	128.725
916L	n/a	n/a
911Z	n/a	n/a
912A	n/a	n/a
911Y	n/a	n/a
911U	n/a	n/a
911W	n/a	n/a
911X	n/a	n/a
911P	n/a	n/a
911O	n/a	n/a
911M	n/a	n/a
915R	n/a	n/a
912P	n/a	n/a
912U	n/a	n/a
914O	n/a	n/a
913D	n/a	n/a
912S	n/a	n/a
913L	n/a	n/a
915V	n/a	n/a
915Y	n/a	n/a
912R	n/a	n/a
912Q	n/a	n/a
915S	n/a	n/a
911B	133.84	132.29
914N	n/a	n/a
915E	n/a	n/a
911K	n/a	n/a
915H	n/a	n/a
915G	n/a	n/a
911J	n/a	n/a
921M	n/a	n/a
923A	n/a	n/a
921O	n/a	n/a
921J	n/a	n/a
922Z	n/a	n/a
921L	n/a	n/a
923B	n/a	n/a
9201	136.02	132.59
9202	135.93	130.97
9323	136.25	134.4
923L	n/a	n/a
922O	n/a	n/a
9322	136.21	133.99
923O	n/a	n/a
922P	n/a	n/a
922R	n/a	n/a
921E	n/a	n/a
921K	n/a	n/a
921I	n/a	n/a
922N	n/a	n/a
921G	n/a	n/a
921F	n/a	n/a
021E	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
921H	n/a	n/a
9307	n/a	134.04
9316	136.47	134.44
9315	136.39	134.3
9306	136.35	133.88
9314	136.39	134.17
9305	136.41	133.74
9304	135.85	128.97
9318	135.77	130.13
9303	135.87	129.15
9319	135.82	130.52
9302	135.91	130.94
9301	136.97	132.7
9313	135.81	133.03
9309	136.16	133.01
9312	135.93	133.26
9310	136.62	133.59
8301	136.6	134.11
9311	136.38	133.98
8401	n/a	134.12
9403	135.79	n/a
9401	135.52	129.52
941C	n/a	n/a
8410	136.12	133.65
8415	135.82	134.33
9405	134.95	131.89
9406	134.61	130.96
9408	135	133.58
9409	n/a	n/a
9410	134.48	129.79
9407	133.4	131.08
9411	133.32	130.01
941B	n/a	n/a
941A	n/a	n/a
9419	133.275	130.036
9420	133.37	131.096
941D	n/a	n/a
913Z	n/a	n/a
811J	n/a	n/a
912W	n/a	n/a
911D	130.76	129
914Z	n/a	n/a
912X	n/a	n/a
911F	130.825	129.375
912V	n/a	n/a
811G	n/a	n/a
8166	131.27	129.35
8158	131.34	128.43
811O	n/a	n/a
914Y	n/a	n/a
913H	n/a	n/a
912Y	n/a	n/a
913G	n/a	n/a
914B	n/a	n/a
913A	n/a	n/a
912Z	n/a	n/a
914R	n/a	n/a
914X	n/a	n/a
914Q	n/a	n/a
913C	n/a	n/a
914S	n/a	n/a
913E	n/a	n/a
811U	n/a	n/a
811F	n/a	n/a
8003	131.06	129.9
9005	130.14	128.61
9053	130.25	128.28
9054	130.11	128.53
8002	130.37	129.41
8051	130.27	128.82
901C	n/a	n/a
8050	n/a	n/a
911I	128.91	127.06
913V	n/a	n/a
913U	n/a	n/a
912K	n/a	n/a
811E	129.36	127.37
912J	n/a	n/a
8152	128.76	126
811Q	n/a	n/a
912G	n/a	n/a
811R	n/a	n/a
913Y	n/a	n/a
912F	n/a	n/a
811I	n/a	n/a
811P	n/a	n/a
914A	n/a	n/a
811K	n/a	n/a
912I	n/a	n/a
811H	n/a	n/a
811S	n/a	n/a
915A	n/a	n/a
913M	n/a	n/a

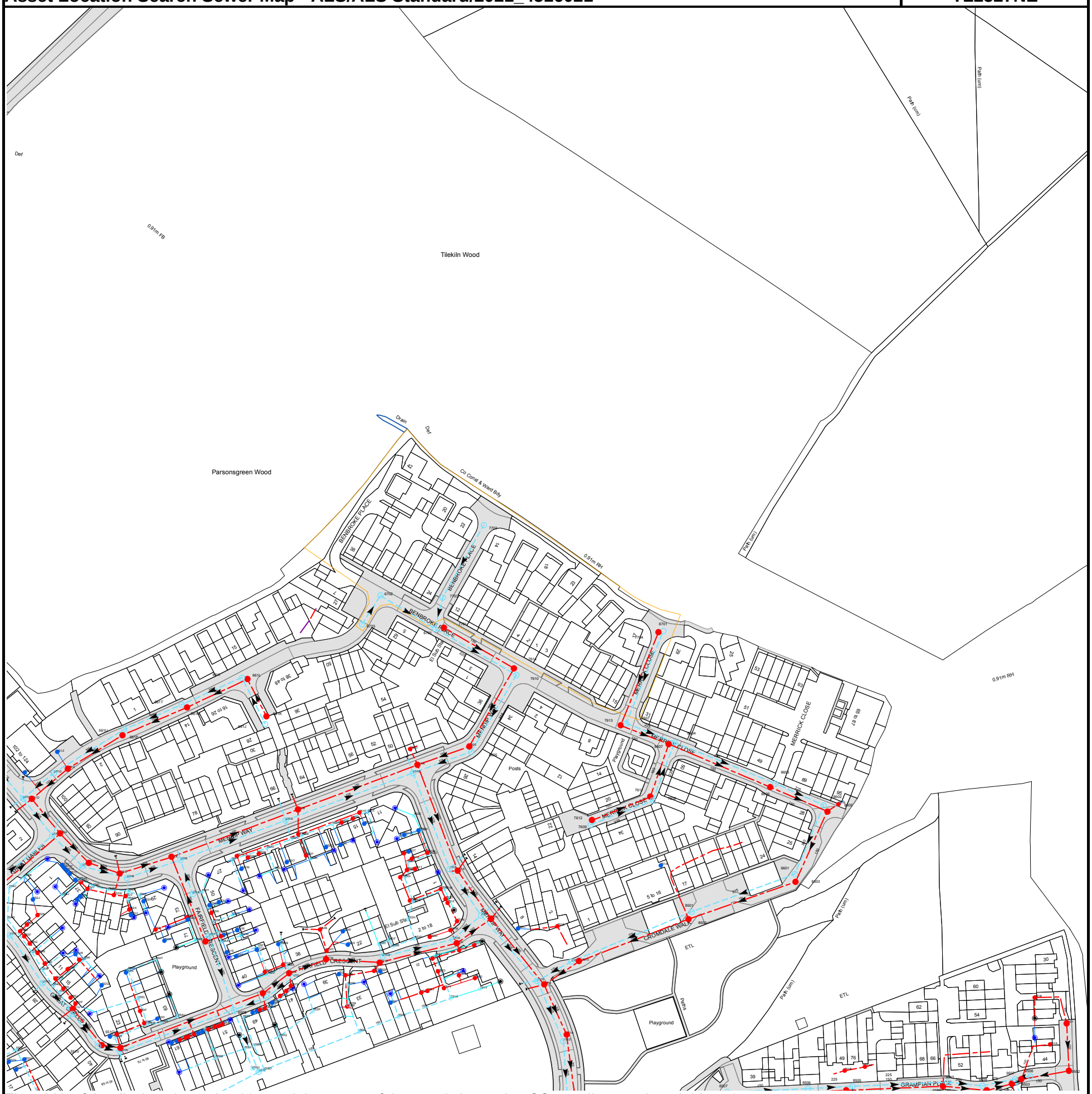
Manhole Reference	Manhole Cover Level	Manhole Invert Level
914T	n/a	n/a
913F	n/a	n/a
913O	n/a	n/a
913N	n/a	n/a
8164	133.82	131.52
912D	n/a	n/a
914K	n/a	n/a
914M	n/a	n/a
8157	134.06	130.36
811N	n/a	n/a
912C	n/a	n/a
912B	n/a	n/a
811M	n/a	n/a
913R	n/a	n/a
8162	133.82	131.52
911A	134.84	133.37
913P	n/a	n/a
811L	n/a	n/a
821C	n/a	n/a
921Q	n/a	n/a
8203	134.68	131.29
922H	n/a	n/a
921U	n/a	n/a
922G	n/a	n/a
8207	136.22	132.55
8204	136.93	134.33
8206	135.68	133.54
8202	135.64	131.98
8304	137.06	131.06
8303	136.79	130.9
8312	136.8	133.01
922A	n/a	n/a
921P	n/a	n/a
921S	n/a	n/a
921T	n/a	n/a
9203	136.23	130.48
921R	n/a	n/a
9204	133.22	132.69
922K	n/a	n/a
921V	n/a	n/a
921A	n/a	n/a
921W	n/a	n/a
9308	n/a	134.22
9317	136.49	134.74
923N	n/a	n/a
922U	n/a	n/a
921C	n/a	n/a
922L	n/a	n/a
921B	n/a	n/a
921D	n/a	n/a
921N	n/a	n/a
922W	n/a	n/a
7309	n/a	n/a
8309	137.15	133.1
8305	137	132.65
8311	136.99	133.49
8308	137.46	133.32
8307	137.61	131.41
8314	137.03	134.45
7306	137.86	133.59
8313	137.01	134.04
7301	137.9	131.76
7310	n/a	n/a
7302	137.92	132.07
8302	136.64	135.29
7307	137.9	134.02
7311	138.12	134.11
7312	138.04	133.07
8403	136.24	134.61
8407	n/a	135.54
8421	137.24	135.61
841C	n/a	n/a
8402	136.31	134.7
7402	137.74	135.58
7403	137.85	n/a
8420	137.42	135.47
8406	137.37	n/a
7404	137.65	136.13
7401	137.87	135.93
541N	140.6	139.95
541P	n/a	n/a
541M	140.47	139.82
541O	140.47	139.82
541C	140.187	137.927
7409	138.31	135.06
7408	138.37	135.68
8404	137.34	135.01
8411	137.31	135.72
841A	n/a	n/a
8405	137.02	134.48
8412	137.01	135.28
8408	136.91	134.36
8409	136.13	133.78

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8413	136.82	135.18
8414	136.04	134.5
7411	138.24	135.24
7410	138.21	135.82
7413	138.05	135.48
7412	138.02	135.97
8432	134.433	132.802
741B	137.956	136.026
8434	134.319	132.791
8433	136.008	133.754
741A	137.905	135.61
641A	n/a	n/a
641B	n/a	n/a
641C	n/a	n/a
6402	139.11	137.43
7405	139.02	137.6
5202	136.7	132
5312	136.68	135.26
5308	136.72	134.93
6306	137.58	134.42
6301	137.65	133.93
7305	137.86	134.2
7304	137.91	133.57
6302	137.83	134.02
6305	137.91	134.53
631B	n/a	n/a
631A	n/a	n/a
5302	138.73	137.02
5304	138.92	136.68
6314	138.89	136.35
5303	138.97	136.85
6308	138.93	136.58
6312	139.12	136.16
6309	139.14	136.46
6313	139.06	136.48
6311	138.98	136.66
6310	138.99	137.06
6307	139.28	136.67
7407	138.91	137.41
7406	138.92	137.57
6404	138.96	136.8
6401	138.99	137.21
6403	139.09	136.99
5203	136.48	132.3
5206	136.49	131.48
5311	136.9	135.48
5307	137	135.21
5310	137.3	135.82
5306	137.38	135.58
5316	n/a	n/a
5309	137.75	135.91
5301	138.4	137.17
5305	137.76	135.64
7105	132.32	128.9
7103	133.85	129.7
7106	133.85	130.1
6201	133.82	129.7
6102	133.82	129.4
6207	n/a	132.28
6203	133.9	130.78
6204	133.9	129.8
6202	135.8	133
6205	135.8	132.6
5212	134.38	130.5
5211	134.4	130.54
5207	134.96	130.51
5216	134.67	133.17
5213	134.38	130.25
5210	134.9	131.3
5201	135.06	131.4
5214	136.7	132.72
5209	136.32	132.56
5208	136.25	131.77
7109	n/a	130.69
7101	131.25	128
7107	131.25	128.2
7104	131.75	128.5
7108	131.75	128.75
801A	n/a	n/a
811B	131.91	129.759
811A	131.93	129.434
8151	129.79	126.5
8150	n/a	n/a
8001	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4516021

TL2527NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525750,227750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9505	133.193	130.714
9506	133.561	130.984
9509	133.242	131.225
9504	132.966	130.214
9510	133.534	131.4
9503	132.903	130.313
9507	132.959	131.175
9508	132.821	131.355
9502	132.633	130.464
851A	n/a	n/a
951A	n/a	n/a
9501	132.754	130.612
951B	n/a	n/a
7703	n/a	n/a
6702	n/a	n/a
7702	n/a	n/a
662K	n/a	141.9
662M	n/a	142
561A	n/a	139.945
661N	n/a	141.85
662P	n/a	142
662N	n/a	142
662D	n/a	141.4
662Q	n/a	142
662L	n/a	142.05
662C	n/a	n/a
662B	n/a	141.2
661O	n/a	n/a
662A	n/a	141.4
661Q	n/a	141.9
662R	n/a	142.1
661D	142.407	140.137
662S	n/a	142.1
661P	n/a	141.45
661Z	n/a	141.85
661B	142.414	139.509
661J	142.898	141.85
661K	142.857	141.69
561R	142.989	141.182
561T	143.003	141.65
661L	143.279	141.491
661I	143.251	141.762
6703	n/a	n/a
554M	n/a	141.35
552V	n/a	141.3
554C	n/a	141.675
554L	n/a	141.85
552U	n/a	141.4
552T	n/a	141.5
554K	n/a	141.7
551B	142.558	140.388
554B	n/a	141.8
561Y	n/a	141.9
561B	142.602	140.092
561X	n/a	142
561W	n/a	142.1
561F	142.787	140.622
561V	n/a	142.2
561C	142.806	n/a
561G	143.085	140.815
5604	143.034	140.369
561D	n/a	n/a
561H	143.329	141.229
561Q	143.413	141.45
562A	n/a	n/a
561S	143.434	140.642
561Z	n/a	n/a
561P	143.188	140.882
561U	143.209	141.546
652F	n/a	140.3
661S	n/a	140.8
661U	n/a	141.2
653I	n/a	140.5
661R	n/a	140.4
662H	n/a	140.7
662T	n/a	n/a
662I	n/a	140.6
652E	n/a	139.85
662U	n/a	n/a
661X	n/a	140.7
653G	n/a	140.05
661C	n/a	139.973
662E	n/a	141.4
661T	n/a	n/a
661A	142.36	138.695
661V	n/a	141
662F	n/a	141
661W	n/a	140.8
662G	n/a	140.85
6701	143.14	141.53

Manhole Reference	Manhole Cover Level	Manhole Invert Level
751P	n/a	139.7
7701	143.1	141.1
751W	n/a	140.3
751O	n/a	139.65
751Z	n/a	139.525
761B	141.157	138.977
761A	141.128	138.378
6606	142.066	139.261
6605	142	140.15
751F	140.535	138.565
751C	140.455	137.825
7614	142.4	140.2
7610	142.36	140.68
7609	140.49	138.78
7612	140.45	138.35
7613	141.1	139
7607	141.05	139.46
7611	140.46	138.15
7608	140.25	138.59
7704	n/a	n/a
861A	n/a	n/a
8701	n/a	n/a
8607	140.44	137.98
8604	140.45	138.42
8502	138.25	136.46
8501	138.35	136.69
8606	139.26	137.2
8603	139.25	137.55
8601	138.05	136.85
8503	137.95	136.81
8602	138.66	137.3
8605	138.61	137.03
861B	n/a	n/a
554O	n/a	141.75
554N	n/a	141.3
552X	n/a	141.9
552Y	n/a	142
554P	n/a	141.6
553H	n/a	141.9
553I	n/a	141.25
554T	n/a	n/a
553K	n/a	141.35
561E	142.506	140.301
553J	n/a	140.8
554Q	n/a	141.2
551X	142.07	140.77
554R	n/a	140.75
554Y	n/a	140.925
551R	141.7	140.59
554Z	n/a	141.3
551T	141.7	140
553M	n/a	141.1
553N	n/a	141
555B	n/a	140.85
555C	n/a	140.55
553L	n/a	141.5
553O	n/a	140.75
555A	n/a	140.8
653Y	n/a	141.1
651S	n/a	141.1
751B	138.975	135.905
751E	139.105	136.335
751U	n/a	139.6
752A	n/a	139.8
652G	n/a	138.975
652P	n/a	n/a
652O	n/a	n/a
651M	140.58	138.44
7509	139.03	136.52
7510	139	136.06
652H	n/a	138.825
651Q	140.55	139.11
653J	n/a	139.5
751R	n/a	138.65
653E	n/a	139.5
751S	n/a	139.8
653C	n/a	139.3
751L	140.28	138.21
653F	n/a	139.4
751K	140.3	138.89
653D	n/a	139.7
652D	n/a	139.8
751M	n/a	139.275
752C	n/a	n/a
752B	n/a	n/a
751N	n/a	139.525
653H	n/a	139.85
554G	n/a	140.45
552Q	n/a	140.7
551O	141.65	140.06
552O	n/a	140.25
553G	n/a	140.15
554F	n/a	140.75

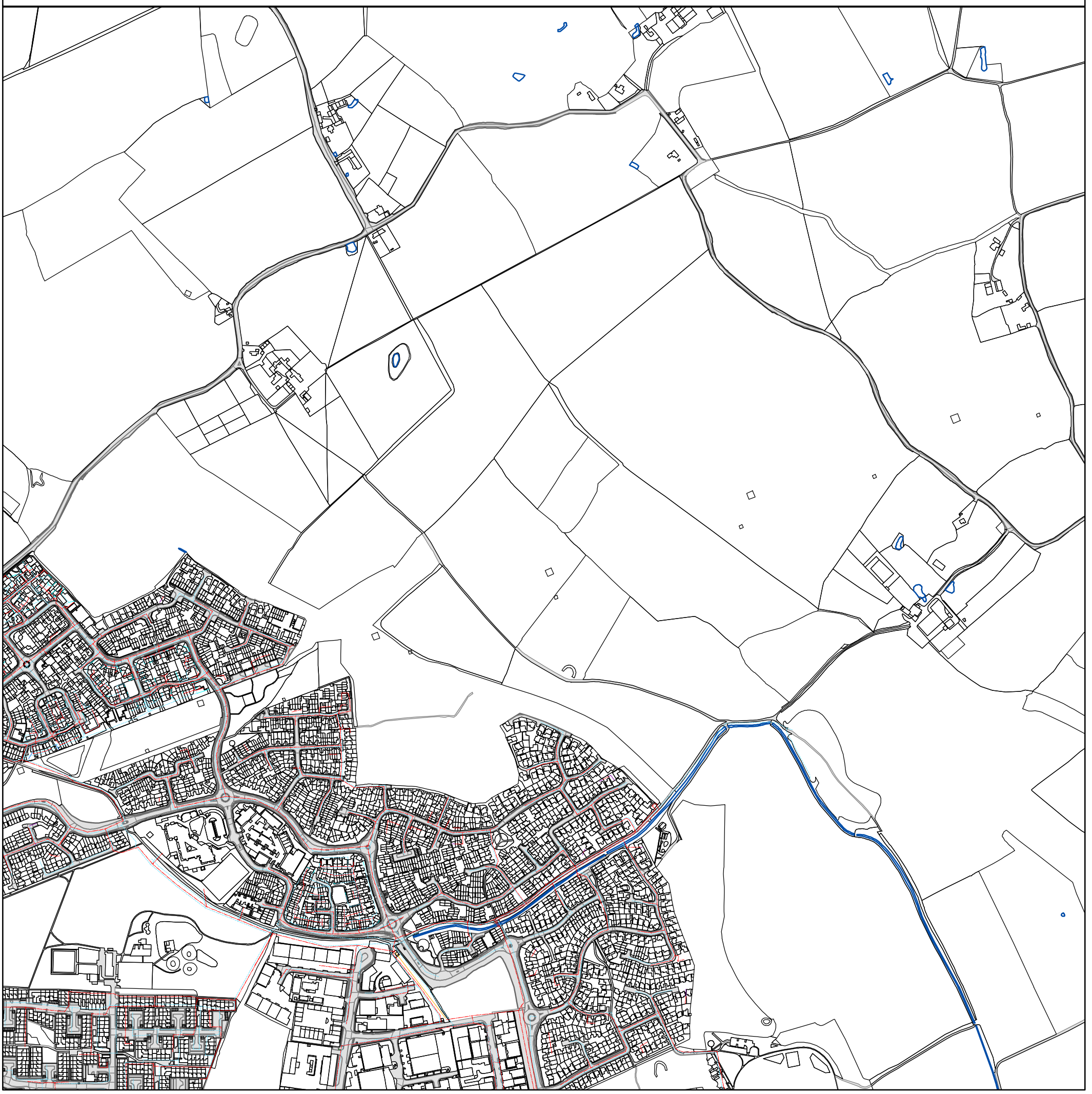
Manhole Reference	Manhole Cover Level	Manhole Invert Level
554S	n/a	140.15
555K	n/a	140.4
555H	n/a	140.8
552S	n/a	140.5
554I	n/a	140.75
552R	n/a	141.2
554E	n/a	140.8
552N	n/a	140.6
555G	n/a	n/a
555F	n/a	140.825
551Y	142.05	140.5
552M	n/a	140.9
552L	n/a	141
554D	n/a	141.3
552K	n/a	141.1
552J	n/a	142
553A	n/a	n/a
555M	n/a	141.9
552Z	n/a	141.75
554J	n/a	141.9
552W	n/a	141.1
661Y	n/a	141.85
652X	n/a	140.95
651T	n/a	n/a
651R	n/a	141.2
652W	n/a	140.95
661M	n/a	n/a
651U	n/a	140.65
652Y	n/a	140.8
651V	n/a	140.4
652Z	n/a	140.6
662J	n/a	141.95
651X	n/a	140.2
653B	n/a	140.4
651W	n/a	139.7
662O	n/a	142
653A	n/a	139.85
651K	141	138.73
652S	n/a	139.8
651L	140.98	139.54
652B	n/a	n/a
651N	140.83	138.61
652C	n/a	n/a
652L	n/a	n/a
653W	n/a	139.9
652N	n/a	n/a
653M	n/a	139.85
653X	n/a	140.2
553F	n/a	139.9
553E	n/a	139.8
554W	n/a	140.15
553D	n/a	140.8
554V	n/a	n/a
553P	n/a	140.5
553Q	n/a	140.4
554U	n/a	140.5
553R	n/a	140.375
553S	n/a	140.3
553T	n/a	140.25
553U	n/a	140
553V	n/a	140.5
553W	n/a	140.45
555D	n/a	140.25
553X	n/a	140.4
553Y	n/a	140.3
555E	n/a	140.05
553Z	n/a	140.25
554A	n/a	139.95
6508	141.18	139.25
653T	n/a	140.2
653V	n/a	139.8
653U	n/a	139.5
652U	n/a	140.8
653R	n/a	139.45
654A	n/a	140.6
552G	n/a	n/a
552I	n/a	n/a
552F	141.2	140.34
552H	141.05	140.28
554H	n/a	140.3
555I	n/a	140.15
555J	n/a	140.05
551S	141.45	139.85
551U	141.45	139.56
552P	n/a	139.9
551V	141.25	139.72
551Q	141.25	139.35
553C	n/a	140.05
554X	n/a	140.05
553B	n/a	139.55
551W	141.15	139.29
551P	141.15	139.29
555L	n/a	140.3

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8507	135.955	134.2
8504	134.398	132.313
8506	134.719	133.001
8505	134.354	132.652
851B	n/a	n/a
751D	138.156	136.206
751A	138.165	135.755
651J	140.2	138.06
654B	n/a	140.5
651O	141.15	138.83
653O	n/a	138.35
652V	n/a	140.5
651P	141.13	139.44
653S	n/a	140.4
652Q	n/a	141
653Q	n/a	139.7
652R	n/a	140.9
654C	n/a	140.2
653P	n/a	139.9
652M	n/a	n/a
653N	n/a	139.7
653L	n/a	138.55
652I	n/a	139.7
653K	n/a	138.875
653Z	n/a	139.5
652J	n/a	139.4
751V	n/a	138.95
751X	n/a	139.05
751Y	n/a	139.3

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4516021



0 45 90 180 270 360
Meters

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

Scale:	1:7161
Width:	2000m
Printed By:	Rveldhur
Print Date:	11/10/2021
Map Centre:	526346,227811
Grid Reference:	TL2627NW

Comments:

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0800 009 4540.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Appendix J

Thames Water Sewer Flooding Enquiry

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Jemma Davies

From: EIR Requests <EIR.Requests@thameswater.co.uk>
Sent: 17 May 2023 15:35
To: Jemma Davies
Subject: RE: Sewer Flooding History Enquiry - Great Ashby, Stevenage (19244)

Follow Up Flag: Follow up
Flag Status: Flagged

Thames Water Utilities Limited
EIR Requests
Clearwater Court
Vastern Road
Reading
Berkshire
RG1 8DB

Email: EIR.Requests@thameswater.co.uk

17 May 2023

Our Ref: EIR-23-24-053

Environmental Information Regulation (EIR) Request

Dear Mr Jemma

Thank you for your e-mail dated 25 April 2023. Please see our response below to your request as set out in your e-mail.

Your Request

We are interested in the sewer flooding history at a site in named 'Mendip Way, Great Ashby' in Stevenage. Please see below the closest address to the site.

The closest address to the site is: **Grampian Place, Great Ashby, North Hertfordshire, Hertfordshire, England, SG1 6DR.**

The National Grid Reference for the site is: **TL 25958 27647.**

Other postcodes in the area that require checking are: SG1 6GR, SG1 6GU, SG1 6BH, SG1 6BX.

A Site Location Plan (with the site boundary marked in red) is also attached to this email for your reference.

I would be grateful if you could confirm whether there has been any sewer flooding incidents in the vicinity of the site in the last 20 years (2003 – 2023).

Our Response

From our records, there have been no flooding incidents recorded on either Property or non-property SFHD (Sewer Flooding History Database) for any of the postcodes listed in your request from 1st January 2003 to 2023.

Disclaimer

The information provided with this letter is taken from the information we hold on our records as at the date indicated. We cannot guarantee the accuracy of this information and it should not be relied on for any purpose.

Retention
Please note that we will also retain a record of your request to allow us to evidence our compliance with the law relating to EIR.

Charging
Although in accordance with our published charging regime, we are able to charge fees/costs for dealing with requests under EIR, on this occasion, we have chosen not to do so. We reserve the right to charge in accordance with the fees published on our website for any requests, now or in the future.

For more information about our interim charges scheme please click here (please note that you will need to use an up to date web browser and that the web pages will not support access by an older browser, such as Internet Explorer).

Should you have any questions, please don't hesitate to contact me.

Internal Review
If you are dissatisfied with the handling of your request, you have the right to ask for an internal review. Internal review requests should be submitted within three months of the date of receipt of this response and should be addressed to the Environmental Information Requests Manager and emailed to EIR.Requests@thameswater.co.uk

If you are dissatisfied with the outcome of the internal review, you can apply, without charge, to the Information Commissioner, who will consider whether Thames Water has complied with its obligations under the EIR and can require Thames Water to remedy any problems. You can find out more about how to do this, and about the EIR in general, on the Information Commissioner's website at: www.ico.org.uk.

Yours sincerely

Paul

Paul Bridgens
Data Protection Advisor
Data Protection Investigations

From: Jemma Davies <j.davies@woodshardwick.com>
Sent: 25 April 2023 09:19
To: EIR Requests <EIR.Requests@thameswater.co.uk>
Subject: Sewer Flooding History Enquiry - Great Ashby, Stevenage (19244)

Good Morning,

We are interested in the sewer flooding history at a site in named 'Mendip Way, Great Ashby' in Stevenage. Please see below the closest address to the site.

The closest address to the site is: **Grampian Place, Great Ashby, North Hertfordshire, Hertfordshire, England, SG1 6DR.**
The National Grid Reference for the site is: **TL 25958 27647.**

Other postcodes in the area that require checking are: SG1 6GR, SG1 6GU, SG1 6BH, SG1 6BX.

A Site Location Plan (with the site boundary marked in red) is also attached to this email for your reference.

I would be grateful if you could confirm whether there has been any sewer flooding incidents in the vicinity of the site in the last 20 years (2003 – 2023).

Many thanks,

Regards,
For & on behalf of Woods Hardwick Ltd

Jemma Davies
Graduate Transport Planner



BEDFORD OFFICE
15-17 Goldington Road
Bedford
MK40 3NH

T: 01234 268862
W: woodshardwick.com

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Appendix K

Proposed Drainage Strategy, Typical Details and Outfall Photographs

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Architecture | Engineering | Planning | Surveying



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5. The exact location and level of all existing sewers, drains and services are to be confirmed on site prior to the commencement of any works.

SAFETY, HEALTH AND ENVIRONMENTAL

There are no exceptional risks associated with these works. Refer to the Designers Risk Assessment for the full assessment of risks.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

KEY

- Site boundary
- Proposed surface water sewer
- Proposed surface water headwall
- Proposed ditch [Type A] Min. 1.0m deep / 1:3 slopes / 1.0m bed width (cross-sectional area = 7.0m²)
- Proposed foul water sewer
- Proposed foul water rising main
- Existing woodland
- Proposed foul water pumping station
- Existing foul water sewer
- Ancient Woodland 15m offset
- Existing Flood Route Path
- Proposed Flood Route Path
- Phase 1
- Phase 2
- Phase 3

REV	DESCRIPTION	DRN	CHD	DATE
J	UPDATED TO SUIT LATEST FLOW CALCULATIONS	RD	EML	24.10.2025
I	NOTE 2 ADDED TO ADDRESS LLFA COMMENTS RECEIVED 21.07.25	EML	MDF	19.09.2025
H	UPDATED TO ADDRESS LLFA COMMENTS RECEIVED 21.07.25	EML	MDF	19.09.2025
G	DRAINAGE DESIGN UPDATED TO SUIT MASTERPLAN 'REV K' AND LATEST ROAD ACCESS LAYOUT	EML	MDF	01.04.2025
F	DRAINAGE DESIGN UPDATED TO SUIT MASTERPLAN 'REV K'	EML	MDF	21.03.2025
E	DRAINAGE DESIGN UPDATED TO SUIT MASTERPLAN 'REV D' & SITE BOUNDARY RECEIVED 19.07.2024	EML	MDF	19.07.2024
D	LOOP ROAD AND ACCESS ROAD RE-DESIGNED. DRAINAGE STRATEGY UPDATED TO MATCH LATEST ROAD LAYOUT	EML	MDF	22.02.2024
C	UPDATED TO LATEST LAYOUT RECEIVED 14.09.23	EML	MDF	21.09.2023
B	DRAINAGE STRATEGY UPDATED TO LATEST STRATEGY LAYOUT	EML	MDF	06.07.2023
A	DRAINAGE STRATEGY UPDATED TO LATEST STRATEGY LAYOUT	EML	MDF	25.04.2023

☒ PRELIMINARY ☐ INFORMATION ☐ TENDER
☐ CONSTRUCTION ☐ AS BUILT

SCALE	1:1250 @ A0	DATE	MARCH 2023
DRAWN	EML	CHK	MDF
DRAWING NO.	19244_ASHB-5-SK001	REV	J

TITLE: LAND NORTH EAST OF GREAT ASHBY STEVENAGE

DETAILS: DRAINAGE STRATEGY

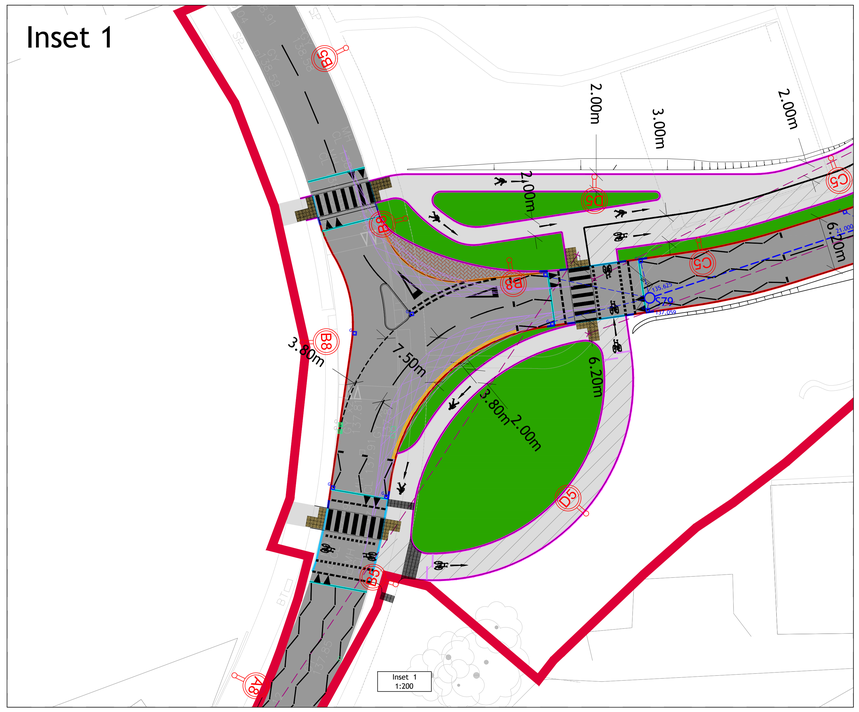
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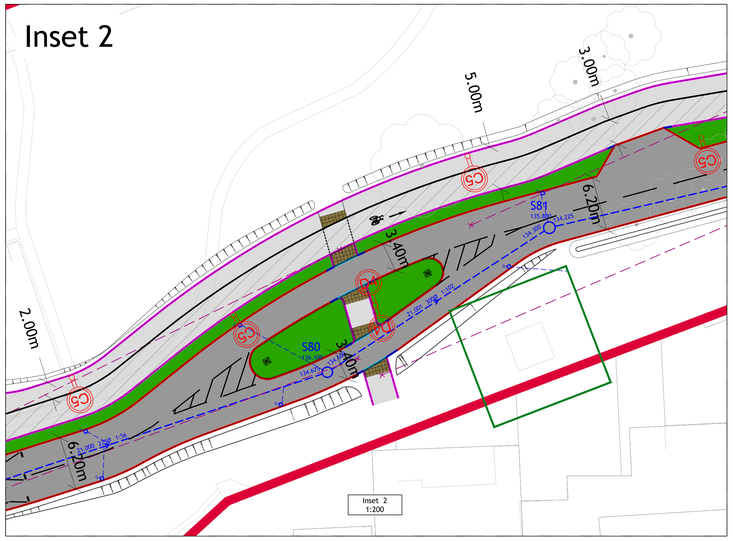
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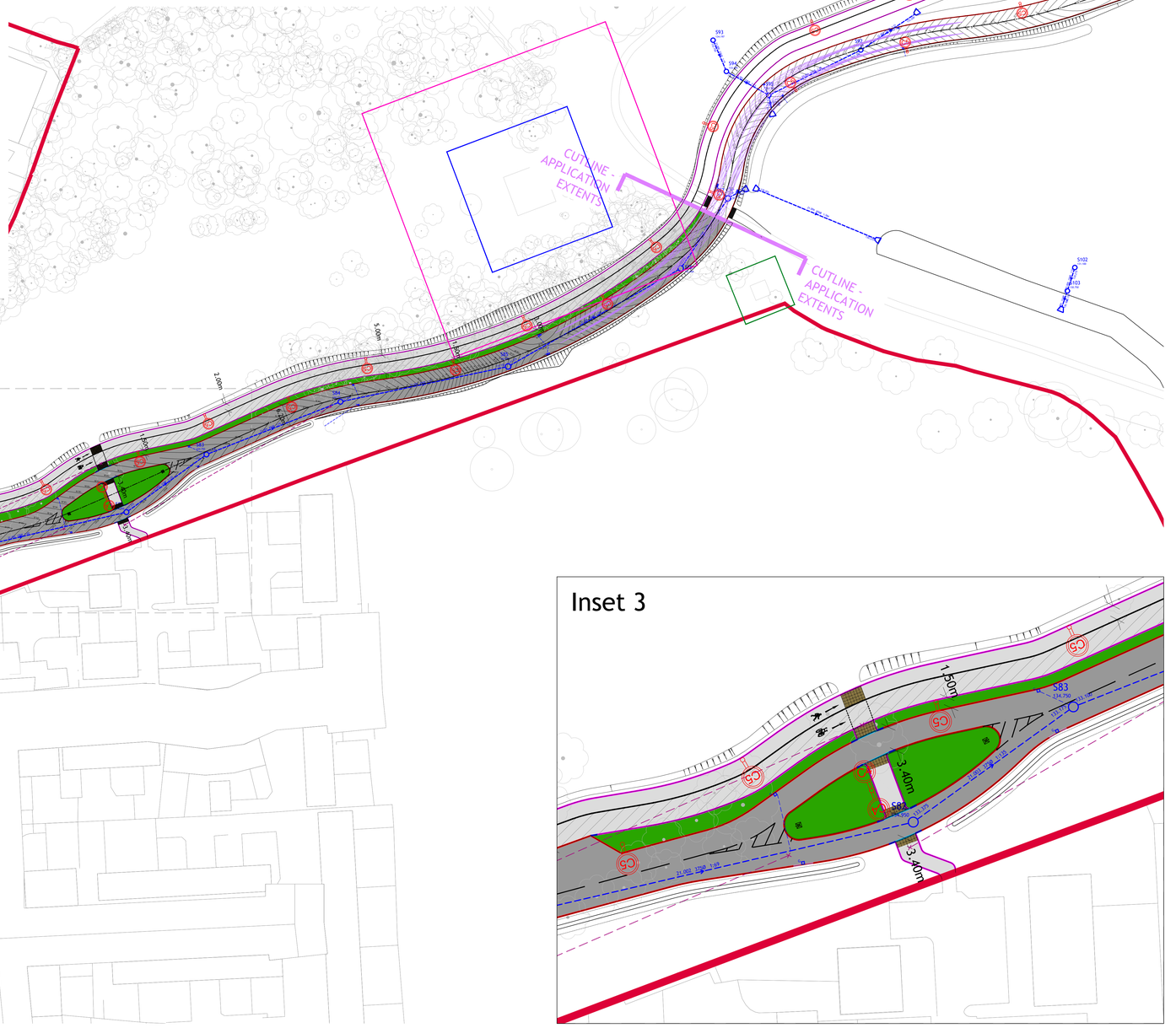
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0 5 10 15 25 50 75
SCALE 1:500

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SAFETY, HEALTH AND ENVIRONMENTAL

There are no exceptional risks associated with these works. Refer to the Designers Risk Assessment for the full assessment of risks.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

KEY

- Site Boundary
- 20mph forward visibility splay
- Pedestrian crossing forward visibility splay (in accordance with LTN 2/95)
- Swale and Batters
- Fixed Cycleway Barriers
- Keep Left Bollard
- Adoptable Surface Water Network
- Proposed Gully
- Existing Gully To Be Relocated
- Proposed Swales
- Adoptable asphalt carriageway
- Adoptable blockwork raised table / shared surface
- Adoptable blockwork shared surface/over-run
- Adoptable asphalt footway
- Adoptable cycleway
- Landscaping
- Adoptable Swale
- Adoptable street lighting columns (A-D, Q-R) Refer to Julian Lighting Solution drawings for specification (REV P03)
- National Grid 12m tower stand off zone required for access and maintenance
- National Grid 30m tower stand off zone, where advised any conductive material within this zone be adequately earthed
- UKPN 5m stand off zone required for access and maintenance (tbc)

REV	DESCRIPTION	DRN	CHD	DATE
D	SWALES AMENDED TO SUIT HIGHWAYS COMMENTS	SH	MDF	17.10.2025
C	UPDATED TO SUIT LATEST HIGHWAYS COMMENTS AND RSA	SH	MDF	09.10.2025
B	UPDATED IN ACCORDANCE WITH RSA1 DESIGNERS RESPONSE	WT	MDF	13.09.2025
A	MEANS OF ACCESS LAYOUT UPDATED	WT	MDF	21.03.2025

■ PRELIMINARY ☐ INFORMATION ☐ TENDER
☐ CONSTRUCTION ☐ AS BUILT

SCALE	1:500 @ A0	DATE	JULY 2023
DRAWN	BDS	CHK	MDF
DRAWING NO.	19244-ASHB-5-SK005	REV	D
TITLE	LAND NORTH EAST OF GREAT ASHBY STEVENAGE		
DETAILS	MEANS OF ACCESS		

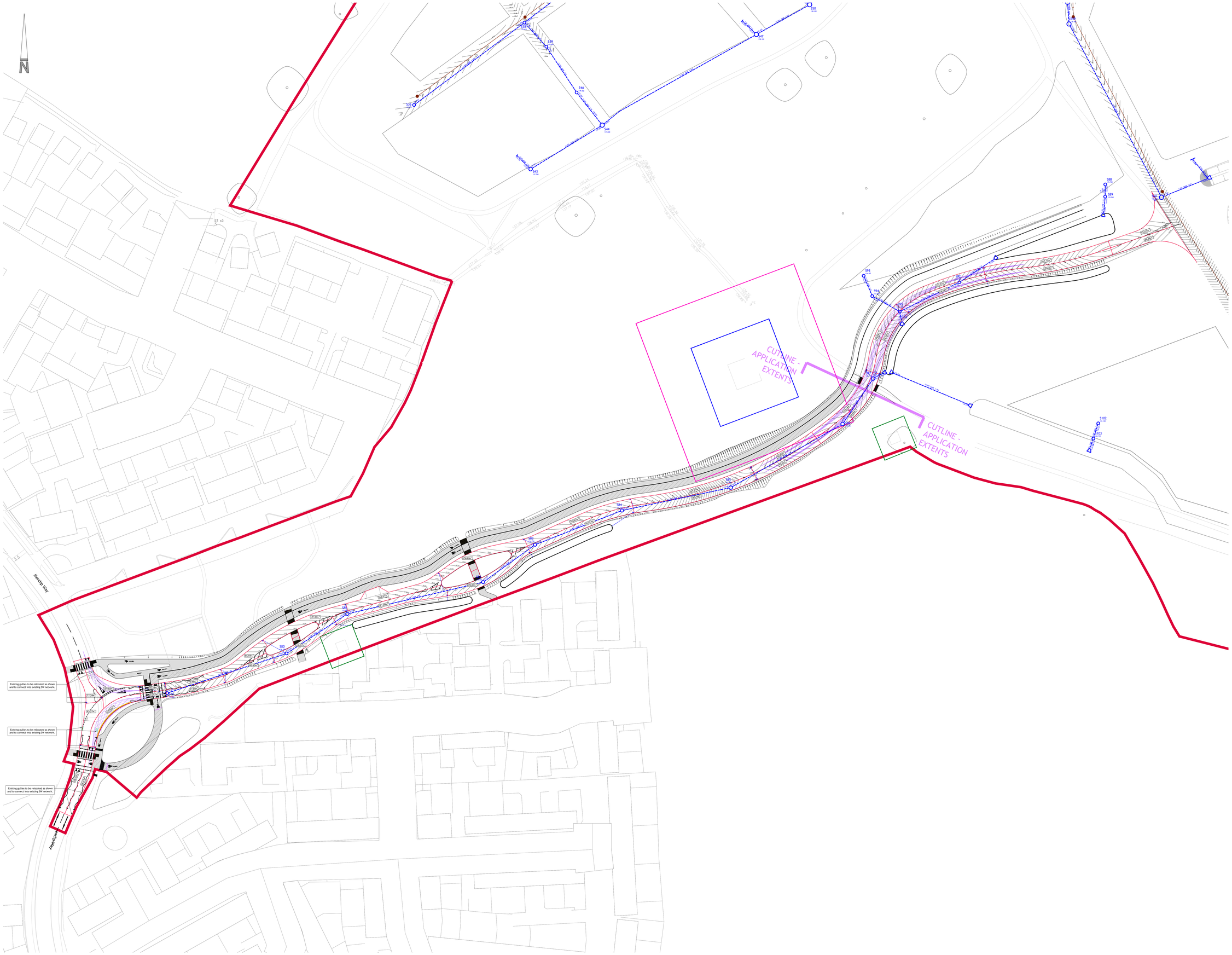
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It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

KEY

- Site Boundary
- Adoptable Surface Water Network
- Proposed Gully Catchment
- Proposed Gully
- Existing Gully To Be Relocated
- Proposed Swales

REV	DESCRIPTION	DRN	CHD	DATE

■ PRELIMINARY ☐ INFORMATION ☐ TENDER
☐ CONSTRUCTION ☐ AS BUILT

SCALE	1:500 @ A0	DATE	OCTOBER 2025
DRAWN	SH	CHK	MDF
DRAWING NO.	19244-ASHB-5-SK014	REV	
TITLE	LAND NORTH EAST OF GREAT ASHBY STEVENAGE		
DETAILS	GULLY CATCHMENT PLAN		

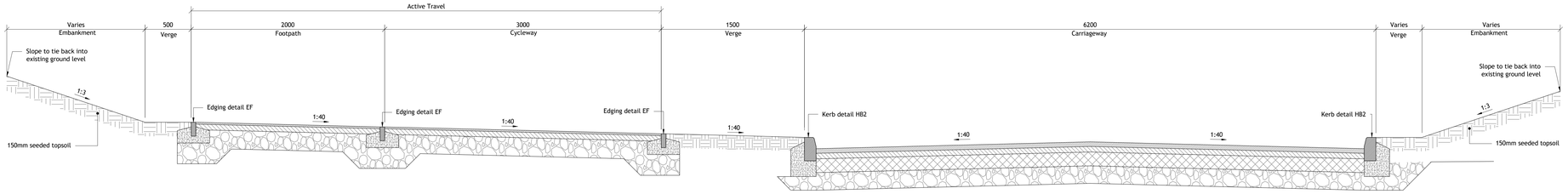
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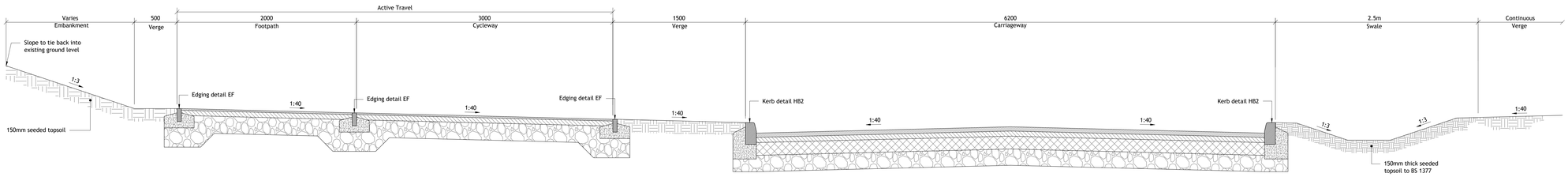
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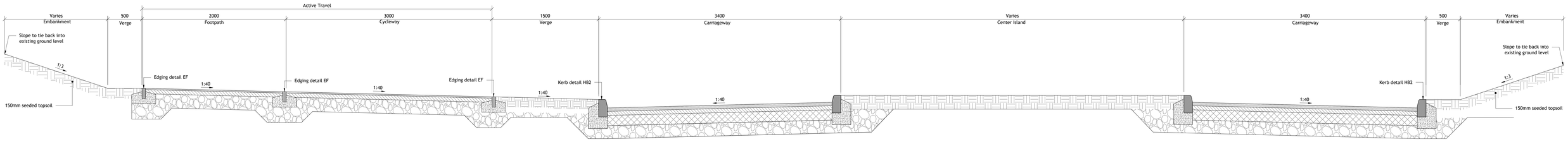
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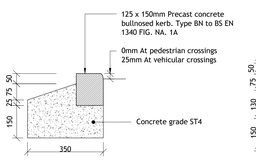
Section C-C
Through Carriageway & Active Travel
Scale 1:20



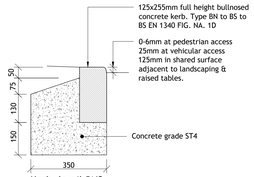
Section B-B
Through Carriageway, Active Travel & Swale
Scale 1:20



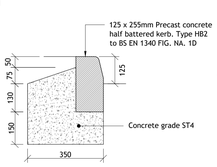
Section A-A
Through Carriageway, Active Travel & Island
Scale 1:20



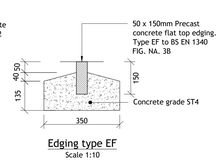
Kerb detail BN
Scale 1:10



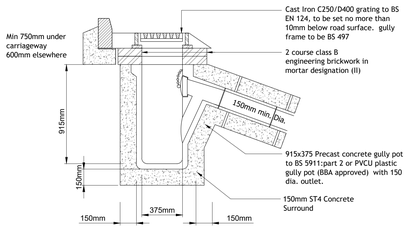
Kerb detail BN2
Scale 1:10



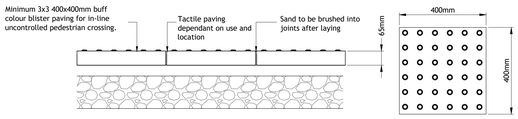
Kerb detail HB2
Scale 1:10



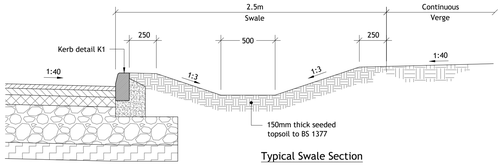
Edging type EF
Scale 1:10



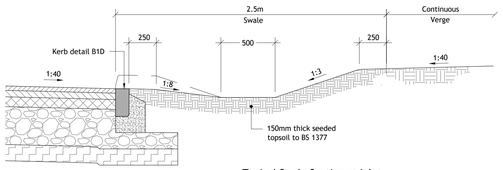
Precast Concrete/Plastic Highway Gully Detail
Scale 1:20



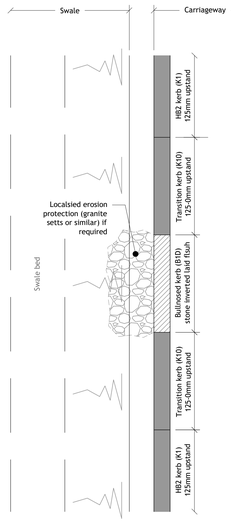
Tactile Paving
Scale 1:10



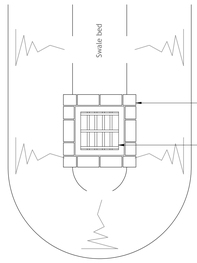
Typical Swale Section



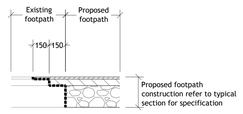
Typical Swale Section at Inlet



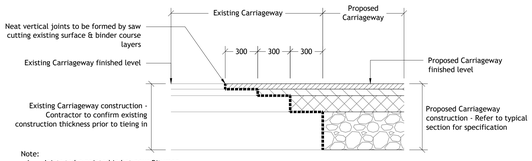
Typical Swale Inlet Detail



Typical Swale Outfall Detail
Scale 1:20

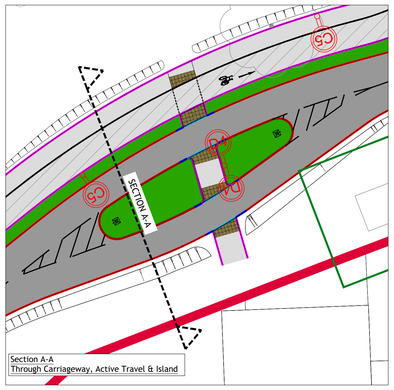


Footway tie in detail
Scale 1:20

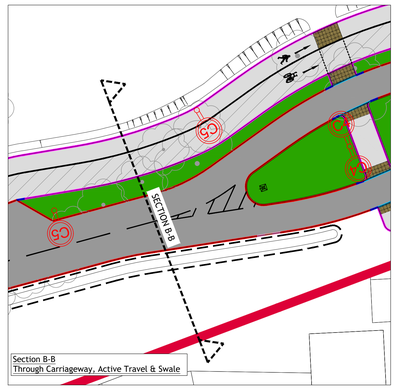


Note:
1. Joints to be painted in hot pour Bitumen.
2. All existing material material to be swept and tack coated prior to overlaying with new surfacing material

Carriageway tie in detail
Scale 1:20



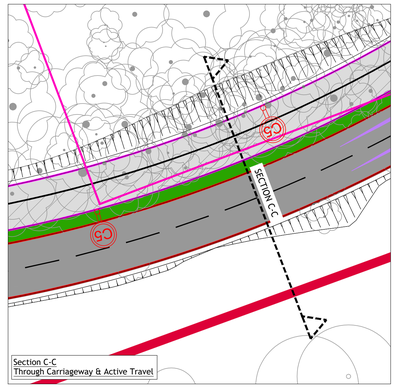
Section A-A
Through Carriageway, Active Travel & Island



Section B-B
Through Carriageway, Active Travel & Swale

Key (Kerbs):

- Precast concrete half battered kerb (HB2) 255x125mm laid with 125mm upstand
- Precast concrete bullnosed kerb (BN2) 255x125mm laid with 25mm upstand
- Precast concrete bullnosed kerb (BN2) 255x125mm laid with 0-6mm upstand
- Precast concrete bullnosed kerb (BN) 150x125mm stone inverted laid flush
- Precast concrete edging kerb (EF) 150x50mm laid flush
- Precast concrete transition kerb (DL/DR) 255x125mm (125-0-6mm)
- Precast concrete transition kerb 255x125mm (HB2-BN)



Section C-C
Through Carriageway & Active Travel

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SAFETY, HEALTH AND ENVIRONMENTAL

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It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

REV	DESCRIPTION	DRN	CHD	DATE
■	PRELIMINARY	☐	INFORMATION	☐	TENDER
☐	CONSTRUCTION	☐	AS BUILT		

SCALE	AS SHOWN @ A0	DATE	OCTOBER 2023
DRAWN	EML	CHK	MDF
DRAWING NO.	19244-ASHB-5-900	REV	-
TITLE	LAND NORTH EAST OF GREAT ASHBY STEVENAGE		
DETAILS	ROAD CONSTRUCTION DETAILS		

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Appendix L

Drainage Calculations

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Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Adoptable Manhole Type

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

>900 Link+900 mm

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

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.030	5.00		143.192	1200	525818.888	227924.140	1.517
2	0.233	5.00		143.232	1350	525815.095	227931.102	1.807
3	0.121	5.00		143.702	1200	525828.105	227977.519	1.577
4	0.027	5.00		143.449	1350	525846.445	227958.693	2.199
5	0.130	5.00		142.646	1200	525870.607	227998.403	1.446
6	0.000			142.562	1500	525874.936	227995.721	1.737
7	0.069	5.00		142.711	1500	525879.547	227989.063	2.011
8	0.036	5.00		142.712	1500	525884.650	227991.923	2.037
9	0.102	5.00		142.326	1200	525898.844	227933.975	1.576
10	0.025	5.00		141.992	1500	525912.633	227943.253	1.892
11	0.040	5.00		140.400	1200	525970.539	228050.639	1.425
12	0.100	5.00		141.728	1350	525918.915	228032.095	1.728
13	0.032	5.00		141.263	1350	525934.961	228033.848	1.738
14	0.024	5.00		140.905	1800	525946.282	228034.508	2.630
15	0.136	5.00		140.971	1350	525967.109	227993.653	1.746
16	0.095	5.00		141.331	1800	525948.392	227992.840	3.256
17	0.145	5.00		141.566	1800	525952.267	227922.552	3.716
18	0.006	5.00		141.509	1800	525950.863	227916.457	3.684
19	0.035	5.00		141.440	1800	525937.900	227905.955	3.665
20	0.040	5.00		141.447	1200	525900.217	227867.913	1.372
21	0.000			141.295	1200	525906.946	227863.820	1.370
22	0.000			139.975		525913.017	227860.970	1.000
23	0.065	5.00		139.875		525942.355	227889.422	1.000
24	0.008	5.00		141.241	1800	525948.407	227894.063	3.641
25	0.046	5.00		140.900	1800	525966.637	227873.583	3.375
26	0.043	5.00		140.402	1800	525993.024	227843.807	2.977
27	0.030	5.00		139.900	1200	526006.724	227829.290	1.425
28	0.055	5.00		140.287	1800	526002.547	227841.514	3.537
29	0.090	5.00		139.775	1800	526034.662	227870.448	3.125
30	0.044	5.00		139.235	1800	526066.777	227899.383	2.685
31	0.065	5.00		138.975	1200	526069.945	227913.187	1.725

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Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
32	0.025	5.00		138.875	1200	526075.108	227910.428	1.800
33	0.025	5.00		138.976	1800	526087.146	227900.667	2.526
34	0.045	5.00		138.333	1800	526107.949	227856.152	2.433
35	0.047	5.00		139.811	1200	525895.806	227759.972	1.511
36	0.040	5.00		139.938	1200	525974.507	227819.204	1.513
37	0.090	5.00		139.415	1200	525942.319	227794.703	1.515
38	0.004	5.00		139.067	1350	525951.573	227784.553	1.592
39	0.050	5.00		138.300	1350	525968.039	227768.292	1.950
40	0.063	5.00		138.300	1200	525937.192	227741.156	1.700
41	0.063	5.00		138.250	1350	525940.161	227738.126	1.900
42	0.000	5.00		138.250	1500	525943.729	227734.578	2.075
43	0.000	5.00		138.200	1800	525977.759	227758.341	2.425
44	0.030	5.00		138.341	1200	526031.330	227796.312	1.366
45	0.000	5.00		138.178	1200	526034.758	227792.146	1.353
46	0.000	5.00		138.100	1800	526037.061	227789.902	2.750
47	0.075	5.00		138.326	1200	526052.643	227807.955	1.726
48	0.034	5.00		138.225	1200	526056.250	227804.972	2.025
49	0.000	5.00		138.100	1800	526059.535	227802.456	2.825
50	0.076	5.00		138.125	1800	526088.118	227830.680	2.950
51	0.025	5.00		138.256	1200	526092.957	227847.046	1.356
52	0.000	5.00		138.156	1200	526097.833	227844.123	1.356
53	0.000	5.00		138.075	1800	526103.595	227841.422	2.950
54	0.031	5.00		138.174	1800	526116.565	227847.158	3.099
55	0.050	5.00		137.392	1800	526152.851	227827.365	2.392
56	0.030	5.00		136.876	1800	526164.798	227808.093	2.351
57	0.010	5.00		136.897	1800	526171.412	227803.292	2.397
58	0.035	5.00		136.905	1800	526172.046	227794.118	2.430
59	0.065	5.00		135.347	1800	526211.068	227721.061	2.372
60	0.095	5.00		135.398	1200	526222.343	227739.532	1.448
61	0.000	5.00		135.296	1200	526226.254	227734.556	1.546
62	0.000	5.00		134.300		526230.620	227729.004	1.500
63	0.041	5.00		134.883	1200	526269.465	227758.751	1.433
64	0.020	5.00		134.793	1200	526273.535	227753.617	1.443
65	0.000	5.00		133.600		526278.765	227746.734	1.500
66	0.080	5.00		134.629	1200	526285.535	227779.816	1.754
67	0.030	5.00		134.753	1200	526289.894	227768.887	2.078
68	0.025	5.00		134.485	1200	526299.761	227772.354	1.910
69	0.000	5.00		134.125	1200	526303.987	227763.491	1.725
70	0.000	5.00		132.725		526308.092	227757.490	1.500
71	0.000	5.00		132.950		526314.662	227746.780	1.800
72	0.000	5.00		132.825		526281.330	227687.056	1.800
73	0.000			132.825	1200	526265.963	227668.100	1.850
74	0.042	5.00		132.380	1350	526249.989	227658.113	1.555
75	0.050	5.00		131.436	1200	526244.037	227626.198	1.511
76	0.000	5.00		131.436	1200	526250.191	227621.911	1.686
77	0.000	5.00		131.032	1200	526256.345	227617.624	1.507
78	0.025	5.00		130.637	1350	526271.908	227620.695	1.787
79	0.048	5.00		137.059	1200	525791.645	227511.957	1.434
80	0.058	5.00		136.100	1200	525842.027	227528.697	1.500
81	0.063	5.00		135.800	1350	525867.644	227545.383	1.575
82	0.082	5.00		134.950	1350	525924.946	227558.757	1.575
83	0.107	5.00		134.750	1350	525946.834	227574.529	1.650

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Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
84	0.070	5.00		134.251	1350	525983.501	227588.969	1.651
85				132.800	1500	526029.344	227598.622	1.725
86				132.964	1500	526076.561	227625.457	2.114
87				132.718	1500	526089.467	227644.607	1.968
88	0.081	5.00		135.700	1200	526187.334	227726.449	1.425
89	0.025	5.00		135.568	1200	526187.305	227721.323	1.443
90				135.050		526186.296	227712.576	1.000
91				134.200		526141.213	227695.444	1.000
92				133.733	1200	526125.823	227685.227	1.433
93	0.040	5.00		134.197	1200	526085.421	227687.926	1.447
94	0.000	5.00		133.695	1200	526089.066	227679.370	1.445
95				133.105	1200	526100.667	227672.851	1.430
96		5.00		134.375		526187.632	227690.608	1.000
97				133.575		526118.413	227676.256	1.000
98				132.625		526102.111	227665.398	1.000
99	0.057	5.00		131.425		526096.154	227646.894	1.000
100	0.000			131.375		526108.125	227631.884	1.000
101	0.000			131.350		526122.881	227633.836	1.000
102	0.000			131.325		526137.704	227629.976	1.000
103	0.000			131.300		526147.231	227626.203	1.000
104	0.000			131.275		526156.650	227622.797	1.000
105	0.000			131.250		526167.897	227618.905	1.000
106	0.068	5.00		131.625	1200	526184.375	227625.700	1.425
107	0.000	5.00		131.500	1200	526182.331	227619.306	1.425
108	0.000			130.950		526180.846	227614.937	1.000
109	0.000			130.600		526198.635	227608.151	1.000
110	0.000			129.150		526220.051	227585.219	1.000
111	0.000			128.650		526237.383	227580.013	1.000
112	0.060	5.00		129.016	1200	526248.784	227586.833	1.441
113	0.020	5.00		128.701	1200	526249.728	227583.248	1.426
114	0.000			128.075		526252.293	227575.890	1.000
115	0.000			128.050		526260.045	227580.314	1.000
116	0.000			128.025		526263.350	227587.477	1.000
117	0.000			128.000		526267.939	227596.906	1.000
118	0.000			127.975		526270.604	227602.668	1.000
119	0.026	5.00		129.972	1500	526282.454	227607.639	3.122
120	0.027	5.00		127.905	1500	526325.081	227578.984	2.205
121	0.022	5.00		126.215	1500	526363.039	227559.481	3.240
122	0.030	5.00		122.720	1200	526385.097	227534.543	1.370
123	0.000	5.00		122.688	1200	526389.946	227539.370	1.413
124	0.023	5.00		124.739	1500	526398.436	227547.873	4.039
125	0.042	5.00		121.909	1200	526427.827	227542.794	1.359
126	0.050	5.00		123.481	1500	526429.978	227550.328	3.481
127	0.046	5.00		122.226	1500	526462.044	227551.149	3.126
128	0.031	5.00		123.272	1200	526444.215	227571.099	1.372
129	0.000	5.00		123.012	1200	526442.740	227567.290	1.237
130	0.000			122.725		526443.511	227564.481	1.000
131	0.000			122.575		526447.439	227564.877	1.000
132	0.000			122.175		526459.007	227566.142	1.000
133	0.031	5.00		121.975		526466.261	227566.925	1.000
134	0.000			121.600		526472.047	227565.824	1.000
135	0.000			121.050		526484.568	227563.542	1.000

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Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
136	0.025	5.00		122.387	1200	526487.950	227576.590	1.512
137	0.000	5.00		121.675	1200	526490.046	227569.389	1.500
138	0.000			120.675		526492.142	227562.188	1.000
139	0.000			120.475		526499.525	227560.139	1.000
140	0.100	5.00		122.000	1200	526518.815	227597.227	1.500
141	0.000	5.00		121.602	1200	526523.430	227593.700	1.502
142	0.025	5.00		121.066	1200	526528.993	227588.369	1.491
143	0.040	5.00		120.598	1200	526509.964	227562.120	2.048
144	0.085	5.00		120.853	1200	526498.178	227522.318	2.128
145	0.010	5.00		120.554	1200	526500.556	227532.365	2.429
146	0.106	5.00		120.451	1500	526503.707	227539.651	3.001
147	0.030	5.00		122.200	1200	526540.718	227430.316	1.425
148	0.030	5.00		122.405	1200	526536.709	227434.928	1.705
149	0.055	5.00		121.792	1200	526553.193	227451.819	1.517
150	0.070	5.00		121.251	1200	526555.544	227467.940	1.501
151	0.060	5.00		119.488	1200	526543.354	227501.112	1.513
152	0.000			118.805	1200	526544.967	227519.571	1.505
153	0.040	5.00		118.642	1500	526546.832	227527.068	2.317
154	0.045	5.00		140.831	1200	525966.868	227927.605	1.506
155	0.000	5.00		140.800	1200	525972.014	227922.504	1.650
156	0.055	5.00		140.075		525985.245	227913.315	1.000
157	0.000			139.575		526010.138	227937.345	1.000
158	0.080	5.00		139.400	1350	526013.541	227973.341	1.575
159	0.020	5.00		139.200	1350	526020.328	227970.149	1.575
160	0.055	5.00		138.225		526035.118	227961.458	1.000
161	0.000			137.675		526046.931	227972.862	1.000
162	0.000			136.275		526069.059	227994.222	1.000
163	0.075	5.00		135.750		526077.540	228002.409	1.000
164	0.000			134.750		526093.408	228017.727	1.000
165	0.000			134.125		526111.552	228035.242	1.000
166	0.000	5.00		134.100		526118.005	228041.471	1.000
167	0.320	5.00	5.0	137.616	1350	526185.049	228104.427	1.666
168	0.000			134.196	1350	526124.200	228048.256	1.671
169	0.000	5.00		133.800		526121.706	228038.674	1.500
170	0.000			133.750		526139.342	228024.783	1.500
171	0.070	5.00		133.725		526148.846	228017.297	1.500
172	0.000			133.700		526155.565	228012.005	1.500
173	0.000			133.675		526159.590	228008.595	1.500
174	0.100	5.00		134.000	1350	526176.830	228025.292	1.500
175	0.100	5.00		133.900	1350	526175.590	228017.896	1.500
176	0.000			133.650		526169.951	228000.295	1.500
177	0.100	5.00		132.434	1200	526209.779	227985.722	1.434
178	0.040	5.00		132.410	1350	526208.449	227978.442	1.710
179	0.040	5.00		132.150		526206.315	227972.251	1.500
180	0.200	5.00		139.123	1200	526306.812	228172.882	1.523
181	0.100	5.00		138.073	1350	526336.668	228129.095	1.673
182	0.000			137.889	1350	526336.608	228122.242	1.664
183	0.100	5.00		136.875	1200	526305.468	228095.835	1.500
184	0.055	5.00		136.875	1200	526306.434	228092.110	1.625
185	0.000			136.844	1350	526309.831	228084.245	1.819
186	0.100	5.00		135.318	1200	526314.151	228029.960	1.518
187	0.035	5.00		135.003	1350	526301.234	228036.674	1.603

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Nodes

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188	0.200	5.00		135.529	1200	526279.364	228058.399	1.579
189	0.075	5.00		135.190	1350	526280.921	228055.678	1.665
190	0.020	5.00		135.474	1500	526284.212	228047.891	2.449
191	0.050	5.00		134.015	1500	526259.125	228011.904	1.815
192	0.060	5.00		132.388	1500	526229.666	227970.022	1.888
193	0.045	5.00		132.202	1800	526224.813	227962.134	2.252
194	0.000			130.900		526243.874	227947.610	1.500
195	0.100	5.00		131.613	1200	526285.386	227951.139	1.513
196	0.038	5.00		130.728	1350	526272.241	227938.698	1.153
197	0.000	5.00		130.750		526262.215	227929.483	1.500
198	0.180	5.00		131.019	1350	526311.218	227925.067	1.594
199	0.075	5.00		129.950	1500	526296.553	227911.189	1.225
200	0.000	5.00		130.025		526284.732	227900.121	1.500
201	0.000			129.500		526312.565	227862.912	1.500
202	0.000			129.450		526359.957	227821.405	1.825
203	0.115	5.00		137.700	1200	526104.752	227927.378	1.500
204	0.100	5.00		135.900	1200	526117.080	227959.272	1.425
205	0.015	5.00		135.900	1200	526123.867	227956.081	1.550
206	0.020	5.00		135.885	1350	526130.113	227953.409	1.735
207	0.095	5.00		134.065	1350	526156.953	227979.861	1.665
208	0.010	5.00		133.777	1350	526164.497	227982.266	1.652
209	0.100	5.00		133.562	1350	526173.163	227981.240	1.712
210	0.170	5.00		133.026	1200	526202.112	227948.136	1.576
211	0.020	5.00		132.559	1500	526207.009	227955.385	1.884
212	0.020	5.00		131.776	1500	526237.603	227942.806	1.876
213	0.060	5.00		131.438	1200	526245.652	227923.886	1.438
214	0.020	5.00		131.416	1500	526252.732	227928.181	1.966
215	0.080	5.00		136.000	1200	526196.438	227838.786	1.425
216	0.020	5.00		135.294	1200	526203.118	227830.040	1.444
217	0.100	5.00		134.036	1200	526231.529	227838.899	1.511
218	0.019	5.00		133.925	1350	526225.633	227845.591	1.575
219	0.065	5.00		134.564	1200	526207.298	227869.418	1.439
220	0.300	5.00		133.769	1350	526228.178	227847.488	1.669
221	0.100	5.00		130.797	1800	526283.367	227886.566	1.972
222	0.100	5.00		130.670	1800	526308.000	227855.991	2.220
223	0.100	5.00		130.446	1200	526347.321	227807.652	1.596
224	0.050	5.00		129.918	1350	526351.752	227810.377	1.593
225	0.082	5.00		129.421	1500	526358.800	227815.287	2.296
226	0.020	5.00		128.154	1875	526382.997	227806.718	2.179
227	0.000	5.00		127.100	1200	526393.773	227798.452	1.000
228	0.033	5.00		127.558	1875	526394.966	227806.737	2.208
229	0.051	5.00		127.001	1875	526409.521	227813.054	2.201
230	0.000	5.00		126.475	1350	526418.218	227827.991	1.250
231	0.032	5.00		126.829	1875	526420.724	227819.964	2.204
232	0.020	5.00		126.646	1875	526435.273	227821.920	2.221
233	0.350	5.00		126.384	1875	526452.652	227813.438	2.209
234	0.050	5.00		128.357	2100	526467.549	227835.422	4.657
235	0.100	5.00		125.450		526491.299	227844.024	1.800
236	0.060	5.00		125.350		526514.549	227789.455	1.800
237	0.100	5.00		125.350	1200	526513.241	227782.869	1.875
238	0.055	5.00		124.995	1200	526487.559	227782.982	1.445
239	0.059	5.00		123.802	1350	526510.459	227763.631	1.577

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Nodes

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240	0.080	5.00		129.691	1200	526722.360	227766.986	1.441
241	0.040	5.00		128.496	1350	526690.300	227798.699	1.596
242	0.039	5.00		128.044	1350	526672.646	227809.518	1.669
243	0.033	5.00		129.046	1200	526653.956	227828.987	1.371
244	0.000	5.00		128.533	1200	526654.306	227821.920	1.358
245	0.045	5.00		128.264	1350	526652.421	227811.433	2.014
246	0.045	5.00		128.144	1350	526607.711	227797.275	2.069
247	0.200	5.00		126.752	1350	526580.584	227787.787	1.652
248	0.040	5.00		125.315	1200	526529.991	227786.165	1.365
249	0.010	5.00		124.832	1200	526529.270	227780.453	1.357
250	0.020	5.00		124.263	1350	526532.137	227771.743	1.663
251	0.045	5.00		123.822	1350	526520.458	227765.810	1.672
252	0.010	5.00		123.553	1800	526515.083	227759.567	2.028
253	0.034	5.00		122.400	1800	526536.679	227740.698	2.025
254	0.050	5.00		121.000	1800	526571.865	227700.971	2.025
255	0.000	5.00		125.750		526439.395	227813.100	1.000
256	0.000			125.325		526451.855	227801.953	1.000
257	0.020	5.00		124.775		526470.609	227788.116	1.000
258	0.020	5.00		123.250		526502.096	227759.650	1.000
259	0.000			122.300		526521.319	227745.682	1.000
260	0.000			120.825		526547.030	227709.457	1.000
261	0.000	5.00		120.600		526563.580	227695.739	1.000
262	0.100	5.00		120.535	1200	526588.067	227701.455	1.435
263	0.000	5.00		120.480	1200	526583.819	227697.817	1.430
264	0.020	5.00		120.822	1800	526575.284	227690.325	2.447
265	0.030	5.00		120.615	1800	526574.110	227675.962	2.340
266	0.100	5.00		121.050	1200	526550.658	227622.401	1.500
267	0.090	5.00		120.250	1350	526564.443	227650.200	1.650
268	0.060	5.00		120.470	1800	526571.687	227666.208	2.320
269	0.030	5.00		119.328	1800	526593.214	227659.089	2.028
270	0.025	5.00		118.990	1800	526606.462	227659.729	2.040
271	0.050	5.00		117.876	1800	526615.172	227629.891	2.026
272	0.150	5.00		116.766	2175	526623.648	227596.897	2.491
273	0.080	5.00		117.200	1200	526613.376	227597.493	1.725
274	0.032	5.00		117.000	1350	526615.545	227591.217	1.975
275	0.020	5.00		116.932	2175	526617.798	227583.003	2.807
276	0.090	5.00		116.811	2175	526597.650	227553.177	2.911
277	0.050	5.00		117.759	1200	526570.946	227547.799	1.509
278	0.010	5.00		117.759	1200	526573.042	227540.598	1.934
279	0.020	5.00		116.957	2175	526586.871	227536.376	3.182
280	0.060	5.00		117.273	2175	526580.206	227517.191	3.748
281	0.035	5.00		115.980	2175	526609.676	227504.803	2.905
282	0.050	5.00		116.600	1200	526592.546	227427.536	1.425
283	0.010	5.00		116.250	1200	526602.376	227429.473	1.425
284	0.020	5.00		115.546	1200	526612.920	227422.073	1.646
285	0.037	5.00		115.407	1200	526618.764	227431.843	1.707
286	0.020	5.00		115.113	1200	526626.413	227456.341	1.588
287	0.050	5.00		114.664	2175	526641.161	227490.009	2.814
288	0.084	5.00		114.369	2175	526651.413	227511.975	2.769
289	0.000	5.00		114.228	2100	526660.843	227516.790	2.753
290	0.127	5.00		115.542	1200	526653.235	227563.966	1.592
291	0.075	5.00		114.615	1350	526669.055	227536.120	1.665

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Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
292	0.040	5.00		114.142	2400	526668.539	227516.000	3.092
293	0.070	5.00		113.541	1200	526690.901	227517.780	1.441
294	0.010	5.00		113.442	1200	526691.553	227514.185	1.467
295	0.020	5.00		113.842	2400	526691.641	227509.079	3.242
296	0.000			112.075		526693.129	227496.870	1.500
297	0.045	5.00		113.354	1200	526751.451	227508.175	1.754
298	0.000	5.00		113.203	1200	526753.791	227501.050	1.878
299	0.000			111.950		526755.620	227495.305	1.500
300	0.025	5.00		126.414	1200	526598.506	227773.485	1.439
301	0.040	5.00		125.558	1200	526616.123	227767.284	1.433
302	0.000	5.00		124.929	1200	526627.150	227761.312	1.429
303	0.075	5.00		124.196	1350	526637.553	227751.017	1.596
304	0.080	5.00		123.862	1350	526646.102	227740.432	1.662
305	0.090	5.00		123.972	1350	526667.754	227693.535	1.972
306	0.060	5.00		129.885	1200	526754.588	227737.267	1.435
307	0.012	5.00		129.535	1200	526769.709	227722.475	1.435
308	0.015	5.00		128.939	1200	526783.243	227709.507	1.439
309	0.030	5.00		128.388	1200	526796.780	227699.159	1.438
310	0.015	5.00		128.344	1200	526779.316	227691.350	1.519
311	0.040	5.00		128.375	1200	526751.845	227701.857	1.500
312	0.026	5.00		128.100	1200	526751.699	227694.359	1.500
313	0.030	5.00		127.684	1200	526752.309	227679.869	1.509
314	0.050	5.00		125.475	1200	526709.299	227673.612	1.350
315	0.030	5.00		124.842	1200	526704.937	227662.967	1.367
316	0.060	5.00		124.548	1350	526703.146	227657.011	2.748
317	0.000			121.602	1350	526687.057	227626.819	1.652
318	0.000			120.650		526682.579	227617.354	1.000
319	0.000			120.475		526684.484	227612.551	1.000
320	0.000			119.950		526690.558	227598.184	1.000
321	0.000			118.900		526701.381	227580.240	1.000
322	0.000			117.550		526716.766	227561.529	1.000
323	0.000			115.775		526733.444	227545.411	1.000
324	0.000			113.775		526757.867	227527.218	1.000
325	0.000			111.800		526779.329	227512.208	1.600
326	0.000	5.00		114.413	3450	526806.954	227505.524	4.413
327	0.000	5.00		113.664	3450	526855.140	227541.169	4.089
328	0.000	5.00		117.431		526877.866	227531.001	8.031
329	0.000			120.524		526929.480	227465.527	11.299
330	0.000			117.302		526929.338	227407.906	8.202
331	0.000			111.525		526985.283	227363.802	2.575
332	0.000	5.00		110.650	4050	526987.608	227319.254	1.800
333	0.000	5.00		111.525	1200	526978.187	227302.208	2.725
334				107.850	1200	526959.650	227278.056	0.480

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	7.928	0.600	141.675	141.575	0.100	79.3	300	5.07	50.0
1.001	2	4	41.762	0.600	141.425	141.250	0.175	238.6	450	5.61	50.0
2.000	3	4	26.283	0.600	142.125	141.400	0.725	36.3	300	5.17	50.0
1.002	4	7	44.923	0.600	141.250	140.850	0.400	112.3	450	6.00	48.8
3.000	5	6	5.092	0.600	141.200	141.125	0.075	67.9	225	5.05	50.0
3.001	6	7	8.099	0.600	140.825	140.775	0.050	162.0	525	5.13	50.0
1.003	7	8	5.850	0.600	140.700	140.675	0.025	234.0	600	6.06	48.5
1.004	8	10	56.141	0.600	140.675	140.100	0.575	97.6	600	6.44	47.2
4.000	9	10	16.620	0.600	140.750	140.400	0.350	47.5	300	5.12	50.0
1.005	10	19	45.051	0.600	140.100	137.925	2.175	20.7	600	6.58	46.7
5.000	11	14	29.131	0.600	138.975	138.800	0.175	166.5	225	5.48	50.0
6.000	12	13	16.141	0.600	140.000	139.525	0.475	34.0	450	5.08	50.0
6.001	13	14	11.340	0.600	139.525	138.575	0.950	11.9	450	5.11	50.0
5.001	14	16	41.721	0.600	138.275	138.075	0.200	208.6	750	5.84	49.4
7.000	15	16	18.735	0.600	139.225	138.375	0.850	22.0	450	5.07	50.0
5.002	16	17	70.395	0.600	138.075	137.850	0.225	312.9	750	6.58	46.7
5.003	17	18	6.255	0.600	137.850	137.825	0.025	250.2	750	6.64	46.4
5.004	18	19	16.683	0.600	137.825	137.775	0.050	333.7	750	6.83	45.8
1.006	19	24	15.869	0.600	137.775	137.600	0.175	90.7	750	6.92	45.5
8.000	20	21	7.876	0.600	140.075	139.925	0.150	52.5	150	5.09	50.0
8.001	21	22	6.707	0.600	139.925	138.975	0.950	7.1	150	5.12	50.0
8.002	22	23	40.869	0.035	138.975	138.875	0.100	408.7	1000	5.85	49.4
8.003	23	24	7.627	0.600	138.875	138.125	0.750	10.2	225	5.88	49.3
1.007	24	25	27.418	0.600	137.600	137.525	0.075	365.6	750	7.23	44.5
1.008	25	26	39.785	0.600	137.525	137.425	0.100	397.9	750	7.70	43.0
1.009	26	28	9.795	0.600	137.425	136.750	0.675	14.5	750	7.73	42.9
9.000	27	28	12.918	0.600	138.475	137.275	1.200	10.8	225	5.05	50.0
1.010	28	29	43.227	0.600	136.750	136.650	0.100	432.3	750	8.26	41.4
1.011	29	30	43.227	0.600	136.650	136.550	0.100	432.3	750	8.80	40.0
1.012	30	33	20.409	0.600	136.550	136.450	0.100	204.1	750	8.98	39.5
10.000	31	32	5.854	0.600	137.250	137.150	0.100	58.5	225	5.06	50.0
10.001	32	33	15.498	0.600	137.075	136.900	0.175	88.6	300	5.21	50.0
1.013	33	34	49.136	0.600	136.450	135.900	0.550	89.3	750	9.25	38.9
1.014	34	54	12.455	0.600	135.900	135.150	0.750	16.6	750	9.28	38.8
11.000	35	37	58.049	0.600	138.300	137.900	0.400	145.1	300	5.74	49.8
12.000	36	37	40.452	0.600	138.425	137.900	0.525	77.1	300	5.38	50.0
11.001	37	38	13.735	0.600	137.900	137.550	0.350	39.2	300	5.83	49.4
11.002	38	39	23.142	0.600	137.475	136.425	1.050	22.0	375	5.93	49.0
11.003	39	43	13.910	0.600	136.350	136.075	0.275	50.6	450	6.01	48.7
13.000	40	41	4.242	0.600	136.600	136.500	0.100	42.4	300	5.03	50.0
13.001	41	42	5.032	0.600	136.350	136.250	0.100	50.3	450	5.06	50.0
13.002	42	43	41.506	0.600	136.175	136.000	0.175	237.2	525	5.54	50.0
11.004	43	46	67.178	0.600	135.775	135.425	0.350	191.9	750	6.57	46.7
14.000	44	45	5.395	0.600	136.975	136.825	0.150	36.0	150	5.05	50.0
14.001	45	46	3.215	0.600	136.825	136.025	0.800	4.0	150	5.06	50.0
11.005	46	49	25.743	0.600	135.350	135.275	0.075	343.2	825	6.84	45.7
15.000	47	48	4.681	0.600	136.600	136.275	0.325	14.4	225	5.02	50.0
15.001	48	49	4.138	0.600	136.200	135.800	0.400	10.3	300	5.04	50.0
11.006	49	50	40.169	0.600	135.275	135.175	0.100	401.7	825	7.29	44.3
11.007	50	53	18.840	0.600	135.175	135.125	0.050	376.8	825	7.50	43.6
16.000	51	52	5.685	0.600	136.900	136.800	0.100	56.9	150	5.07	50.0
16.001	52	53	6.364	0.600	136.800	135.800	1.000	6.4	150	5.10	50.0
11.008	53	54	14.182	0.600	135.125	135.075	0.050	283.6	825	7.63	43.2

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.015	54	55	41.333	0.600	135.075	135.000	0.075	551.1	825	9.83	37.6
1.016	55	56	22.675	0.600	135.000	134.525	0.475	47.7	825	9.92	37.4
1.017	56	57	8.173	0.600	134.525	134.500	0.025	326.9	825	10.00	37.2
1.018	57	58	9.196	0.600	134.500	134.475	0.025	367.8	825	10.10	37.0
1.019	58	59	82.825	0.600	134.475	132.975	1.500	55.2	825	10.45	36.3
1.020	59	62	21.104	0.600	132.975	132.800	0.175	120.6	825	10.58	36.0
17.000	60	61	6.329	0.600	133.950	133.825	0.125	50.6	225	5.06	50.0
17.001	61	62	7.063	0.600	133.750	133.325	0.425	16.6	300	5.09	50.0
1.021	62	65	51.306	0.035	132.800	132.100	0.700	73.3	1000	10.88	35.4
18.000	63	64	6.552	0.600	133.450	133.350	0.100	65.5	225	5.07	50.0
18.001	64	65	8.645	0.600	133.350	133.175	0.175	49.4	225	5.14	50.0
1.022	65	70	31.237	0.035	132.100	131.225	0.875	35.7	1000	11.00	35.2
19.000	66	67	11.766	0.600	132.875	132.750	0.125	94.1	225	5.15	50.0
19.001	67	68	10.458	0.600	132.675	132.575	0.100	104.6	300	5.26	50.0
19.002	68	69	9.819	0.600	132.575	132.400	0.175	56.1	300	5.34	50.0
19.003	69	70	7.271	0.600	132.400	131.750	0.650	11.2	300	5.36	50.0
1.023	70	71	12.565	0.600	131.225	131.150	0.075	167.5	825	11.10	35.0
1.024	71	72	68.396	0.035	131.150	131.025	0.125	547.2	825	13.92	0.0
1.025	72	73	24.402	0.600	131.025	130.975	0.050	488.0	300	14.50	0.0
1.026	73	74	18.839	0.600	130.975	130.900	0.075	251.2	300	14.81	0.0
1.027	74	78	43.365	0.600	130.825	128.850	1.975	22.0	375	15.00	29.2
20.000	75	76	7.500	0.600	129.925	129.750	0.175	42.9	300	5.05	50.0
20.001	76	77	7.500	0.600	129.750	129.525	0.225	33.3	300	5.10	50.0
20.002	77	78	15.863	0.600	129.525	128.925	0.600	26.4	300	5.18	50.0
1.028	78	119	16.783	0.600	128.850	127.075	1.775	9.5	375	15.05	29.1
21.000	79	80	53.090	0.600	135.625	134.675	0.950	55.9	225	5.50	50.0
21.001	80	81	30.572	0.600	134.600	134.300	0.300	101.9	300	5.83	49.4
21.002	81	82	58.842	0.600	134.225	133.375	0.850	69.2	375	6.28	47.7
21.003	82	83	26.979	0.600	133.375	133.175	0.200	134.9	375	6.57	46.7
21.004	83	84	39.408	0.600	133.100	132.600	0.500	78.8	450	6.86	45.7
21.005	84	85	46.848	0.600	132.600	131.150	1.450	32.3	450	7.07	44.9
21.006	85	86	54.310	0.600	131.075	130.850	0.225	241.4	525	7.70	43.0
21.007	86	87	23.093	0.600	130.850	130.750	0.100	230.9	525	7.97	42.2
21.008	87	99	7.067	0.600	130.750	130.700	0.050	141.3	525	8.03	42.0
22.000	88	89	5.126	0.600	134.275	134.125	0.150	34.2	225	5.04	50.0
22.001	89	90	8.805	0.600	134.125	134.050	0.075	117.4	225	5.16	50.0
22.002	90	91	48.228	0.035	134.050	133.200	0.850	56.7	1000	5.48	50.0
22.003	91	92	18.473	0.600	133.200	132.300	0.900	20.5	225	5.58	50.0
22.004	92	95	28.036	0.600	132.300	131.675	0.625	44.9	225	5.82	49.5
23.000	93	94	9.300	0.600	132.750	132.250	0.500	18.6	225	5.05	50.0
23.001	94	95	13.307	0.600	132.250	131.675	0.575	23.1	225	5.13	50.0
22.005	95	98	7.592	0.600	131.675	131.625	0.050	151.8	225	5.94	49.0
24.000	96	97	70.691	0.035	133.375	132.575	0.800	88.4	1000	5.58	50.0
24.001	97	98	19.587	0.035	132.575	131.625	0.950	20.6	1000	5.66	50.0
22.006	98	99	19.439	0.035	131.625	130.425	1.200	16.2	1000	6.01	48.7
21.009	99	100	19.199	0.600	130.425	130.375	0.050	384.0	600	8.29	41.3
21.010	100	101	14.885	0.035	130.375	130.350	0.025	595.4	1000	8.61	40.5
21.011	101	102	15.317	0.035	130.350	130.325	0.025	612.7	1000	8.94	39.6
21.012	102	103	10.247	0.035	130.325	130.300	0.025	409.9	1000	9.12	39.2
21.013	103	104	10.016	0.035	130.300	130.275	0.025	400.6	1000	9.29	38.8
21.014	104	105	11.901	0.035	130.275	130.250	0.025	476.1	1000	9.52	38.3
21.015	105	108	13.543	0.035	130.250	129.950	0.300	45.1	1000	9.60	38.1
25.000	106	107	6.713	0.600	130.200	130.075	0.125	53.7	225	5.06	50.0

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
25.001	107	108	4.614	0.600	130.075	130.025	0.050	92.3	225	5.12	50.0
21.016	108	109	19.039	0.035	129.950	129.600	0.350	54.4	1000	9.72	37.8
21.017	109	110	31.377	0.035	129.600	128.150	1.450	21.6	1000	9.85	37.5
21.018	110	111	18.097	0.035	128.150	127.650	0.500	36.2	1000	9.94	37.3
21.019	111	114	15.470	0.035	127.650	127.075	0.575	26.9	1000	10.01	37.2
26.000	112	113	3.707	0.600	127.575	127.275	0.300	12.4	225	5.02	50.0
26.001	113	114	7.792	0.600	127.275	127.225	0.050	155.8	225	5.14	50.0
21.020	114	115	8.926	0.035	127.075	127.050	0.025	357.0	1000	10.16	36.9
21.021	115	116	7.889	0.035	127.050	127.025	0.025	315.5	1000	10.28	36.6
21.022	116	117	10.486	0.035	127.025	127.000	0.025	419.5	1000	10.47	36.3
21.023	117	118	6.348	0.035	127.000	126.975	0.025	253.9	1000	10.56	36.1
21.024	118	119	12.850	0.035	126.975	126.850	0.125	102.8	600	10.83	35.5
1.029	119	120	51.363	0.600	126.850	125.700	1.150	44.7	600	15.28	28.9
1.030	120	121	42.675	0.600	125.700	122.975	2.725	15.7	600	15.40	28.7
1.031	121	124	37.252	0.600	122.975	120.700	2.275	16.4	600	15.50	28.6
27.000	122	123	6.842	0.600	121.350	121.275	0.075	91.2	150	5.11	50.0
27.001	123	124	12.016	0.600	121.275	121.150	0.125	96.1	150	5.30	50.0
1.032	124	126	31.637	0.600	120.700	120.000	0.700	45.2	600	15.65	28.5
28.000	125	126	7.835	0.600	120.550	120.450	0.100	78.4	150	5.11	50.0
1.033	126	127	32.077	0.600	120.000	119.100	0.900	35.6	600	15.78	28.3
1.034	127	146	43.220	0.600	119.100	117.450	1.650	26.2	600	15.93	28.1
29.000	128	129	4.085	0.600	121.900	121.775	0.125	32.7	150	5.04	50.0
29.001	129	130	2.913	0.600	121.775	121.725	0.050	58.3	150	5.08	50.0
29.002	130	131	3.948	0.035	121.725	121.575	0.150	26.3	1000	5.09	50.0
29.003	131	132	11.637	0.035	121.575	121.175	0.400	29.1	1000	5.15	50.0
29.004	132	133	7.296	0.035	121.175	120.975	0.200	36.5	1000	5.19	50.0
29.005	133	134	5.890	0.035	120.975	120.600	0.375	15.7	1000	5.21	50.0
29.006	134	135	12.727	0.035	120.600	120.050	0.550	23.1	1000	5.26	50.0
29.007	135	138	7.694	0.035	120.050	119.675	0.375	20.5	1000	5.29	50.0
30.000	136	137	7.500	0.600	120.875	120.175	0.700	10.7	300	5.03	50.0
30.001	137	138	7.500	0.600	120.175	119.675	0.500	15.0	300	5.06	50.0
29.008	138	139	7.662	0.035	119.675	119.475	0.200	38.3	1000	5.33	50.0
29.009	139	146	20.910	0.035	119.475	117.825	1.650	12.7	225	5.63	50.0
31.000	140	141	5.808	0.600	120.500	120.100	0.400	14.5	300	5.02	50.0
31.001	141	142	7.705	0.600	120.100	119.575	0.525	14.7	300	5.05	50.0
31.002	142	143	32.421	0.600	119.575	118.550	1.025	31.6	300	5.25	50.0
31.003	143	146	23.324	0.600	118.550	117.750	0.800	29.2	300	5.38	50.0
32.000	144	145	10.325	0.600	118.725	118.200	0.525	19.7	225	5.06	50.0
32.001	145	146	7.938	0.600	118.125	117.750	0.375	21.2	300	5.10	50.0
1.035	146	153	44.923	0.600	117.450	116.325	1.125	39.9	600	16.12	27.9
33.000	147	148	6.111	0.600	120.775	120.700	0.075	81.5	225	5.07	50.0
33.001	148	149	23.601	0.600	120.700	120.350	0.350	67.4	225	5.32	50.0
33.002	149	150	16.292	0.600	120.275	119.750	0.525	31.0	300	5.41	50.0
33.003	150	151	35.341	0.600	119.750	117.975	1.775	19.9	300	5.58	50.0
33.004	151	152	18.529	0.600	117.975	117.300	0.675	27.5	300	5.68	50.0
33.005	152	153	7.725	0.600	117.300	116.625	0.675	11.4	300	5.71	49.9
1.036	153	280	34.805	0.600	116.325	114.200	2.125	16.4	600	16.22	27.8
34.000	154	155	7.246	0.600	139.325	139.150	0.175	41.4	300	5.05	50.0
34.001	155	156	16.109	0.600	139.150	139.075	0.075	214.8	300	5.30	50.0
34.002	156	157	34.599	0.035	139.075	138.575	0.500	69.2	1000	5.55	50.0
34.003	157	160	34.719	0.035	138.575	137.225	1.350	25.7	1000	5.71	49.9
35.000	158	159	7.500	0.600	137.825	137.625	0.200	37.5	375	5.04	50.0
35.001	159	160	17.155	0.600	137.625	137.225	0.400	42.9	375	5.15	50.0

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
34.004	160	161	16.419	0.035	137.225	136.675	0.550	29.9	1000	5.78	49.6
34.005	161	162	30.755	0.035	136.675	135.275	1.400	22.0	1000	5.91	49.1
34.006	162	163	11.788	0.035	135.275	134.750	0.525	22.5	1000	5.96	48.9
34.007	163	164	22.055	0.035	134.750	133.750	1.000	22.1	1000	6.05	48.6
34.008	164	165	25.219	0.035	133.750	133.125	0.625	40.3	1000	6.19	48.1
34.009	165	166	8.969	0.035	133.125	133.100	0.025	358.8	1000	6.34	47.5
34.010	166	169	4.639	0.035	133.100	132.550	0.550	8.4	225	6.39	47.4
36.000	167	168	82.812	0.600	135.950	132.525	3.425	24.2	450	5.33	50.0
36.001	168	169	9.901	0.600	132.525	132.300	0.225	44.0	450	5.39	50.0
34.011	169	170	22.450	0.035	132.300	132.250	0.050	449.0	1000	6.72	46.2
34.012	170	171	12.098	0.035	132.250	132.225	0.025	483.9	1000	6.90	45.5
34.013	171	172	8.553	0.035	132.225	132.200	0.025	342.1	1000	7.01	45.1
34.014	172	173	5.275	0.035	132.200	132.175	0.025	211.0	1000	7.06	45.0
34.015	173	176	13.276	0.035	132.175	132.150	0.025	531.0	1000	7.27	44.3
37.000	174	175	7.499	0.600	132.500	132.400	0.100	75.0	300	5.07	50.0
37.001	175	176	18.482	0.600	132.400	132.325	0.075	246.4	300	5.38	50.0
34.016	176	179	45.922	0.035	132.150	130.650	1.500	30.6	1000	7.44	43.8
38.000	177	178	7.400	0.600	131.000	130.925	0.075	98.7	225	5.09	50.0
38.001	178	179	6.548	0.600	130.700	130.650	0.050	131.0	450	5.16	50.0
34.017	179	193	21.084	0.035	130.650	130.100	0.550	38.3	825	7.66	43.1
39.000	180	181	52.997	0.600	137.600	136.550	1.050	50.5	300	5.40	50.0
39.001	181	182	6.853	0.600	136.400	136.225	0.175	39.2	450	5.43	50.0
39.002	182	185	46.484	0.600	136.225	135.025	1.200	38.7	450	5.67	50.0
40.000	183	184	3.848	0.600	135.375	135.325	0.050	77.0	225	5.04	50.0
40.001	184	185	8.567	0.600	135.250	135.175	0.075	114.2	300	5.14	50.0
39.003	185	190	44.474	0.600	135.025	133.175	1.850	24.0	450	5.85	49.4
41.000	186	187	14.558	0.600	133.800	133.475	0.325	44.8	300	5.10	50.0
41.001	187	190	20.386	0.600	133.400	133.250	0.150	135.9	375	5.32	50.0
42.000	188	189	3.135	0.600	133.950	133.675	0.275	11.4	300	5.01	50.0
42.001	189	190	8.454	0.600	133.525	133.175	0.350	24.2	450	5.05	50.0
39.004	190	191	43.868	0.600	133.025	132.200	0.825	53.2	600	6.07	48.5
39.005	191	192	51.205	0.600	132.200	130.575	1.625	31.5	600	6.26	47.8
39.006	192	193	9.261	0.600	130.500	130.100	0.400	23.2	675	6.29	47.7
34.018	193	194	23.964	0.035	129.950	129.400	0.550	43.6	825	7.92	42.3
34.019	194	197	25.787	0.035	129.400	129.250	0.150	171.9	1000	8.16	41.7
43.000	195	196	18.099	0.600	130.100	129.725	0.375	48.3	225	5.16	50.0
43.001	196	197	13.618	0.600	129.575	129.375	0.200	68.1	375	5.26	50.0
34.020	197	200	37.002	0.035	129.250	128.525	0.725	51.0	1000	8.34	41.2
44.000	198	199	20.191	0.600	129.425	128.875	0.550	36.7	375	5.11	50.0
44.001	199	200	16.194	0.600	128.725	128.575	0.150	108.0	525	5.24	50.0
34.021	200	201	46.467	0.035	128.525	128.000	0.525	88.5	1000	8.64	40.4
34.022	201	202	62.999	0.035	128.000	127.625	0.375	168.0	1000	9.20	39.0
34.023	202	225	6.226	0.035	127.625	127.425	0.200	31.1	675	9.26	38.9
45.000	203	206	36.343	0.600	136.200	134.375	1.825	19.9	225	5.21	50.0
46.000	204	205	7.500	0.600	134.475	134.425	0.050	150.0	225	5.12	50.0
46.001	205	206	6.794	0.600	134.350	134.300	0.050	135.9	300	5.20	50.0
45.001	206	207	37.684	0.600	134.150	132.400	1.750	21.5	450	5.35	50.0
45.002	207	208	7.918	0.600	132.400	132.125	0.275	28.8	450	5.38	50.0
45.003	208	209	8.727	0.600	132.125	131.850	0.275	31.7	450	5.42	50.0
45.004	209	211	42.591	0.600	131.850	130.825	1.025	41.6	450	5.65	50.0
47.000	210	211	8.748	0.600	131.450	130.975	0.475	18.4	300	5.04	50.0
45.005	211	212	33.079	0.600	130.675	129.975	0.700	47.3	600	5.80	49.6
45.006	212	214	21.042	0.600	129.900	129.450	0.450	46.8	675	5.89	49.2

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
48.000	213	214	8.281	0.600	130.000	129.900	0.100	82.8	225	5.10	50.0
45.007	214	221	51.675	0.600	129.450	128.900	0.550	94.0	675	6.21	48.0
49.000	215	216	11.005	0.600	134.575	133.850	0.725	15.2	225	5.05	50.0
49.001	216	218	27.363	0.600	133.850	132.500	1.350	20.3	225	5.21	50.0
50.000	217	218	8.919	0.600	132.525	132.425	0.100	89.2	300	5.09	50.0
49.002	218	220	3.174	0.600	132.350	132.175	0.175	18.1	375	5.22	50.0
51.000	219	220	30.280	0.600	133.125	132.325	0.800	37.9	225	5.24	50.0
49.003	220	221	67.623	0.600	132.100	129.125	2.975	22.7	450	5.50	50.0
45.008	221	222	39.263	0.600	128.825	128.450	0.375	104.7	750	6.45	47.1
45.009	222	225	65.096	0.600	128.450	127.350	1.100	59.2	750	6.75	46.1
52.000	223	224	5.202	0.600	128.850	128.400	0.450	11.6	300	5.02	50.0
52.001	224	225	8.590	0.600	128.325	127.725	0.600	14.3	375	5.05	50.0
34.024	225	226	25.669	0.035	127.125	125.975	1.150	22.3	975	9.44	38.5
34.025	226	228	11.969	0.035	125.975	125.375	0.600	19.9	975	9.52	38.3
53.000	227	228	8.370	0.600	126.100	126.025	0.075	111.6	300	5.09	50.0
34.026	228	229	15.867	0.035	125.350	124.800	0.550	28.8	975	9.65	38.0
34.027	229	231	13.163	0.035	124.800	124.625	0.175	75.2	975	9.82	37.6
54.000	230	231	8.409	0.600	125.225	125.150	0.075	112.1	450	5.07	50.0
34.028	231	232	14.680	0.035	124.625	124.425	0.200	73.4	975	10.01	37.2
34.029	232	233	19.338	0.035	124.425	124.175	0.250	77.4	975	10.26	36.7
34.030	233	234	26.556	0.035	124.175	123.925	0.250	106.2	975	10.67	35.9
34.031	234	235	25.260	0.035	123.700	123.650	0.050	505.2	1200	11.41	34.5
34.032	235	236	59.316	0.035	123.650	123.550	0.100	593.2	1200	13.85	0.0
34.033	236	237	6.715	0.600	123.550	123.475	0.075	89.5	300	13.92	0.0
34.034	237	239	19.438	0.600	123.475	122.300	1.175	16.5	300	14.00	0.0
55.000	238	239	29.981	0.600	123.550	122.375	1.175	25.5	225	5.19	50.0
34.035	239	252	6.156	0.600	122.225	121.975	0.250	24.6	375	14.03	0.0
56.000	240	241	45.095	0.600	128.250	127.050	1.200	37.6	225	5.35	50.0
56.001	241	242	20.705	0.600	126.900	126.450	0.450	46.0	375	5.48	50.0
56.002	242	245	20.315	0.600	126.375	126.250	0.125	162.5	450	5.69	50.0
57.000	243	244	7.076	0.600	127.675	127.175	0.500	14.2	150	5.04	50.0
57.001	244	245	10.655	0.600	127.175	126.550	0.625	17.0	150	5.12	50.0
56.003	245	246	46.898	0.600	126.250	126.075	0.175	268.0	450	6.32	47.6
56.004	246	247	28.738	0.600	126.075	125.100	0.975	29.5	450	6.45	47.1
56.005	247	250	51.035	0.600	125.100	122.600	2.500	20.4	450	6.64	46.5
58.000	248	249	5.757	0.600	123.950	123.475	0.475	12.1	150	5.03	50.0
58.001	249	250	9.170	0.600	123.475	122.900	0.575	15.9	150	5.09	50.0
56.006	250	251	13.100	0.600	122.600	122.150	0.450	29.1	450	6.70	46.2
56.007	251	252	8.238	0.600	122.150	121.900	0.250	33.0	450	6.74	46.1
34.036	252	253	28.678	0.600	121.525	120.375	1.150	24.9	825	14.11	30.3
34.037	253	254	53.069	0.600	120.375	118.975	1.400	37.9	825	14.29	30.1
34.038	254	264	11.182	0.600	118.975	118.375	0.600	18.6	825	14.32	30.1
59.000	255	256	16.718	0.035	124.750	124.325	0.425	39.3	1000	5.09	50.0
59.001	256	257	23.306	0.035	124.325	123.775	0.550	42.4	1000	5.22	50.0
59.002	257	258	42.447	0.035	123.775	122.250	1.525	27.8	1000	5.42	50.0
59.003	258	259	23.762	0.035	122.250	121.300	0.950	25.0	1000	5.52	50.0
59.004	259	260	44.422	0.035	121.300	119.825	1.475	30.1	1000	5.74	49.8
59.005	260	261	21.496	0.035	119.825	119.600	0.225	95.5	1000	5.92	49.1
59.006	261	264	12.896	0.035	119.600	119.050	0.550	23.4	150	6.24	47.9
60.000	262	263	5.593	0.600	119.100	119.050	0.050	111.9	225	5.08	50.0
60.001	263	264	11.357	0.600	119.050	118.975	0.075	151.4	225	5.25	50.0
34.039	264	265	14.411	0.600	118.375	118.275	0.100	144.1	825	14.41	29.9
34.040	265	268	10.050	0.600	118.275	118.150	0.125	80.4	825	14.47	29.9

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
61.000	266	267	31.029	0.600	119.550	118.825	0.725	42.8	225	5.26	50.0
61.001	267	268	17.571	0.600	118.600	118.525	0.075	234.3	450	5.48	50.0
34.041	268	269	22.674	0.600	118.150	117.300	0.850	26.7	825	14.53	29.8
34.042	269	270	13.263	0.600	117.300	116.950	0.350	37.9	825	14.58	29.7
34.043	270	271	31.083	0.600	116.950	115.850	1.100	28.3	825	14.67	29.6
34.044	271	272	34.065	0.600	115.850	114.725	1.125	30.3	825	14.77	29.5
34.045	272	275	15.075	0.600	114.275	114.125	0.150	100.5	1275	14.84	29.4
62.000	273	274	6.640	0.600	115.475	115.250	0.225	29.5	225	5.05	50.0
62.001	274	275	8.517	0.600	115.025	114.950	0.075	113.6	450	5.12	50.0
34.046	275	276	35.994	0.600	114.125	113.900	0.225	160.0	1275	15.03	29.2
34.047	276	279	19.961	0.600	113.900	113.775	0.125	159.7	1275	15.14	29.0
63.000	277	278	7.500	0.600	116.250	115.825	0.425	17.6	300	5.03	50.0
63.001	278	279	14.459	0.600	115.825	114.750	1.075	13.5	300	5.09	50.0
34.048	279	280	20.310	0.600	113.775	113.525	0.250	81.2	1275	15.22	28.9
1.037	280	281	31.968	0.600	113.525	113.075	0.450	71.0	1275	16.33	27.7
1.038	281	287	34.787	0.600	113.075	111.850	1.225	28.4	1275	16.41	27.6
64.000	282	283	10.019	0.600	115.175	114.825	0.350	28.6	225	5.07	50.0
64.001	283	284	12.882	0.600	114.825	113.975	0.850	15.2	225	5.13	50.0
64.002	284	285	11.384	0.600	113.900	113.700	0.200	56.9	300	5.22	50.0
64.003	285	286	25.664	0.600	113.700	113.525	0.175	146.7	300	5.55	50.0
64.004	286	287	36.756	0.600	113.525	112.825	0.700	52.5	300	5.83	49.4
1.039	287	288	24.241	0.600	111.850	111.600	0.250	97.0	1275	16.52	27.5
1.040	288	289	10.588	0.600	111.600	111.475	0.125	84.7	1200	16.56	27.5
1.041	289	292	7.736	0.600	111.475	111.350	0.125	61.9	1200	16.59	27.4
65.000	290	291	32.026	0.600	113.950	113.025	0.925	34.6	300	5.20	50.0
65.001	291	292	20.127	0.600	112.950	112.175	0.775	26.0	375	5.29	50.0
1.042	292	295	24.116	0.600	111.050	110.600	0.450	53.6	1500	16.65	27.4
66.000	293	294	3.654	0.600	112.100	111.975	0.125	29.2	225	5.03	50.0
66.001	294	295	5.107	0.600	111.975	111.875	0.100	51.1	225	5.07	50.0
1.043	295	296	12.299	0.600	110.600	110.575	0.025	492.0	1500	16.76	27.3
1.044	296	299	62.511	0.035	110.575	110.450	0.125	500.1	1000	17.72	26.3
67.000	297	298	7.499	0.600	111.600	111.325	0.275	27.3	300	5.04	50.0
67.001	298	299	6.029	0.600	111.325	110.450	0.875	6.9	300	5.06	50.0
1.045	299	325	29.117	0.035	110.450	110.200	0.250	116.5	1000	17.93	26.1
68.000	300	301	18.676	0.600	124.975	124.125	0.850	22.0	225	5.11	50.0
68.001	301	302	12.540	0.600	124.125	123.500	0.625	20.1	225	5.18	50.0
68.002	302	303	14.636	0.600	123.500	122.750	0.750	19.5	225	5.26	50.0
68.003	303	304	13.606	0.600	122.600	122.275	0.325	41.9	375	5.35	50.0
68.004	304	305	51.654	0.600	122.200	122.000	0.200	258.3	450	6.03	48.7
68.005	305	316	50.859	0.600	122.000	121.800	0.200	254.3	450	6.70	46.3
69.000	306	307	21.153	0.600	128.450	128.100	0.350	60.4	225	5.21	50.0
69.001	307	308	18.744	0.600	128.100	127.500	0.600	31.2	225	5.34	50.0
69.002	308	310	18.577	0.600	127.500	126.825	0.675	27.5	225	5.47	50.0
70.000	309	310	19.130	0.600	126.950	126.825	0.125	153.0	225	5.30	50.0
69.003	310	313	29.346	0.600	126.825	126.250	0.575	51.0	225	5.73	49.8
71.000	311	312	7.499	0.600	126.875	126.600	0.275	27.3	300	5.04	50.0
71.001	312	313	14.503	0.600	126.600	126.175	0.425	34.1	300	5.13	50.0
69.004	313	316	54.217	0.600	126.175	121.950	4.225	12.8	300	5.94	49.0
72.000	314	315	11.504	0.600	124.125	123.475	0.650	17.7	150	5.08	50.0
72.001	315	316	6.219	0.600	123.475	122.100	1.375	4.5	150	5.10	50.0
68.006	316	317	34.211	0.600	121.800	119.950	1.850	18.5	450	6.82	45.8
68.007	317	318	10.471	0.600	119.950	119.650	0.300	34.9	450	6.87	45.6
68.008	318	319	5.167	0.035	119.650	119.475	0.175	29.5	1000	6.89	45.6

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
68.009	319	320	15.598	0.035	119.475	118.950	0.525	29.7	1000	6.97	45.3
68.010	320	321	20.955	0.035	118.950	117.900	1.050	20.0	1000	7.05	45.0
68.011	321	322	24.224	0.035	117.900	116.550	1.350	17.9	1000	7.14	44.7
68.012	322	323	23.194	0.035	116.550	114.775	1.775	13.1	1000	7.21	44.5
68.013	323	324	30.454	0.035	114.775	112.775	2.000	15.2	1000	7.31	44.2
68.014	324	325	26.190	0.035	112.775	110.800	1.975	13.3	1000	7.40	44.0
1.046	325	326	28.422	0.035	110.200	110.000	0.200	142.1	1275	18.36	25.7
1.047	326	327	59.937	0.035	110.000	109.650	0.350	171.2	1275	19.34	24.9
1.048	327	328	24.897	0.035	109.575	109.400	0.175	142.3	1350	19.69	24.6
1.049	328	329	83.372	0.035	109.400	109.225	0.175	476.4	1350	22.72	0.0
1.050	329	330	57.621	0.035	109.225	109.100	0.125	461.0	1350	24.78	0.0
1.051	330	331	71.239	0.035	109.100	108.950	0.150	474.9	1350	27.36	0.0
1.052	331	332	44.609	0.035	108.950	108.850	0.100	446.1	1350	28.92	0.0
1.053	332	333	19.476	0.600	108.850	108.800	0.050	389.5	300	29.33	0.0
1.054	333	334	30.446	0.600	108.800	107.370	1.430	21.3	300	29.48	0.0

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	✓	Check Discharge Rate(s)	✓
Rainfall Events	Singular	Drain Down Time (mins)	240	Check Discharge Volume	✓
Winter CV	1.000	Additional Storage (m³/ha)	20.0	100 year 360 minute (m³)	
Analysis Speed	Normal	Starting Level (m)			

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

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Node 73 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	130.975	Design Flow (l/s)	2.0
Replaces Downstream Link	✓	Design Depth (m)	1.850		

Depth (m)	Flow (l/s)
1.850	2.000

Node 237 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	123.475	Design Flow (l/s)	15.0
Replaces Downstream Link	✓	Design Depth (m)	1.875		

Depth (m)	Flow (l/s)
1.875	15.000

Node 333 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	108.800	Design Flow (l/s)	26.0
Replaces Downstream Link	✓	Design Depth (m)	2.725		

Depth (m)	Flow (l/s)
2.725	26.000

Node 166 Online Orifice Control

Flap Valve	x	Invert Level (m)	133.100	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.375		

Node 197 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	129.250	Design Flow (l/s)	1200.0
Replaces Downstream Link	✓	Design Depth (m)	1.500		

Head (m)	Flow (l/s)
1.500	1200.000

Node 261 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	119.600	Design Flow (l/s)	5.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
1.000	5.000

Node 114 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	127.075	Design Flow (l/s)	500.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

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Depth (m)	Flow (l/s)
1.000	500.000

Node 110 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	128.150	Design Flow (l/s)	600.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
1.000	600.000

Node 102 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	130.325	Design Flow (l/s)	700.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
1.000	700.000

Node 104 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	130.275	Design Flow (l/s)	650.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
1.000	650.000

Node 108 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	129.950	Design Flow (l/s)	600.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
1.000	600.000

Node 101 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	130.350	Design Flow (l/s)	2000.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Head (m)	Flow (l/s)
1.000	2000.000

Node 65 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	132.100	Design Flow (l/s)	1850.0
Replaces Downstream Link	✓	Design Depth (m)	1.500		

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Head (m)	Flow (l/s)
1.500	1850.000

Node 324 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	112.775	Design Flow (l/s)	580.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Head (m)	Flow (l/s)
1.000	580.000

Node 171 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	132.225	Design Flow (l/s)	1200.0
Replaces Downstream Link	✓	Design Depth (m)	1.500		

Head (m)	Flow (l/s)
1.500	1200.000

Node 173 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	132.175	Design Flow (l/s)	1200.0
Replaces Downstream Link	✓	Design Depth (m)	1.500		

Head (m)	Flow (l/s)
1.500	1200.000

Node 323 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	114.775	Design Flow (l/s)	600.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Head (m)	Flow (l/s)
1.000	600.000

Node 320 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	118.950	Design Flow (l/s)	600.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Head (m)	Flow (l/s)
1.000	600.000

Node 322 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	116.550	Design Flow (l/s)	575.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

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Head (m)	Flow (l/s)
1.000	575.000

Node 72 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	131.325
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	3614.1	0.0	1.500	4853.9	0.0

Node 236 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	123.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	5341.0	0.0	1.500	7112.5	0.0

Node 332 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	6378.6	0.0	1.500	8800.4	0.0

Node 11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	138.975
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	40.0	0.0	1.000	40.0	0.0	1.010	0.0	0.0

Node 227 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	126.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	2

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	212.7	0.0	1.000	457.7	0.0

Node 230 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	125.225
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	9

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	212.7	0.0	1.250	475.7	0.0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	141.708	0.033	3.0	0.0503	0.0000	OK
15 minute winter	2	10	141.533	0.108	26.0	0.4331	0.0000	OK
15 minute winter	3	10	142.177	0.052	12.0	0.1392	0.0000	OK
15 minute winter	4	11	141.361	0.111	39.8	0.1869	0.0000	OK
15 minute winter	5	10	141.277	0.077	12.9	0.2245	0.0000	OK
15 minute winter	6	10	140.896	0.071	12.7	0.1247	0.0000	OK
15 minute winter	7	11	140.854	0.154	58.4	0.3778	0.0000	OK
15 minute winter	8	11	140.802	0.127	61.8	0.2691	0.0000	OK
15 minute winter	9	10	140.802	0.052	10.1	0.1259	0.0000	OK
15 minute winter	10	11	140.190	0.090	73.7	0.1835	0.0000	OK
30 minute winter	11	23	139.005	0.030	3.0	1.2628	0.0000	OK
15 minute winter	12	10	140.043	0.043	9.9	0.1114	0.0000	OK
15 minute winter	13	10	139.563	0.038	13.0	0.0682	0.0000	OK
15 minute winter	14	11	138.344	0.069	15.9	0.1891	0.0000	OK
15 minute winter	15	10	139.269	0.044	13.5	0.1319	0.0000	OK
15 minute winter	16	11	138.189	0.114	37.9	0.3565	0.0000	OK
15 minute winter	17	12	138.004	0.154	50.2	0.5106	0.0000	OK
15 minute winter	18	12	137.981	0.156	48.4	0.4013	0.0000	OK
15 minute winter	19	12	137.957	0.182	123.1	0.4972	0.0000	OK
15 minute winter	20	10	140.120	0.045	4.0	0.0776	0.0000	OK
15 minute winter	21	10	139.951	0.026	3.9	0.0289	0.0000	OK
15 minute winter	22	12	139.001	0.026	3.9	0.0000	0.0000	OK
15 minute winter	23	12	138.911	0.036	9.1	0.0466	0.0000	OK
15 minute winter	24	12	137.848	0.248	133.3	0.6410	0.0000	OK
15 minute winter	25	12	137.759	0.234	137.3	0.6589	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	2.9	0.725	0.024	0.0321	
15 minute winter	2	1.001	4	25.3	0.868	0.122	1.2350	
15 minute winter	3	2.000	4	11.8	1.462	0.063	0.2114	
15 minute winter	4	1.002	7	39.6	1.328	0.130	1.3391	
15 minute winter	5	3.000	6	12.7	1.155	0.201	0.0561	
15 minute winter	6	3.001	7	12.5	0.752	0.033	0.1513	
15 minute winter	7	1.003	8	58.4	1.167	0.130	0.2937	
15 minute winter	8	1.004	10	61.7	1.781	0.089	1.9617	
15 minute winter	9	4.000	10	9.9	1.254	0.061	0.1316	
15 minute winter	10	1.005	19	72.6	2.794	0.048	1.1713	
30 minute winter	11	5.000	14	1.5	0.490	0.038	0.0918	
15 minute winter	12	6.000	13	9.8	1.402	0.018	0.1132	
15 minute winter	13	6.001	14	12.9	2.078	0.014	0.0702	
15 minute winter	14	5.001	16	15.8	0.520	0.018	1.2990	
15 minute winter	15	7.000	16	13.3	1.706	0.019	0.1463	
15 minute winter	16	5.002	17	36.6	0.707	0.053	3.7262	
15 minute winter	17	5.003	18	47.9	0.737	0.061	0.4086	
15 minute winter	18	5.004	19	48.7	0.676	0.072	1.2355	
15 minute winter	19	1.006	24	124.1	1.194	0.096	1.6565	
15 minute winter	20	8.000	21	3.9	1.237	0.160	0.0255	
15 minute winter	21	8.001	22	3.9	2.334	0.058	0.0127	
15 minute winter	22	8.002	23	3.3	0.097	0.001	1.3796	
15 minute winter	23	8.003	24	8.6	2.163	0.053	0.0304	
15 minute winter	24	1.007	25	133.7	1.097	0.208	3.3409	
15 minute winter	25	1.008	26	136.3	1.848	0.221	3.0655	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	12	137.529	0.104	139.6	0.2959	0.0000	OK
15 minute winter	27	10	138.497	0.022	3.0	0.0336	0.0000	OK
15 minute winter	28	13	137.016	0.266	145.5	0.7587	0.0000	OK
15 minute winter	29	13	136.913	0.263	150.8	0.8201	0.0000	OK
15 minute winter	30	13	136.777	0.227	154.3	0.6511	0.0000	OK
15 minute winter	31	10	137.300	0.050	6.4	0.0939	0.0000	OK
15 minute winter	32	10	137.132	0.057	8.8	0.0802	0.0000	OK
15 minute winter	33	13	136.641	0.191	160.2	0.5231	0.0000	OK
15 minute winter	34	14	136.018	0.118	161.2	0.3445	0.0000	OK
15 minute winter	35	11	138.345	0.045	4.7	0.0784	0.0000	OK
15 minute winter	36	10	138.461	0.036	4.0	0.0593	0.0000	OK
15 minute winter	37	11	137.965	0.065	17.2	0.1513	0.0000	OK
15 minute winter	38	11	137.527	0.052	17.3	0.0775	0.0000	OK
15 minute winter	39	11	136.420	0.070	21.9	0.1365	0.0000	OK
15 minute winter	40	10	136.642	0.042	6.2	0.0789	0.0000	OK
15 minute winter	41	10	136.405	0.055	12.3	0.1159	0.0000	OK
15 minute winter	42	11	136.245	0.070	12.3	0.1244	0.0000	OK
15 minute winter	43	12	135.873	0.098	34.0	0.2500	0.0000	OK
15 minute winter	44	10	137.011	0.036	3.0	0.0570	0.0000	OK
15 minute winter	45	10	136.845	0.020	3.0	0.0223	0.0000	OK
15 minute winter	46	12	135.468	0.118	35.5	0.2997	0.0000	OK
15 minute winter	47	10	136.638	0.038	7.4	0.0760	0.0000	OK
15 minute winter	48	10	136.239	0.039	10.7	0.0576	0.0000	OK
15 minute winter	49	12	135.407	0.132	44.2	0.3365	0.0000	OK
15 minute winter	50	14	135.369	0.194	51.1	0.5944	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	26	1.009	28	138.8	1.652	0.043	0.8621	
15 minute winter	27	9.000	28	3.0	1.545	0.019	0.0248	
15 minute winter	28	1.010	29	145.7	1.052	0.246	5.9847	
15 minute winter	29	1.011	30	151.8	1.218	0.257	5.3926	
15 minute winter	30	1.012	33	152.8	1.537	0.177	2.0418	
15 minute winter	31	10.000	32	6.3	1.026	0.093	0.0362	
15 minute winter	32	10.001	33	8.7	0.965	0.074	0.1396	
15 minute winter	33	1.013	34	159.4	2.454	0.122	3.2456	
15 minute winter	34	1.014	54	162.2	2.272	0.053	0.9134	
15 minute winter	35	11.000	37	4.5	0.511	0.049	0.5170	
15 minute winter	36	12.000	37	3.9	0.503	0.030	0.3225	
15 minute winter	37	11.001	38	16.9	1.550	0.095	0.1493	
15 minute winter	38	11.002	39	17.2	1.894	0.040	0.2107	
15 minute winter	39	11.003	43	21.9	1.454	0.048	0.2101	
15 minute winter	40	13.000	41	6.1	1.089	0.036	0.0240	
15 minute winter	41	13.001	42	12.3	1.181	0.027	0.0522	
15 minute winter	42	13.002	43	12.0	0.711	0.038	0.7024	
15 minute winter	43	11.004	46	33.0	0.989	0.037	2.2423	
15 minute winter	44	14.000	45	3.0	1.305	0.099	0.0125	
15 minute winter	45	14.001	46	2.9	2.253	0.033	0.0042	
15 minute winter	46	11.005	49	35.5	0.707	0.042	1.3060	
15 minute winter	47	15.000	48	7.3	1.756	0.053	0.0196	
15 minute winter	48	15.001	49	10.7	2.104	0.031	0.0210	
15 minute winter	49	11.006	50	45.1	0.719	0.057	2.8894	
15 minute winter	50	11.007	53	42.8	0.661	0.053	2.1098	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	51	10	136.937	0.037	2.5	0.0549	0.0000	OK
15 minute winter	52	10	136.820	0.020	2.5	0.0221	0.0000	OK
15 minute winter	53	14	135.365	0.240	44.4	0.6102	0.0000	OK
15 minute winter	54	14	135.362	0.287	206.6	0.7890	0.0000	OK
15 minute winter	55	14	135.177	0.177	210.4	0.5244	0.0000	OK
15 minute winter	56	14	134.834	0.309	211.6	0.8639	0.0000	OK
15 minute winter	57	15	134.773	0.273	210.2	0.7163	0.0000	OK
15 minute winter	58	15	134.645	0.170	208.3	0.4825	0.0000	OK
15 minute winter	59	15	133.193	0.218	212.7	0.6729	0.0000	OK
15 minute winter	60	10	134.009	0.059	9.4	0.1433	0.0000	OK
15 minute winter	61	10	133.789	0.039	9.3	0.0437	0.0000	OK
15 minute winter	62	15	132.976	0.176	216.9	0.0000	0.0000	OK
15 minute winter	63	10	133.490	0.040	4.1	0.0678	0.0000	OK
15 minute winter	64	10	133.394	0.044	6.0	0.0621	0.0000	OK
15 minute winter	65	16	132.275	0.175	221.3	0.0000	0.0000	OK
15 minute winter	66	10	132.936	0.061	7.9	0.1239	0.0000	OK
15 minute winter	67	10	132.742	0.067	10.8	0.0952	0.0000	OK
15 minute winter	68	10	132.642	0.067	13.2	0.0928	0.0000	OK
15 minute winter	69	11	132.441	0.041	13.0	0.0469	0.0000	OK
1440 minute winter	70	1680	131.509	0.284	23.4	0.0000	0.0000	OK
1440 minute winter	71	1470	131.509	0.359	23.4	0.0000	0.0000	SURCHARGED
1440 minute winter	72	1680	131.509	0.484	22.8	682.0664	0.0000	SURCHARGED
1440 minute winter	73	1650	131.509	0.534	0.9	0.6043	0.0000	SURCHARGED
15 minute winter	74	10	130.851	0.026	4.2	0.0513	0.0000	OK
15 minute winter	75	10	129.962	0.037	5.0	0.0659	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	51	16.000	52	2.5	1.077	0.104	0.0133	
15 minute winter	52	16.001	53	2.4	1.837	0.034	0.0084	
15 minute winter	53	11.008	54	43.2	0.422	0.046	2.0815	
15 minute winter	54	1.015	55	208.4	1.697	0.310	5.1403	
15 minute winter	55	1.016	56	210.3	1.609	0.091	3.0089	
15 minute winter	56	1.017	57	209.8	1.255	0.240	1.3678	
15 minute winter	57	1.018	58	207.4	1.811	0.252	1.0697	
15 minute winter	58	1.019	59	211.0	2.218	0.099	7.9215	
15 minute winter	59	1.020	62	213.8	2.202	0.148	2.0558	
15 minute winter	60	17.000	61	9.3	1.199	0.127	0.0490	
15 minute winter	61	17.001	62	9.2	1.783	0.034	0.0366	
15 minute winter	62	1.021	65	219.3	0.861	0.009	13.4521	
15 minute winter	63	18.000	64	4.0	0.793	0.063	0.0334	
15 minute winter	64	18.001	65	5.9	1.108	0.080	0.0464	
15 minute winter	65	Head/Flow	70	216.0				
15 minute winter	66	19.000	67	7.8	0.937	0.145	0.0977	
15 minute winter	67	19.001	68	10.7	0.916	0.098	0.1220	
15 minute winter	68	19.002	69	13.0	1.517	0.088	0.0857	
15 minute winter	69	19.003	70	13.0	2.271	0.039	0.0417	
1440 minute winter	70	1.023	71	23.4	0.504	0.019	2.4215	
1440 minute winter	71	1.024	72	22.8	0.067	0.109	61.1236	
1440 minute winter	72	1.025	73	0.9	0.097	0.017	1.7184	
1440 minute winter	73	Depth/Flow	74	0.6				
15 minute winter	74	1.027	78	4.1	0.986	0.010	0.1817	
15 minute winter	75	20.000	76	4.9	1.053	0.029	0.0353	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	76	10	129.785	0.035	4.9	0.0391	0.0000	OK
15 minute winter	77	11	129.557	0.032	4.9	0.0357	0.0000	OK
15 minute winter	78	11	128.885	0.035	11.4	0.0597	0.0000	OK
15 minute winter	79	11	135.664	0.039	4.8	0.0707	0.0000	OK
15 minute winter	80	11	134.662	0.062	10.1	0.1184	0.0000	OK
15 minute winter	81	11	134.290	0.065	16.0	0.1445	0.0000	OK
15 minute winter	82	11	133.471	0.096	23.6	0.2363	0.0000	OK
15 minute winter	83	11	133.195	0.095	33.0	0.2581	0.0000	OK
15 minute winter	84	11	132.680	0.080	39.4	0.1829	0.0000	OK
15 minute winter	85	12	131.201	0.126	38.6	0.2234	0.0000	OK
15 minute winter	86	12	130.978	0.128	39.1	0.2254	0.0000	OK
15 minute winter	87	13	130.864	0.113	38.4	0.2005	0.0000	OK
15 minute winter	88	10	134.322	0.047	8.0	0.1069	0.0000	OK
15 minute winter	89	10	134.198	0.073	10.4	0.1083	0.0000	OK
15 minute winter	90	11	134.078	0.028	10.3	0.0000	0.0000	OK
15 minute winter	91	12	133.243	0.043	10.1	0.0000	0.0000	OK
15 minute winter	92	13	132.352	0.052	9.1	0.0585	0.0000	OK
15 minute winter	93	10	132.778	0.028	4.0	0.0479	0.0000	OK
15 minute winter	94	10	132.279	0.029	4.0	0.0330	0.0000	OK
15 minute winter	95	12	131.757	0.082	12.3	0.0924	0.0000	OK
15 minute winter	96	1	133.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	97	1	132.575	0.000	0.0	0.0000	0.0000	OK
15 minute winter	98	13	131.647	0.021	12.0	0.0000	0.0000	OK
15 minute winter	99	13	130.575	0.150	53.7	0.1707	0.0000	OK
15 minute winter	100	13	130.512	0.137	54.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	76	20.001	77	4.9	1.171	0.025	0.0315	
15 minute winter	77	20.002	78	4.9	1.257	0.022	0.0614	
15 minute winter	78	1.028	119	11.3	2.251	0.017	0.0844	
15 minute winter	79	21.000	80	4.6	0.996	0.066	0.2446	
15 minute winter	80	21.001	81	10.1	0.972	0.092	0.3168	
15 minute winter	81	21.002	82	16.0	0.932	0.066	1.0222	
15 minute winter	82	21.003	83	23.0	1.077	0.134	0.5778	
15 minute winter	83	21.004	84	32.9	1.524	0.090	0.8524	
15 minute winter	84	21.005	85	38.6	2.062	0.068	0.8783	
15 minute winter	85	21.006	86	39.1	0.972	0.126	2.1819	
15 minute winter	86	21.007	87	38.4	1.032	0.121	0.8600	
15 minute winter	87	21.008	99	38.5	1.171	0.094	0.2323	
15 minute winter	88	22.000	89	7.9	0.931	0.089	0.0442	
15 minute winter	89	22.001	90	10.3	1.566	0.216	0.0613	
15 minute winter	90	22.002	91	10.1	0.306	0.001	1.8725	
15 minute winter	91	22.003	92	9.1	1.523	0.079	0.1111	
15 minute winter	92	22.004	95	9.1	0.928	0.117	0.2776	
15 minute winter	93	23.000	94	4.0	1.342	0.033	0.0274	
15 minute winter	94	23.001	95	3.9	0.817	0.036	0.1043	
15 minute winter	95	22.005	98	12.0	1.773	0.286	0.0564	
15 minute winter	96	24.000	97	0.0	0.000	0.000	0.0022	
15 minute winter	97	24.001	98	0.0	0.000	0.000	0.2244	
15 minute winter	98	22.006	99	12.0	0.112	0.001	2.3320	
15 minute winter	99	21.009	100	54.5	1.060	0.156	0.9886	
15 minute winter	100	21.010	101	54.7	0.392	0.017	2.1436	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	14	130.429	0.079	54.7	0.0000	0.0000	OK
15 minute winter	102	14	130.402	0.077	53.8	0.0000	0.0000	OK
15 minute winter	103	14	130.422	0.122	53.8	0.0000	0.0000	OK
15 minute winter	104	14	130.358	0.083	54.1	0.0000	0.0000	OK
15 minute winter	105	14	130.320	0.070	54.2	0.0000	0.0000	OK
15 minute winter	106	10	130.249	0.049	6.7	0.1016	0.0000	OK
15 minute winter	107	10	130.130	0.055	6.6	0.0624	0.0000	OK
15 minute winter	108	14	130.045	0.095	57.4	0.0000	0.0000	OK
15 minute winter	109	14	129.658	0.058	57.0	0.0000	0.0000	OK
15 minute winter	110	15	128.243	0.093	56.4	0.0000	0.0000	OK
15 minute winter	111	15	127.711	0.061	55.6	0.0000	0.0000	OK
15 minute winter	112	10	127.606	0.030	5.9	0.0599	0.0000	OK
15 minute winter	113	10	127.343	0.068	7.9	0.0958	0.0000	OK
15 minute winter	114	16	127.189	0.114	58.1	0.0000	0.0000	OK
15 minute winter	115	16	127.194	0.144	57.0	0.0000	0.0000	OK
15 minute winter	116	17	127.185	0.160	56.6	0.0000	0.0000	OK
15 minute winter	117	17	127.176	0.176	55.1	0.0000	0.0000	OK
15 minute winter	118	17	127.173	0.198	54.1	0.0000	0.0000	OK
15 minute winter	119	17	126.951	0.101	57.2	0.1948	0.0000	OK
15 minute winter	120	17	125.775	0.075	57.6	0.1509	0.0000	OK
15 minute winter	121	17	123.049	0.074	57.8	0.1413	0.0000	OK
15 minute winter	122	10	121.393	0.042	3.0	0.0667	0.0000	OK
15 minute winter	123	11	121.317	0.042	2.9	0.0474	0.0000	OK
15 minute winter	124	17	120.799	0.099	58.4	0.1866	0.0000	OK
15 minute winter	125	10	120.599	0.049	4.2	0.0850	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	Head/Flow	102	53.8				
15 minute winter	102	Depth/Flow	103	53.8				
15 minute winter	103	21.013	104	54.1	0.404	0.014	1.3580	
15 minute winter	104	Depth/Flow	105	54.2				
15 minute winter	105	21.015	108	54.1	0.531	0.005	1.3990	
15 minute winter	106	25.000	107	6.6	0.958	0.093	0.0465	
15 minute winter	107	25.001	108	6.5	0.899	0.121	0.0336	
15 minute winter	108	Depth/Flow	109	57.0				
15 minute winter	109	21.017	110	56.4	0.696	0.003	2.9208	
15 minute winter	110	Depth/Flow	111	55.6				
15 minute winter	111	21.019	114	55.5	0.512	0.004	1.7411	
15 minute winter	112	26.000	113	5.9	0.918	0.039	0.0246	
15 minute winter	113	26.001	114	7.8	0.791	0.187	0.0765	
15 minute winter	114	Depth/Flow	115	57.0				
15 minute winter	115	21.021	116	56.6	0.283	0.013	1.7471	
15 minute winter	116	21.022	117	55.1	0.224	0.015	2.6539	
15 minute winter	117	21.023	118	54.1	0.185	0.011	1.8567	
15 minute winter	118	21.024	119	54.4	0.995	0.242	0.7201	
15 minute winter	119	1.029	120	57.3	2.246	0.056	1.3187	
15 minute winter	120	1.030	121	57.5	2.863	0.033	0.8574	
15 minute winter	121	1.031	124	57.5	2.300	0.034	0.9379	
15 minute winter	122	27.000	123	2.9	0.731	0.158	0.0276	
15 minute winter	123	27.001	124	2.9	0.742	0.161	0.0472	
15 minute winter	124	1.032	126	58.0	1.967	0.057	0.9346	
15 minute winter	125	28.000	126	4.1	0.863	0.204	0.0372	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	126	24	120.096	0.095	59.4	0.1961	0.0000	OK
30 minute winter	127	24	119.185	0.085	60.6	0.1752	0.0000	OK
15 minute winter	128	10	121.933	0.033	3.1	0.0525	0.0000	OK
15 minute winter	129	10	121.815	0.039	3.1	0.0446	0.0000	OK
15 minute winter	130	10	121.736	0.011	3.0	0.0000	0.0000	OK
15 minute winter	131	11	121.586	0.011	3.0	0.0000	0.0000	OK
15 minute winter	132	11	121.187	0.012	3.0	0.0000	0.0000	OK
15 minute winter	133	11	120.989	0.014	5.9	0.0087	0.0000	OK
15 minute winter	134	11	120.616	0.016	5.9	0.0000	0.0000	OK
15 minute winter	135	11	120.065	0.015	5.9	0.0000	0.0000	OK
15 minute winter	136	10	120.893	0.018	2.5	0.0269	0.0000	OK
15 minute winter	137	10	120.195	0.020	2.5	0.0225	0.0000	OK
15 minute winter	138	11	119.697	0.022	8.2	0.0000	0.0000	OK
15 minute winter	139	12	119.538	0.063	8.2	0.0000	0.0000	OK
15 minute winter	140	10	120.540	0.040	9.9	0.0987	0.0000	OK
15 minute winter	141	10	120.138	0.037	9.8	0.0424	0.0000	OK
15 minute winter	142	10	119.625	0.050	12.3	0.0733	0.0000	OK
15 minute winter	143	11	118.607	0.057	16.1	0.0874	0.0000	OK
15 minute winter	144	10	118.767	0.042	8.4	0.0813	0.0000	OK
15 minute winter	145	10	118.167	0.042	9.3	0.0510	0.0000	OK
15 minute winter	146	11	117.563	0.113	81.4	0.2793	0.0000	OK
15 minute winter	147	10	120.811	0.036	3.0	0.0556	0.0000	OK
15 minute winter	148	10	120.747	0.047	6.0	0.0692	0.0000	OK
15 minute winter	149	10	120.323	0.048	11.1	0.0893	0.0000	OK
15 minute winter	150	10	119.804	0.054	17.9	0.1108	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	126	1.033	127	59.3	2.237	0.051	0.8517	
30 minute winter	127	1.034	146	60.5	2.037	0.045	1.3052	
15 minute winter	128	29.000	129	3.1	0.933	0.098	0.0134	
15 minute winter	129	29.001	130	3.0	1.558	0.130	0.0062	
15 minute winter	130	29.002	131	3.0	0.266	0.000	0.0451	
15 minute winter	131	29.003	132	3.0	0.252	0.000	0.1401	
15 minute winter	132	29.004	133	3.0	0.223	0.000	0.0985	
15 minute winter	133	29.005	134	5.9	0.381	0.000	0.0917	
15 minute winter	134	29.006	135	5.9	0.367	0.000	0.2055	
15 minute winter	135	29.007	138	5.9	0.299	0.000	0.1509	
15 minute winter	136	30.000	137	2.5	1.329	0.007	0.0140	
15 minute winter	137	30.001	138	2.5	1.276	0.009	0.0158	
15 minute winter	138	29.008	139	8.2	0.174	0.001	0.3764	
15 minute winter	139	29.009	146	8.0	0.878	0.171	0.1903	
15 minute winter	140	31.000	141	9.8	1.851	0.034	0.0309	
15 minute winter	141	31.001	142	9.8	1.543	0.034	0.0491	
15 minute winter	142	31.002	143	12.1	1.423	0.061	0.2765	
15 minute winter	143	31.003	146	15.9	1.722	0.077	0.2150	
15 minute winter	144	32.000	145	8.3	1.672	0.071	0.0513	
15 minute winter	145	32.001	146	9.2	1.608	0.038	0.0456	
15 minute winter	146	1.035	153	80.8	2.347	0.074	1.5547	
15 minute winter	147	33.000	148	3.0	0.594	0.051	0.0305	
15 minute winter	148	33.001	149	5.8	0.991	0.091	0.1379	
15 minute winter	149	33.002	150	11.0	1.398	0.055	0.1287	
15 minute winter	150	33.003	151	17.7	1.666	0.071	0.3772	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	151	11	118.047	0.071	23.6	0.1375	0.0000	OK
15 minute winter	152	11	117.358	0.058	23.5	0.0660	0.0000	OK
15 minute winter	153	12	116.429	0.104	107.3	0.2197	0.0000	OK
15 minute winter	154	10	139.358	0.033	4.5	0.0572	0.0000	OK
15 minute winter	155	10	139.200	0.050	4.5	0.0564	0.0000	OK
15 minute winter	156	11	139.110	0.035	9.7	0.0381	0.0000	OK
15 minute winter	157	12	138.596	0.021	9.7	0.0000	0.0000	OK
15 minute winter	158	10	137.866	0.041	7.9	0.0999	0.0000	OK
15 minute winter	159	10	137.673	0.048	9.8	0.0811	0.0000	OK
15 minute winter	160	11	137.263	0.038	23.4	0.0419	0.0000	OK
15 minute winter	161	12	136.709	0.034	22.7	0.0000	0.0000	OK
15 minute winter	162	12	135.309	0.034	22.9	0.0000	0.0000	OK
15 minute winter	163	12	134.789	0.039	28.4	0.0584	0.0000	OK
15 minute winter	164	13	133.796	0.046	28.2	0.0000	0.0000	OK
15 minute winter	165	14	133.230	0.105	27.7	0.0000	0.0000	OK
15 minute winter	166	14	133.224	0.124	24.5	0.0000	0.0000	OK
15 minute winter	167	10	136.021	0.071	36.7	0.3723	0.0000	OK
15 minute winter	168	11	132.609	0.084	36.1	0.1202	0.0000	OK
15 minute winter	169	13	132.428	0.128	51.2	0.0000	0.0000	OK
15 minute winter	170	14	132.387	0.137	50.3	0.0000	0.0000	OK
15 minute winter	171	14	132.370	0.145	51.8	0.1353	0.0000	OK
15 minute winter	172	14	132.306	0.106	51.4	0.0000	0.0000	OK
15 minute winter	173	14	132.282	0.107	51.5	0.0000	0.0000	OK
15 minute winter	174	10	132.556	0.056	9.9	0.1538	0.0000	OK
15 minute winter	175	10	132.509	0.109	19.7	0.3009	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	151	33.004	152	23.5	2.096	0.110	0.2079	
15 minute winter	152	33.005	153	23.5	2.590	0.071	0.0702	
15 minute winter	153	1.036	280	106.8	3.373	0.063	1.1017	
15 minute winter	154	34.000	155	4.5	0.760	0.026	0.0430	
15 minute winter	155	34.001	156	4.4	0.727	0.058	0.0973	
15 minute winter	156	34.002	157	9.7	0.327	0.001	1.0341	
15 minute winter	157	34.003	160	9.2	0.289	0.001	1.1219	
15 minute winter	158	35.000	159	7.8	1.070	0.024	0.0549	
15 minute winter	159	35.001	160	9.8	1.493	0.032	0.1181	
15 minute winter	160	34.004	161	22.7	0.572	0.002	0.6581	
15 minute winter	161	34.005	162	22.9	0.604	0.001	1.1658	
15 minute winter	162	34.006	163	22.6	0.556	0.001	0.4793	
15 minute winter	163	34.007	164	28.2	0.595	0.002	1.0476	
15 minute winter	164	34.008	165	27.7	0.363	0.002	2.3668	
15 minute winter	165	34.009	166	24.5	0.168	0.006	1.3818	
15 minute winter	166	Orifice	169	24.1				
15 minute winter	167	36.000	168	36.1	2.001	0.055	1.4959	
15 minute winter	168	36.001	169	35.9	1.461	0.073	0.2747	
15 minute winter	169	34.011	170	50.3	0.288	0.005	4.1267	
15 minute winter	170	34.012	171	48.3	0.246	0.005	2.4251	
15 minute winter	171	Head/Flow	172	51.4				
15 minute winter	172	34.014	173	51.5	0.370	0.004	0.7421	
15 minute winter	173	Head/Flow	176	51.6				
15 minute winter	174	37.000	175	9.8	0.626	0.076	0.1201	
15 minute winter	175	37.001	176	19.2	0.855	0.273	0.4158	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	176	13	132.219	0.069	64.0	0.0000	0.0000	OK
15 minute winter	177	10	131.071	0.071	9.9	0.1792	0.0000	OK
15 minute winter	178	14	130.814	0.114	13.7	0.2170	0.0000	OK
15 minute winter	179	13	130.815	0.165	75.8	0.0880	0.0000	OK
15 minute winter	180	10	137.671	0.071	19.8	0.2683	0.0000	OK
15 minute winter	181	10	136.480	0.080	28.9	0.2096	0.0000	OK
15 minute winter	182	11	136.296	0.071	28.7	0.1015	0.0000	OK
15 minute winter	183	10	135.445	0.070	9.9	0.1715	0.0000	OK
15 minute winter	184	10	135.333	0.083	15.2	0.1501	0.0000	OK
15 minute winter	185	11	135.104	0.079	43.5	0.1135	0.0000	OK
15 minute winter	186	10	133.851	0.051	9.9	0.1246	0.0000	OK
15 minute winter	187	10	133.472	0.072	13.2	0.1340	0.0000	OK
15 minute winter	188	10	134.008	0.058	19.8	0.2121	0.0000	OK
15 minute winter	189	10	133.592	0.067	27.0	0.1554	0.0000	OK
15 minute winter	190	11	133.151	0.126	84.7	0.2423	0.0000	OK
15 minute winter	191	11	132.311	0.111	89.9	0.2576	0.0000	OK
15 minute winter	192	11	130.613	0.113	95.4	0.2716	0.0000	OK
15 minute winter	193	12	130.210	0.260	163.1	0.7667	0.0000	OK
15 minute winter	194	12	129.584	0.184	163.4	0.0000	0.0000	OK
15 minute winter	195	10	130.156	0.056	9.9	0.1384	0.0000	OK
15 minute winter	196	10	129.636	0.061	13.5	0.1267	0.0000	OK
15 minute winter	197	13	129.463	0.213	173.2	0.0000	0.0000	OK
15 minute winter	198	10	129.485	0.060	17.8	0.2220	0.0000	OK
15 minute winter	199	10	128.808	0.083	24.9	0.2486	0.0000	OK
15 minute winter	200	13	128.692	0.167	188.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	176	34.016	179	63.8	0.405	0.002	7.5686	
15 minute winter	177	38.000	178	9.7	0.961	0.186	0.0749	
15 minute winter	178	38.001	179	12.8	0.875	0.045	0.2756	
15 minute winter	179	34.017	193	72.8	1.000	0.085	1.5353	
15 minute winter	180	39.000	181	19.2	1.512	0.122	0.6717	
15 minute winter	181	39.001	182	28.7	1.653	0.055	0.1190	
15 minute winter	182	39.002	185	28.8	1.664	0.055	0.8068	
15 minute winter	183	40.000	184	9.8	1.018	0.165	0.0369	
15 minute winter	184	40.001	185	15.0	1.001	0.144	0.1282	
15 minute winter	185	39.003	190	43.8	2.374	0.066	0.8205	
15 minute winter	186	41.000	187	9.7	1.269	0.058	0.1117	
15 minute winter	187	41.001	190	13.0	0.913	0.076	0.2908	
15 minute winter	188	42.000	189	19.7	2.311	0.059	0.0267	
15 minute winter	189	42.001	190	26.9	1.957	0.041	0.1161	
15 minute winter	190	39.004	191	85.2	2.174	0.090	1.7227	
15 minute winter	191	39.005	192	89.8	2.560	0.073	1.7951	
15 minute winter	192	39.006	193	95.5	2.584	0.049	0.3472	
15 minute winter	193	34.018	194	163.4	1.414	0.202	2.7885	
15 minute winter	194	34.019	197	161.8	0.541	0.011	8.1490	
15 minute winter	195	43.000	196	9.7	1.281	0.129	0.1372	
15 minute winter	196	43.001	197	13.3	1.179	0.055	0.1922	
15 minute winter	197	Head/Flow	200	170.4				
15 minute winter	198	44.000	199	17.5	1.580	0.053	0.2239	
15 minute winter	199	44.001	200	24.7	1.105	0.053	0.4399	
15 minute winter	200	34.021	201	188.1	0.683	0.009	13.0144	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	14	128.196	0.195	188.1	0.0000	0.0000	OK
15 minute winter	202	15	127.892	0.267	183.2	0.0000	0.0000	OK
15 minute winter	203	10	136.248	0.048	11.4	0.1265	0.0000	OK
15 minute winter	204	10	134.554	0.079	9.9	0.1996	0.0000	OK
15 minute winter	205	10	134.425	0.075	11.2	0.0989	0.0000	OK
15 minute winter	206	11	134.207	0.056	24.2	0.0939	0.0000	OK
15 minute winter	207	11	132.477	0.077	33.4	0.1988	0.0000	OK
15 minute winter	208	11	132.204	0.079	34.2	0.1225	0.0000	OK
15 minute winter	209	11	131.941	0.091	43.6	0.2370	0.0000	OK
15 minute winter	210	10	131.505	0.055	16.8	0.1798	0.0000	OK
15 minute winter	211	11	130.779	0.104	61.9	0.2050	0.0000	OK
15 minute winter	212	11	130.000	0.100	64.0	0.1974	0.0000	OK
15 minute winter	213	10	130.051	0.051	5.9	0.1004	0.0000	OK
15 minute winter	214	11	129.575	0.125	71.7	0.2468	0.0000	OK
15 minute winter	215	10	134.612	0.037	7.9	0.0831	0.0000	OK
15 minute winter	216	10	133.895	0.045	9.8	0.0629	0.0000	OK
15 minute winter	217	10	132.587	0.062	9.9	0.1519	0.0000	OK
15 minute winter	218	10	132.414	0.064	21.3	0.1064	0.0000	OK
15 minute winter	219	10	133.167	0.042	6.4	0.0852	0.0000	OK
15 minute winter	220	11	132.188	0.088	57.2	0.4406	0.0000	OK
15 minute winter	221	11	129.003	0.178	135.9	0.6321	0.0000	OK
15 minute winter	222	11	128.603	0.152	145.2	0.5255	0.0000	OK
15 minute winter	223	10	128.888	0.038	9.9	0.0907	0.0000	OK
15 minute winter	224	10	128.370	0.045	14.8	0.0927	0.0000	OK
15 minute winter	225	13	127.397	0.272	286.6	0.6739	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	34.022	202	183.2	0.566	0.012	24.6132	
15 minute winter	202	34.023	225	174.3	1.354	0.312	0.8017	
15 minute winter	203	45.000	206	11.1	1.852	0.095	0.2187	
15 minute winter	204	46.000	205	9.7	0.828	0.229	0.0879	
15 minute winter	205	46.001	206	11.1	0.864	0.116	0.0874	
15 minute winter	206	45.001	207	24.0	1.641	0.034	0.5562	
15 minute winter	207	45.002	208	33.3	1.813	0.055	0.1453	
15 minute winter	208	45.003	209	34.3	1.652	0.060	0.1813	
15 minute winter	209	45.004	211	43.9	1.954	0.087	0.9574	
15 minute winter	210	47.000	211	16.7	1.996	0.064	0.0731	
15 minute winter	211	45.005	212	62.1	1.976	0.062	1.0397	
15 minute winter	212	45.006	214	64.1	1.646	0.047	0.8224	
15 minute winter	213	48.000	214	5.8	0.897	0.102	0.0537	
15 minute winter	214	45.007	221	70.5	1.598	0.073	2.2883	
15 minute winter	215	49.000	216	7.8	1.606	0.058	0.0539	
15 minute winter	216	49.001	218	9.7	1.763	0.084	0.1505	
15 minute winter	217	50.000	218	9.7	0.977	0.083	0.0890	
15 minute winter	218	49.002	220	21.2	1.938	0.045	0.0349	
15 minute winter	219	51.000	220	6.3	1.244	0.074	0.1522	
15 minute winter	220	49.003	221	56.1	2.619	0.082	1.4484	
15 minute winter	221	45.008	222	135.8	1.897	0.112	2.8183	
15 minute winter	222	45.009	225	142.8	2.290	0.089	4.0617	
15 minute winter	223	52.000	224	9.8	1.998	0.030	0.0256	
15 minute winter	224	52.001	225	14.7	2.053	0.028	0.0616	
15 minute winter	225	34.024	226	285.6	1.705	0.162	4.3012	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	226	14	126.244	0.269	286.7	0.7912	0.0000	OK
15 minute winter	227	1	126.100	0.000	0.0	0.0000	0.0000	OK
15 minute winter	228	14	125.636	0.286	287.5	0.8751	0.0000	OK
15 minute winter	229	14	125.188	0.388	290.6	1.2506	0.0000	OK
15 minute winter	230	1	125.225	0.000	0.0	0.0000	0.0000	OK
15 minute winter	231	14	125.010	0.385	292.8	1.1736	0.0000	OK
15 minute winter	232	14	124.805	0.380	293.6	1.1170	0.0000	OK
15 minute winter	233	15	124.613	0.438	305.7	2.5983	0.0000	OK
15 minute winter	234	15	124.198	0.498	302.9	1.8320	0.0000	OK
1440 minute winter	235	1650	124.089	0.439	43.4	0.4872	0.0000	SURCHARGED
1440 minute winter	236	1680	124.089	0.539	43.1	1310.6370	0.0000	SURCHARGED
1440 minute winter	237	1650	124.088	0.613	4.9	1.3481	0.0000	SURCHARGED
15 minute winter	238	10	123.585	0.035	5.4	0.0661	0.0000	OK
15 minute winter	239	11	122.274	0.049	12.8	0.1068	0.0000	OK
15 minute winter	240	10	128.296	0.046	7.9	0.1029	0.0000	OK
15 minute winter	241	11	126.951	0.051	11.6	0.0993	0.0000	OK
15 minute winter	242	11	126.449	0.074	15.3	0.1400	0.0000	OK
15 minute winter	243	10	127.702	0.027	3.3	0.0441	0.0000	OK
15 minute winter	244	10	127.204	0.029	3.3	0.0322	0.0000	OK
15 minute winter	245	11	126.357	0.107	22.7	0.2017	0.0000	OK
15 minute winter	246	11	126.139	0.064	27.0	0.1197	0.0000	OK
15 minute winter	247	11	125.176	0.076	45.5	0.2920	0.0000	OK
15 minute winter	248	10	123.978	0.028	4.0	0.0487	0.0000	OK
15 minute winter	249	10	123.510	0.035	5.0	0.0445	0.0000	OK
15 minute winter	250	11	122.693	0.093	52.0	0.1558	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	226	34.025	228	286.2	1.754	0.154	1.9535	
15 minute winter	227	53.000	228	0.0	0.000	0.000	0.0000	
15 minute winter	228	34.026	229	288.5	1.269	0.186	3.6294	
15 minute winter	229	34.027	231	291.5	1.063	0.304	3.6092	
15 minute winter	230	54.000	231	0.0	0.000	0.000	0.0000	
15 minute winter	231	34.028	232	292.8	1.083	0.301	3.9697	
15 minute winter	232	34.029	233	291.8	0.992	0.308	5.6933	
15 minute winter	233	34.030	234	301.6	1.148	0.373	6.9994	
15 minute winter	234	34.031	235	303.5	0.896	0.471	8.6224	
1440 minute winter	235	34.032	236	42.6	0.075	0.167	77.6970	
1440 minute winter	236	34.033	237	4.9	-0.190	0.042	0.4729	
1440 minute winter	237	Depth/Flow	239	4.9				
15 minute winter	238	55.000	239	5.3	1.364	0.051	0.1160	
15 minute winter	239	34.035	252	12.8	1.601	0.032	0.0492	
15 minute winter	240	56.000	241	7.7	1.331	0.090	0.2595	
15 minute winter	241	56.001	242	11.5	1.296	0.039	0.1836	
15 minute winter	242	56.002	245	15.2	0.676	0.060	0.4655	
15 minute winter	243	57.000	244	3.3	1.450	0.069	0.0160	
15 minute winter	244	57.001	245	3.2	1.415	0.075	0.0243	
15 minute winter	245	56.003	246	22.8	1.084	0.116	1.0022	
15 minute winter	246	56.004	247	26.8	1.714	0.045	0.4508	
15 minute winter	247	56.005	250	45.4	2.210	0.063	1.0521	
15 minute winter	248	58.000	249	4.0	1.471	0.077	0.0155	
15 minute winter	249	58.001	250	4.9	1.623	0.109	0.0276	
15 minute winter	250	56.006	251	52.0	1.968	0.086	0.3465	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	251	11	122.258	0.108	56.2	0.2131	0.0000	OK
15 minute winter	252	11	121.608	0.083	69.8	0.2197	0.0000	OK
15 minute winter	253	11	120.473	0.098	72.9	0.2818	0.0000	OK
15 minute winter	254	11	119.056	0.080	77.0	0.2445	0.0000	OK
15 minute winter	255	1	124.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	256	1	124.325	0.000	0.0	0.0000	0.0000	OK
15 minute winter	257	11	123.783	0.008	2.0	0.0031	0.0000	OK
15 minute winter	258	12	122.262	0.012	3.6	0.0047	0.0000	OK
15 minute winter	259	13	121.312	0.012	3.4	0.0000	0.0000	OK
15 minute winter	260	15	119.840	0.015	3.1	0.0000	0.0000	OK
180 minute winter	261	128	119.750	0.150	1.3	0.0000	0.0000	SURCHARGED
15 minute winter	262	10	119.176	0.076	9.9	0.1921	0.0000	OK
15 minute winter	263	10	119.127	0.077	9.7	0.0870	0.0000	OK
15 minute winter	264	11	118.530	0.155	87.8	0.4205	0.0000	OK
15 minute winter	265	12	118.415	0.140	90.0	0.3932	0.0000	OK
15 minute winter	266	10	119.604	0.054	9.9	0.1324	0.0000	OK
15 minute winter	267	10	118.693	0.092	18.5	0.2332	0.0000	OK
15 minute winter	268	11	118.258	0.108	113.1	0.3320	0.0000	OK
15 minute winter	269	11	117.430	0.130	115.3	0.3699	0.0000	OK
15 minute winter	270	12	117.063	0.113	117.1	0.3148	0.0000	OK
15 minute winter	271	12	115.969	0.119	121.7	0.3603	0.0000	OK
15 minute winter	272	12	114.434	0.159	134.2	0.7799	0.0000	OK
15 minute winter	273	10	115.521	0.046	7.9	0.0953	0.0000	OK
15 minute winter	274	10	115.087	0.062	11.0	0.1081	0.0000	OK
15 minute winter	275	12	114.298	0.173	145.6	0.6683	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	251	56.007	252	56.1	2.104	0.099	0.2198	
15 minute winter	252	34.036	253	69.7	2.213	0.022	0.9080	
15 minute winter	253	34.037	254	72.3	2.343	0.028	1.6453	
15 minute winter	254	34.038	264	76.3	1.647	0.021	0.5364	
15 minute winter	255	59.000	256	0.0	0.000	0.000	0.0005	
15 minute winter	256	59.001	257	0.0	0.000	0.000	0.0939	
15 minute winter	257	59.002	258	1.7	0.170	0.000	0.4264	
15 minute winter	258	59.003	259	3.4	0.295	0.000	0.2800	
15 minute winter	259	59.004	260	3.1	0.264	0.000	0.5874	
15 minute winter	260	59.005	261	2.6	0.160	0.000	1.2539	
180 minute winter	261	Depth/Flow	264	0.8				
15 minute winter	262	60.000	263	9.7	0.820	0.198	0.0665	
15 minute winter	263	60.001	264	9.6	0.837	0.228	0.1304	
15 minute winter	264	34.039	265	87.2	1.357	0.066	0.9316	
15 minute winter	265	34.040	268	90.1	1.800	0.051	0.5078	
15 minute winter	266	61.000	267	9.6	1.347	0.121	0.2217	
15 minute winter	267	61.001	268	18.3	0.809	0.087	0.3973	
15 minute winter	268	34.041	269	112.5	2.378	0.037	1.0756	
15 minute winter	269	34.042	270	115.2	2.370	0.045	0.6453	
15 minute winter	270	34.043	271	117.8	2.601	0.039	1.4084	
15 minute winter	271	34.044	272	122.6	2.702	0.042	1.5454	
15 minute winter	272	34.045	275	134.8	1.392	0.027	1.4618	
15 minute winter	273	62.000	274	7.8	1.399	0.081	0.0372	
15 minute winter	274	62.001	275	10.9	0.880	0.036	0.1056	
15 minute winter	275	34.046	276	146.8	1.368	0.037	3.8647	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	276	12	114.083	0.183	153.9	0.7912	0.0000	OK
15 minute winter	277	10	116.279	0.029	5.0	0.0525	0.0000	OK
15 minute winter	278	10	115.855	0.029	6.0	0.0364	0.0000	OK
15 minute winter	279	12	113.934	0.159	160.5	0.6110	0.0000	OK
15 minute winter	280	12	113.726	0.201	271.5	0.8106	0.0000	OK
15 minute winter	281	12	113.220	0.145	274.3	0.5745	0.0000	OK
15 minute winter	282	10	115.211	0.036	5.0	0.0658	0.0000	OK
15 minute winter	283	10	114.858	0.033	5.9	0.0418	0.0000	OK
15 minute winter	284	10	113.947	0.047	7.9	0.0640	0.0000	OK
15 minute winter	285	10	113.774	0.074	11.5	0.1158	0.0000	OK
15 minute winter	286	11	113.585	0.060	13.3	0.0836	0.0000	OK
15 minute winter	287	12	112.076	0.226	289.8	0.9206	0.0000	OK
15 minute winter	288	12	111.845	0.245	294.4	1.0586	0.0000	OK
15 minute winter	289	13	111.706	0.231	292.5	0.7990	0.0000	OK
15 minute winter	290	10	114.003	0.053	12.6	0.1433	0.0000	OK
15 minute winter	291	10	113.008	0.058	19.7	0.1355	0.0000	OK
15 minute winter	292	13	111.238	0.188	309.9	0.8998	0.0000	OK
15 minute winter	293	10	112.144	0.044	6.9	0.0916	0.0000	OK
15 minute winter	294	10	112.029	0.054	7.8	0.0686	0.0000	OK
15 minute winter	295	13	110.954	0.354	318.0	1.6435	0.0000	OK
15 minute winter	296	13	110.930	0.355	317.0	0.0000	0.0000	OK
15 minute winter	297	10	111.633	0.033	4.5	0.0542	0.0000	OK
15 minute winter	298	10	111.347	0.022	4.5	0.0245	0.0000	OK
15 minute winter	299	15	110.680	0.230	315.2	0.0000	0.0000	OK
15 minute winter	300	10	124.998	0.023	2.5	0.0342	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	276	34.047	279	154.0	1.524	0.039	2.0231	
15 minute winter	277	63.000	278	5.0	1.405	0.019	0.0265	
15 minute winter	278	63.001	279	5.9	1.684	0.019	0.0506	
15 minute winter	279	34.048	280	160.1	1.484	0.029	2.2259	
15 minute winter	280	1.037	281	271.6	2.635	0.046	3.3190	
15 minute winter	281	1.038	287	273.3	2.391	0.029	4.0280	
15 minute winter	282	64.000	283	4.9	1.297	0.051	0.0383	
15 minute winter	283	64.001	284	5.9	1.673	0.044	0.0452	
15 minute winter	284	64.002	285	7.8	0.774	0.053	0.1163	
15 minute winter	285	64.003	286	11.4	0.974	0.125	0.3026	
15 minute winter	286	64.004	287	13.3	1.337	0.087	0.3663	
15 minute winter	287	1.039	288	287.8	1.790	0.057	3.9095	
15 minute winter	288	1.040	289	292.5	1.858	0.064	1.6682	
15 minute winter	289	1.041	292	294.1	2.269	0.055	1.0066	
15 minute winter	290	65.000	291	12.3	1.509	0.065	0.2607	
15 minute winter	291	65.001	292	19.4	1.843	0.049	0.2122	
15 minute winter	292	1.042	295	311.7	1.478	0.030	5.3460	
15 minute winter	293	66.000	294	6.8	1.080	0.071	0.0232	
15 minute winter	294	66.001	295	7.8	1.128	0.106	0.0351	
15 minute winter	295	1.043	296	317.0	1.103	0.093	3.8979	
15 minute winter	296	1.044	299	313.2	0.582	0.035	34.7892	
15 minute winter	297	67.000	298	4.5	1.410	0.021	0.0240	
15 minute winter	298	67.001	299	4.4	2.348	0.010	0.1788	
15 minute winter	299	1.045	325	302.0	0.626	0.016	14.1832	
15 minute winter	300	68.000	301	2.5	0.790	0.022	0.0590	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	124.162	0.037	6.5	0.0618	0.0000	OK
15 minute winter	302	10	123.536	0.036	6.4	0.0407	0.0000	OK
15 minute winter	303	10	122.655	0.055	13.6	0.1308	0.0000	OK
15 minute winter	304	11	122.297	0.097	21.3	0.2322	0.0000	OK
15 minute winter	305	11	122.119	0.119	29.6	0.2784	0.0000	OK
15 minute winter	306	10	128.496	0.046	5.9	0.0909	0.0000	OK
15 minute winter	307	10	128.142	0.042	7.0	0.0544	0.0000	OK
15 minute winter	308	11	127.544	0.044	8.4	0.0588	0.0000	OK
15 minute winter	309	10	126.990	0.040	3.0	0.0619	0.0000	OK
15 minute winter	310	11	126.890	0.065	12.7	0.0861	0.0000	OK
15 minute winter	311	10	126.903	0.028	4.0	0.0471	0.0000	OK
15 minute winter	312	10	126.638	0.038	6.6	0.0557	0.0000	OK
15 minute winter	313	11	126.229	0.054	21.7	0.0827	0.0000	OK
15 minute winter	314	10	124.161	0.036	5.0	0.0676	0.0000	OK
15 minute winter	315	10	123.508	0.033	7.9	0.0514	0.0000	OK
15 minute winter	316	11	121.887	0.087	64.1	0.1632	0.0000	OK
15 minute winter	317	11	120.062	0.112	63.9	0.1597	0.0000	OK
15 minute winter	318	11	119.718	0.068	63.6	0.0000	0.0000	OK
15 minute winter	319	11	119.543	0.068	63.5	0.0000	0.0000	OK
15 minute winter	320	12	119.056	0.106	62.9	0.0000	0.0000	OK
15 minute winter	321	12	117.959	0.059	63.3	0.0000	0.0000	OK
15 minute winter	322	13	116.657	0.107	63.4	0.0000	0.0000	OK
15 minute winter	323	13	114.878	0.103	61.6	0.0000	0.0000	OK
15 minute winter	324	13	112.881	0.106	61.7	0.0000	0.0000	OK
15 minute winter	325	14	110.505	0.305	357.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	68.001	302	6.4	1.537	0.054	0.0518	
15 minute winter	302	68.002	303	6.2	1.563	0.053	0.0585	
15 minute winter	303	68.003	304	13.4	1.386	0.043	0.1321	
15 minute winter	304	68.004	305	21.1	0.737	0.105	1.5090	
15 minute winter	305	68.005	316	29.1	1.074	0.144	1.3972	
15 minute winter	306	69.000	307	5.8	1.065	0.087	0.1158	
15 minute winter	307	69.001	308	6.9	1.318	0.074	0.0985	
15 minute winter	308	69.002	310	8.4	1.151	0.084	0.1384	
15 minute winter	309	70.000	310	2.9	0.426	0.070	0.1353	
15 minute winter	310	69.003	313	12.7	1.368	0.174	0.2727	
15 minute winter	311	71.000	312	4.0	0.948	0.019	0.0316	
15 minute winter	312	71.001	313	6.5	0.978	0.034	0.0985	
15 minute winter	313	69.004	316	21.8	2.553	0.070	0.4632	
15 minute winter	314	72.000	315	4.9	1.626	0.116	0.0350	
15 minute winter	315	72.001	316	7.9	2.901	0.094	0.0169	
15 minute winter	316	68.006	317	63.9	2.462	0.085	0.8917	
15 minute winter	317	68.007	318	63.6	2.843	0.116	0.2382	
15 minute winter	318	68.008	319	63.5	0.781	0.005	0.4205	
15 minute winter	319	68.009	320	62.9	0.612	0.004	1.7165	
15 minute winter	320	Head/Flow	321	63.3				
15 minute winter	321	68.011	322	63.4	0.664	0.004	2.5426	
15 minute winter	322	Head/Flow	323	61.6				
15 minute winter	323	Head/Flow	324	61.7				
15 minute winter	324	Head/Flow	325	61.7				
15 minute winter	325	1.046	326	356.0	0.780	0.125	14.4385	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	15	110.343	0.343	356.0	3.2044	0.0000	OK
15 minute winter	327	16	110.004	0.429	374.6	4.0107	0.0000	OK
15 minute winter	328	17	109.748	0.348	349.8	0.0000	0.0000	SURCHARGED
15 minute winter	329	20	109.532	0.307	368.7	0.0000	0.0000	SURCHARGED
15 minute winter	330	22	109.402	0.302	322.2	0.0000	0.0000	SURCHARGED
1440 minute winter	331	1680	109.334	0.384	42.9	0.0000	0.0000	SURCHARGED
1440 minute winter	332	1680	109.334	0.484	41.9	1207.7150	0.0000	SURCHARGED
1440 minute winter	333	1680	109.333	0.533	5.1	0.6029	0.0000	SURCHARGED
15 minute winter	334	1	107.370	0.000	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	1.047	327	374.6	0.735	0.144	32.4049	
15 minute winter	327	1.048	328	349.8	1.214	0.210	8.4216	
15 minute winter	328	1.049	329	368.7	0.573	1.189	58.4123	
15 minute winter	329	1.050	330	322.2	0.558	1.022	37.5477	
15 minute winter	330	1.051	331	290.2	0.522	0.935	42.4718	
1440 minute winter	331	1.052	332	41.9	0.073	0.131	51.6131	
1440 minute winter	332	1.053	333	5.1	0.072	0.091	1.3715	
1440 minute winter	333	Depth/Flow	334	5.1				398.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	141.716	0.041	4.7	0.0630	0.0000	OK
15 minute winter	2	10	141.564	0.139	41.5	0.5559	0.0000	OK
15 minute winter	3	10	142.191	0.066	19.1	0.1763	0.0000	OK
15 minute winter	4	11	141.393	0.143	63.8	0.2399	0.0000	OK
15 minute winter	5	10	141.301	0.101	20.6	0.2953	0.0000	OK
15 minute winter	6	10	140.918	0.093	20.3	0.1639	0.0000	OK
15 minute winter	7	11	140.897	0.197	93.7	0.4842	0.0000	OK
15 minute winter	8	11	140.837	0.162	99.3	0.3430	0.0000	OK
15 minute winter	9	10	140.816	0.066	16.1	0.1601	0.0000	OK
15 minute winter	10	11	140.215	0.115	118.7	0.2342	0.0000	OK
30 minute winter	11	22	139.017	0.042	4.8	1.7480	0.0000	OK
15 minute winter	12	10	140.054	0.054	15.8	0.1400	0.0000	OK
15 minute winter	13	10	139.573	0.048	20.8	0.0861	0.0000	OK
15 minute winter	14	11	138.363	0.088	25.8	0.2387	0.0000	OK
15 minute winter	15	10	139.281	0.055	21.5	0.1659	0.0000	OK
15 minute winter	16	11	138.220	0.145	61.2	0.4523	0.0000	OK
15 minute winter	17	12	138.060	0.210	81.4	0.6968	0.0000	OK
15 minute winter	18	12	138.039	0.213	78.4	0.5501	0.0000	OK
15 minute winter	19	12	138.018	0.243	198.7	0.6638	0.0000	OK
15 minute winter	20	10	140.133	0.058	6.3	0.0998	0.0000	OK
15 minute winter	21	10	139.957	0.032	6.2	0.0357	0.0000	OK
15 minute winter	22	12	139.010	0.035	6.2	0.0000	0.0000	OK
15 minute winter	23	11	138.921	0.046	15.0	0.0603	0.0000	OK
15 minute winter	24	12	137.922	0.322	214.9	0.8338	0.0000	OK
15 minute winter	25	12	137.822	0.297	222.5	0.8353	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	4.7	0.827	0.037	0.0446	
15 minute winter	2	1.001	4	40.7	0.975	0.195	1.7475	
15 minute winter	3	2.000	4	18.8	1.671	0.101	0.2954	
15 minute winter	4	1.002	7	63.6	1.512	0.208	1.8890	
15 minute winter	5	3.000	6	20.3	1.296	0.322	0.0800	
15 minute winter	6	3.001	7	20.1	0.733	0.053	0.2569	
15 minute winter	7	1.003	8	93.9	1.327	0.209	0.4147	
15 minute winter	8	1.004	10	99.6	2.028	0.143	2.7769	
15 minute winter	9	4.000	10	15.9	1.430	0.098	0.1845	
15 minute winter	10	1.005	19	118.0	3.205	0.078	1.6584	
30 minute winter	11	5.000	14	3.0	0.595	0.075	0.1468	
15 minute winter	12	6.000	13	15.7	1.593	0.028	0.1591	
15 minute winter	13	6.001	14	20.6	2.376	0.022	0.0983	
15 minute winter	14	5.001	16	25.8	0.601	0.030	1.8339	
15 minute winter	15	7.000	16	21.2	1.952	0.031	0.2039	
15 minute winter	16	5.002	17	59.8	0.777	0.086	5.5719	
15 minute winter	17	5.003	18	77.7	0.768	0.100	0.6366	
15 minute winter	18	5.004	19	79.3	0.731	0.118	1.8871	
15 minute winter	19	1.006	24	199.7	1.318	0.154	2.4104	
15 minute winter	20	8.000	21	6.2	1.410	0.253	0.0355	
15 minute winter	21	8.001	22	6.2	2.493	0.092	0.0187	
15 minute winter	22	8.002	23	5.5	0.120	0.001	1.8615	
15 minute winter	23	8.003	24	14.3	2.498	0.087	0.0438	
15 minute winter	24	1.007	25	216.8	1.266	0.337	4.6943	
15 minute winter	25	1.008	26	223.0	2.074	0.361	4.3861	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	12	137.569	0.144	228.3	0.4067	0.0000	OK
15 minute winter	27	10	138.502	0.027	4.7	0.0419	0.0000	OK
15 minute winter	28	12	137.105	0.355	238.4	1.0125	0.0000	OK
15 minute winter	29	13	136.994	0.344	246.8	1.0731	0.0000	OK
15 minute winter	30	13	136.847	0.297	251.8	0.8535	0.0000	OK
15 minute winter	31	10	137.315	0.064	10.3	0.1215	0.0000	OK
15 minute winter	32	10	137.148	0.073	14.2	0.1026	0.0000	OK
15 minute winter	33	13	136.698	0.248	264.4	0.6806	0.0000	OK
15 minute winter	34	13	136.059	0.159	268.8	0.4635	0.0000	OK
15 minute winter	35	11	138.356	0.056	7.4	0.0982	0.0000	OK
15 minute winter	36	10	138.470	0.045	6.3	0.0742	0.0000	OK
15 minute winter	37	11	137.984	0.084	27.4	0.1944	0.0000	OK
15 minute winter	38	11	137.541	0.066	27.6	0.0981	0.0000	OK
15 minute winter	39	11	136.440	0.090	35.0	0.1742	0.0000	OK
15 minute winter	40	10	136.654	0.054	10.0	0.1017	0.0000	OK
15 minute winter	41	10	136.421	0.071	19.9	0.1494	0.0000	OK
15 minute winter	42	11	136.264	0.089	19.8	0.1576	0.0000	OK
15 minute winter	43	11	135.899	0.124	54.6	0.3160	0.0000	OK
15 minute winter	44	10	137.021	0.046	4.7	0.0724	0.0000	OK
15 minute winter	45	10	136.850	0.025	4.7	0.0282	0.0000	OK
15 minute winter	46	12	135.503	0.153	57.3	0.3890	0.0000	OK
15 minute winter	47	10	136.649	0.049	11.9	0.0980	0.0000	OK
15 minute winter	48	10	136.251	0.051	17.2	0.0742	0.0000	OK
15 minute winter	49	14	135.457	0.182	71.8	0.4632	0.0000	OK
15 minute winter	50	13	135.451	0.276	80.4	0.8435	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	26	1.009	28	227.8	1.785	0.070	1.2902	
15 minute winter	27	9.000	28	4.7	1.766	0.029	0.0341	
15 minute winter	28	1.010	29	235.7	1.178	0.398	8.6471	
15 minute winter	29	1.011	30	247.8	1.381	0.419	7.7609	
15 minute winter	30	1.012	33	252.7	1.749	0.293	2.9522	
15 minute winter	31	10.000	32	10.2	1.160	0.150	0.0514	
15 minute winter	32	10.001	33	14.0	1.099	0.118	0.1968	
15 minute winter	33	1.013	34	264.6	2.744	0.202	4.7905	
15 minute winter	34	1.014	54	268.2	2.387	0.088	1.4248	
15 minute winter	35	11.000	37	7.1	0.576	0.078	0.7297	
15 minute winter	36	12.000	37	6.2	0.565	0.049	0.4564	
15 minute winter	37	11.001	38	27.0	1.758	0.152	0.2108	
15 minute winter	38	11.002	39	27.6	2.166	0.065	0.2951	
15 minute winter	39	11.003	43	35.1	1.651	0.077	0.2959	
15 minute winter	40	13.000	41	9.9	1.234	0.058	0.0341	
15 minute winter	41	13.001	42	19.8	1.340	0.043	0.0743	
15 minute winter	42	13.002	43	19.5	0.818	0.062	0.9880	
15 minute winter	43	11.004	46	53.3	1.138	0.060	3.1483	
15 minute winter	44	14.000	45	4.7	1.465	0.157	0.0176	
15 minute winter	45	14.001	46	4.6	2.556	0.052	0.0058	
15 minute winter	46	11.005	49	57.9	0.783	0.068	1.9056	
15 minute winter	47	15.000	48	11.8	1.988	0.086	0.0278	
15 minute winter	48	15.001	49	17.1	2.377	0.049	0.0299	
15 minute winter	49	11.006	50	69.6	0.766	0.088	4.8465	
15 minute winter	50	11.007	53	67.3	0.681	0.083	3.2831	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	51	10	136.947	0.047	4.0	0.0703	0.0000	OK
15 minute winter	52	10	136.825	0.025	3.9	0.0281	0.0000	OK
15 minute winter	53	13	135.447	0.322	70.6	0.8199	0.0000	OK
15 minute winter	54	13	135.445	0.370	338.6	1.0161	0.0000	OK
15 minute winter	55	14	135.241	0.241	340.7	0.7141	0.0000	OK
15 minute winter	56	14	134.931	0.406	343.4	1.1371	0.0000	OK
15 minute winter	57	14	134.854	0.354	345.4	0.9311	0.0000	OK
15 minute winter	58	14	134.695	0.220	348.1	0.6235	0.0000	OK
15 minute winter	59	14	133.257	0.282	353.5	0.8707	0.0000	OK
15 minute winter	60	10	134.026	0.076	15.0	0.1861	0.0000	OK
15 minute winter	61	10	133.799	0.049	14.8	0.0552	0.0000	OK
15 minute winter	62	15	133.022	0.222	358.7	0.0000	0.0000	OK
15 minute winter	63	10	133.501	0.051	6.5	0.0867	0.0000	OK
15 minute winter	64	10	133.406	0.056	9.6	0.0790	0.0000	OK
15 minute winter	65	15	132.381	0.281	357.3	0.0000	0.0000	OK
15 minute winter	66	10	132.954	0.078	12.7	0.1603	0.0000	OK
15 minute winter	67	10	132.761	0.086	17.2	0.1226	0.0000	OK
15 minute winter	68	10	132.660	0.085	21.0	0.1187	0.0000	OK
15 minute winter	69	10	132.453	0.052	20.9	0.0594	0.0000	OK
1440 minute winter	70	1500	131.569	0.344	29.6	0.0000	0.0000	OK
1440 minute winter	71	1500	131.569	0.419	29.6	0.0000	0.0000	SURCHARGED
1440 minute winter	72	1500	131.569	0.544	28.8	909.6186	0.0000	SURCHARGED
1440 minute winter	73	1500	131.569	0.594	0.9	0.6722	0.0000	SURCHARGED
15 minute winter	74	10	130.857	0.032	6.6	0.0636	0.0000	OK
15 minute winter	75	10	129.971	0.046	7.9	0.0830	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	51	16.000	52	3.9	1.222	0.167	0.0187	
15 minute winter	52	16.001	53	3.9	2.105	0.055	0.0118	
15 minute winter	53	11.008	54	68.9	0.420	0.073	3.0087	
15 minute winter	54	1.015	55	336.1	1.887	0.500	7.4545	
15 minute winter	55	1.016	56	341.4	1.762	0.148	4.4277	
15 minute winter	56	1.017	57	344.8	1.438	0.394	1.9602	
15 minute winter	57	1.018	58	345.9	2.105	0.420	1.5289	
15 minute winter	58	1.019	59	349.4	2.554	0.163	11.3646	
15 minute winter	59	1.020	62	351.8	2.567	0.244	2.9021	
15 minute winter	60	17.000	61	14.8	1.350	0.202	0.0695	
15 minute winter	61	17.001	62	14.8	2.039	0.054	0.0511	
15 minute winter	62	1.021	65	354.1	0.917	0.015	22.7657	
15 minute winter	63	18.000	64	6.4	0.891	0.100	0.0473	
15 minute winter	64	18.001	65	9.5	1.264	0.128	0.0651	
15 minute winter	65	Head/Flow	70	346.4				
15 minute winter	66	19.000	67	12.5	1.061	0.233	0.1385	
15 minute winter	67	19.001	68	17.0	1.027	0.157	0.1736	
15 minute winter	68	19.002	69	20.9	1.712	0.140	0.1213	
15 minute winter	69	19.003	70	20.8	2.592	0.062	0.0583	
1440 minute winter	70	1.023	71	29.6	0.547	0.024	3.0322	
1440 minute winter	71	1.024	72	28.8	0.101	0.138	75.6409	
1440 minute winter	72	1.025	73	0.9	0.200	0.019	1.7184	
1440 minute winter	73	Depth/Flow	74	0.6				
15 minute winter	74	1.027	78	6.6	1.129	0.015	0.2532	
15 minute winter	75	20.000	76	7.8	1.191	0.046	0.0493	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	76	10	129.794	0.043	7.8	0.0492	0.0000	OK
15 minute winter	77	10	129.565	0.039	7.8	0.0446	0.0000	OK
15 minute winter	78	11	128.894	0.044	18.2	0.0749	0.0000	OK
15 minute winter	79	11	135.674	0.049	7.6	0.0889	0.0000	OK
15 minute winter	80	11	134.679	0.079	16.3	0.1508	0.0000	OK
15 minute winter	81	11	134.307	0.082	25.7	0.1824	0.0000	OK
15 minute winter	82	11	133.499	0.124	37.9	0.3070	0.0000	OK
15 minute winter	83	11	133.221	0.121	53.6	0.3313	0.0000	OK
15 minute winter	84	11	132.703	0.103	64.0	0.2349	0.0000	OK
15 minute winter	85	11	131.239	0.164	63.3	0.2890	0.0000	OK
15 minute winter	86	12	131.016	0.166	63.2	0.2926	0.0000	OK
15 minute winter	87	12	130.897	0.147	63.4	0.2603	0.0000	OK
15 minute winter	88	10	134.337	0.062	12.8	0.1414	0.0000	OK
15 minute winter	89	10	134.217	0.092	16.7	0.1362	0.0000	OK
15 minute winter	90	11	134.087	0.037	16.6	0.0000	0.0000	OK
15 minute winter	91	12	133.255	0.055	16.2	0.0000	0.0000	OK
15 minute winter	92	12	132.367	0.067	15.2	0.0757	0.0000	OK
15 minute winter	93	10	132.786	0.036	6.3	0.0601	0.0000	OK
15 minute winter	94	10	132.287	0.036	6.3	0.0412	0.0000	OK
15 minute winter	95	12	131.784	0.109	20.4	0.1236	0.0000	OK
15 minute winter	96	1	133.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	97	1	132.575	0.000	0.0	0.0000	0.0000	OK
15 minute winter	98	12	131.654	0.029	20.4	0.0000	0.0000	OK
15 minute winter	99	13	130.620	0.195	90.0	0.2218	0.0000	OK
15 minute winter	100	13	130.544	0.168	88.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	76	20.001	77	7.8	1.325	0.040	0.0440	
15 minute winter	77	20.002	78	7.7	1.436	0.035	0.0847	
15 minute winter	78	1.028	119	18.0	2.575	0.028	0.1175	
15 minute winter	79	21.000	80	7.3	1.141	0.105	0.3392	
15 minute winter	80	21.001	81	16.1	1.110	0.147	0.4448	
15 minute winter	81	21.002	82	25.7	1.056	0.107	1.4565	
15 minute winter	82	21.003	83	37.7	1.229	0.219	0.8268	
15 minute winter	83	21.004	84	53.5	1.737	0.147	1.2169	
15 minute winter	84	21.005	85	63.3	2.371	0.111	1.2513	
15 minute winter	85	21.006	86	63.2	1.102	0.203	3.1239	
15 minute winter	86	21.007	87	63.4	1.176	0.199	1.2454	
15 minute winter	87	21.008	99	63.0	1.337	0.155	0.3329	
15 minute winter	88	22.000	89	12.7	1.054	0.142	0.0621	
15 minute winter	89	22.001	90	16.6	1.781	0.345	0.0853	
15 minute winter	90	22.002	91	16.2	0.334	0.002	2.4979	
15 minute winter	91	22.003	92	15.2	1.755	0.132	0.1606	
15 minute winter	92	22.004	95	15.1	1.053	0.195	0.4065	
15 minute winter	93	23.000	94	6.3	1.528	0.052	0.0381	
15 minute winter	94	23.001	95	6.2	0.895	0.057	0.1516	
15 minute winter	95	22.005	98	20.4	1.970	0.484	0.0839	
15 minute winter	96	24.000	97	0.0	0.000	0.000	0.0022	
15 minute winter	97	24.001	98	0.0	0.000	0.000	0.3095	
15 minute winter	98	22.006	99	20.0	0.136	0.001	3.2995	
15 minute winter	99	21.009	100	88.1	1.263	0.252	1.3804	
15 minute winter	100	21.010	101	88.0	0.419	0.028	3.3850	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	13	130.491	0.141	88.0	0.0000	0.0000	OK
15 minute winter	102	13	130.448	0.123	86.3	0.0000	0.0000	OK
15 minute winter	103	14	130.454	0.154	86.2	0.0000	0.0000	OK
15 minute winter	104	14	130.408	0.133	86.2	0.0000	0.0000	OK
15 minute winter	105	14	130.341	0.091	86.6	0.0000	0.0000	OK
15 minute winter	106	10	130.264	0.063	10.8	0.1324	0.0000	OK
15 minute winter	107	10	130.146	0.071	10.7	0.0804	0.0000	OK
15 minute winter	108	14	130.103	0.153	91.9	0.0000	0.0000	OK
15 minute winter	109	14	129.676	0.076	91.6	0.0000	0.0000	OK
15 minute winter	110	15	128.299	0.149	91.2	0.0000	0.0000	OK
15 minute winter	111	15	127.730	0.080	89.5	0.0000	0.0000	OK
15 minute winter	112	10	127.613	0.038	9.5	0.0753	0.0000	OK
15 minute winter	113	10	127.363	0.088	12.6	0.1237	0.0000	OK
15 minute winter	114	15	127.260	0.185	93.6	0.0000	0.0000	OK
15 minute winter	115	16	127.245	0.195	92.4	0.0000	0.0000	OK
15 minute winter	116	16	127.235	0.210	91.4	0.0000	0.0000	OK
15 minute winter	117	17	127.226	0.226	90.3	0.0000	0.0000	OK
15 minute winter	118	17	127.223	0.248	89.1	0.0000	0.0000	OK
15 minute winter	119	16	126.979	0.129	94.0	0.2497	0.0000	OK
15 minute winter	120	17	125.796	0.096	94.4	0.1927	0.0000	OK
15 minute winter	121	17	123.069	0.094	94.9	0.1797	0.0000	OK
15 minute winter	122	10	121.405	0.055	4.7	0.0856	0.0000	OK
15 minute winter	123	11	121.329	0.054	4.7	0.0606	0.0000	OK
15 minute winter	124	17	120.829	0.129	96.3	0.2417	0.0000	OK
15 minute winter	125	10	120.613	0.063	6.6	0.1102	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	Head/Flow	102	86.3				
15 minute winter	102	Depth/Flow	103	86.2				
15 minute winter	103	21.013	104	86.2	0.429	0.023	2.0601	
15 minute winter	104	Depth/Flow	105	86.6				
15 minute winter	105	21.015	108	86.7	0.526	0.008	2.2943	
15 minute winter	106	25.000	107	10.7	1.073	0.150	0.0669	
15 minute winter	107	25.001	108	10.6	1.024	0.195	0.0476	
15 minute winter	108	Depth/Flow	109	91.6				
15 minute winter	109	21.017	110	91.2	0.733	0.006	4.8386	
15 minute winter	110	Depth/Flow	111	89.5				
15 minute winter	111	21.019	114	89.4	0.497	0.006	2.9908	
15 minute winter	112	26.000	113	9.4	1.040	0.063	0.0348	
15 minute winter	113	26.001	114	12.5	0.898	0.300	0.1082	
15 minute winter	114	Depth/Flow	115	92.4				
15 minute winter	115	21.021	116	91.4	0.310	0.021	2.5683	
15 minute winter	116	21.022	117	90.3	0.254	0.024	3.7891	
15 minute winter	117	21.023	118	89.1	0.220	0.019	2.5788	
15 minute winter	118	21.024	119	88.7	1.174	0.395	0.9898	
15 minute winter	119	1.029	120	93.7	2.574	0.091	1.8828	
15 minute winter	120	1.030	121	94.5	3.303	0.054	1.2207	
15 minute winter	121	1.031	124	95.1	2.641	0.056	1.3492	
15 minute winter	122	27.000	123	4.7	0.815	0.250	0.0391	
15 minute winter	123	27.001	124	4.6	0.839	0.254	0.0660	
15 minute winter	124	1.032	126	96.6	2.244	0.094	1.3616	
15 minute winter	125	28.000	126	6.5	0.973	0.324	0.0525	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	126	23	120.124	0.124	99.2	0.2550	0.0000	OK
30 minute winter	127	23	119.209	0.109	101.7	0.2254	0.0000	OK
15 minute winter	128	10	121.943	0.043	4.9	0.0679	0.0000	OK
15 minute winter	129	10	121.824	0.049	4.8	0.0556	0.0000	OK
15 minute winter	130	10	121.739	0.014	4.8	0.0000	0.0000	OK
15 minute winter	131	11	121.590	0.015	4.8	0.0000	0.0000	OK
15 minute winter	132	11	121.191	0.016	4.8	0.0000	0.0000	OK
15 minute winter	133	11	120.993	0.018	9.4	0.0114	0.0000	OK
15 minute winter	134	11	120.621	0.021	9.4	0.0000	0.0000	OK
15 minute winter	135	11	120.070	0.020	9.5	0.0000	0.0000	OK
15 minute winter	136	10	120.898	0.023	4.0	0.0337	0.0000	OK
15 minute winter	137	10	120.200	0.025	4.0	0.0277	0.0000	OK
15 minute winter	138	11	119.704	0.029	13.2	0.0000	0.0000	OK
15 minute winter	139	12	119.556	0.081	13.2	0.0000	0.0000	OK
15 minute winter	140	10	120.551	0.051	15.8	0.1260	0.0000	OK
15 minute winter	141	10	120.147	0.047	15.7	0.0536	0.0000	OK
15 minute winter	142	10	119.638	0.063	19.6	0.0924	0.0000	OK
15 minute winter	143	10	118.623	0.073	25.7	0.1114	0.0000	OK
15 minute winter	144	10	118.779	0.054	13.4	0.1038	0.0000	OK
15 minute winter	145	10	118.179	0.054	14.9	0.0651	0.0000	OK
30 minute winter	146	21	117.600	0.150	137.6	0.3710	0.0000	OK
15 minute winter	147	10	120.821	0.046	4.7	0.0713	0.0000	OK
15 minute winter	148	10	120.759	0.059	9.4	0.0879	0.0000	OK
15 minute winter	149	10	120.336	0.061	17.9	0.1138	0.0000	OK
15 minute winter	150	10	119.818	0.068	28.9	0.1403	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	126	1.033	127	99.0	2.575	0.086	1.2356	
30 minute winter	127	1.034	146	101.6	2.345	0.075	1.9295	
15 minute winter	128	29.000	129	4.8	1.060	0.155	0.0187	
15 minute winter	129	29.001	130	4.8	1.772	0.206	0.0085	
15 minute winter	130	29.002	131	4.8	0.317	0.000	0.0597	
15 minute winter	131	29.003	132	4.8	0.300	0.000	0.1863	
15 minute winter	132	29.004	133	4.8	0.266	0.000	0.1315	
15 minute winter	133	29.005	134	9.4	0.454	0.000	0.1225	
15 minute winter	134	29.006	135	9.5	0.437	0.001	0.2756	
15 minute winter	135	29.007	138	9.4	0.357	0.001	0.2037	
15 minute winter	136	30.000	137	4.0	1.534	0.012	0.0194	
15 minute winter	137	30.001	138	3.9	1.360	0.014	0.0230	
15 minute winter	138	29.008	139	13.2	0.208	0.001	0.5035	
15 minute winter	139	29.009	146	12.9	1.003	0.274	0.2679	
15 minute winter	140	31.000	141	15.7	2.085	0.054	0.0438	
15 minute winter	141	31.001	142	15.6	1.762	0.054	0.0688	
15 minute winter	142	31.002	143	19.4	1.622	0.098	0.3892	
15 minute winter	143	31.003	146	25.4	1.963	0.123	0.3013	
15 minute winter	144	32.000	145	13.3	1.903	0.113	0.0721	
15 minute winter	145	32.001	146	14.8	1.829	0.061	0.0643	
30 minute winter	146	1.035	153	137.5	2.766	0.126	2.2469	
15 minute winter	147	33.000	148	4.7	0.661	0.081	0.0432	
15 minute winter	148	33.001	149	9.2	1.127	0.145	0.1927	
15 minute winter	149	33.002	150	17.8	1.596	0.089	0.1815	
15 minute winter	150	33.003	151	28.5	1.900	0.114	0.5334	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	151	10	118.067	0.092	38.0	0.1766	0.0000	OK
15 minute winter	152	11	117.375	0.075	37.5	0.0852	0.0000	OK
15 minute winter	153	11	116.460	0.135	177.5	0.2858	0.0000	OK
15 minute winter	154	10	139.366	0.041	7.1	0.0713	0.0000	OK
15 minute winter	155	10	139.212	0.062	7.0	0.0702	0.0000	OK
15 minute winter	156	11	139.119	0.044	15.6	0.0487	0.0000	OK
15 minute winter	157	12	138.603	0.028	15.5	0.0000	0.0000	OK
15 minute winter	158	10	137.877	0.052	12.7	0.1277	0.0000	OK
15 minute winter	159	10	137.685	0.060	15.8	0.1006	0.0000	OK
15 minute winter	160	11	137.276	0.051	38.0	0.0562	0.0000	OK
15 minute winter	161	12	136.721	0.046	37.6	0.0000	0.0000	OK
15 minute winter	162	12	135.321	0.046	37.2	0.0000	0.0000	OK
15 minute winter	163	12	134.802	0.052	46.7	0.0785	0.0000	OK
15 minute winter	164	12	133.812	0.062	47.0	0.0000	0.0000	OK
15 minute winter	165	14	133.279	0.154	46.4	0.0000	0.0000	OK
15 minute winter	166	14	133.275	0.175	40.4	0.0000	0.0000	OK
15 minute winter	167	10	136.037	0.087	55.6	0.4562	0.0000	OK
15 minute winter	168	11	132.631	0.106	54.8	0.1519	0.0000	OK
15 minute winter	169	14	132.477	0.177	83.0	0.0000	0.0000	OK
15 minute winter	170	14	132.455	0.205	79.2	0.0000	0.0000	OK
15 minute winter	171	14	132.447	0.222	79.5	0.2071	0.0000	OK
15 minute winter	172	14	132.348	0.148	78.9	0.0000	0.0000	OK
15 minute winter	173	14	132.335	0.160	79.0	0.0000	0.0000	OK
15 minute winter	174	10	132.572	0.072	15.8	0.1978	0.0000	OK
15 minute winter	175	10	132.542	0.142	31.4	0.3918	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	151	33.004	152	37.5	2.349	0.176	0.2963	
15 minute winter	152	33.005	153	37.6	2.922	0.114	0.0995	
15 minute winter	153	1.036	280	176.3	3.867	0.103	1.5879	
15 minute winter	154	34.000	155	7.0	0.874	0.041	0.0591	
15 minute winter	155	34.001	156	6.9	0.828	0.092	0.1362	
15 minute winter	156	34.002	157	15.5	0.389	0.002	1.3856	
15 minute winter	157	34.003	160	14.9	0.342	0.001	1.5422	
15 minute winter	158	35.000	159	12.6	1.230	0.038	0.0769	
15 minute winter	159	35.001	160	15.7	1.626	0.051	0.1695	
15 minute winter	160	34.004	161	37.6	0.681	0.003	0.9086	
15 minute winter	161	34.005	162	37.2	0.719	0.002	1.6033	
15 minute winter	162	34.006	163	37.3	0.662	0.002	0.6656	
15 minute winter	163	34.007	164	47.0	0.708	0.003	1.4772	
15 minute winter	164	34.008	165	46.4	0.409	0.004	3.6747	
15 minute winter	165	34.009	166	40.4	0.180	0.010	2.2049	
15 minute winter	166	Orifice	169	40.4				
15 minute winter	167	36.000	168	54.8	2.219	0.083	2.0486	
15 minute winter	168	36.001	169	54.0	1.548	0.111	0.4041	
15 minute winter	169	34.011	170	79.2	0.318	0.008	6.7654	
15 minute winter	170	34.012	171	74.5	0.237	0.008	4.2407	
15 minute winter	171	Head/Flow	172	78.9				
15 minute winter	172	34.014	173	79.0	0.370	0.006	1.1918	
15 minute winter	173	Head/Flow	176	79.0				
15 minute winter	174	37.000	175	15.6	0.698	0.122	0.1709	
15 minute winter	175	37.001	176	30.8	0.978	0.437	0.5847	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	176	13	132.238	0.088	98.2	0.0000	0.0000	OK
15 minute winter	177	10	131.093	0.092	15.8	0.2336	0.0000	OK
15 minute winter	178	13	130.857	0.156	21.9	0.2971	0.0000	OK
15 minute winter	179	13	130.857	0.207	118.5	0.1105	0.0000	OK
15 minute winter	180	10	137.691	0.091	31.6	0.3433	0.0000	OK
15 minute winter	181	10	136.504	0.104	46.4	0.2719	0.0000	OK
15 minute winter	182	10	136.314	0.089	46.1	0.1279	0.0000	OK
15 minute winter	183	10	135.466	0.091	15.8	0.2241	0.0000	OK
15 minute winter	184	10	135.358	0.108	24.3	0.1950	0.0000	OK
15 minute winter	185	11	135.126	0.101	69.6	0.1442	0.0000	OK
15 minute winter	186	10	133.865	0.065	15.8	0.1586	0.0000	OK
15 minute winter	187	10	133.492	0.092	21.1	0.1710	0.0000	OK
15 minute winter	188	10	134.026	0.076	31.6	0.2789	0.0000	OK
15 minute winter	189	10	133.611	0.086	43.3	0.2001	0.0000	OK
15 minute winter	190	11	133.185	0.160	135.5	0.3091	0.0000	OK
15 minute winter	191	11	132.342	0.142	143.7	0.3288	0.0000	OK
15 minute winter	192	11	130.644	0.143	153.2	0.3448	0.0000	OK
15 minute winter	193	12	130.281	0.331	260.7	0.9757	0.0000	OK
15 minute winter	194	13	129.638	0.238	261.9	0.0000	0.0000	OK
15 minute winter	195	10	130.173	0.072	15.8	0.1778	0.0000	OK
15 minute winter	196	10	129.650	0.075	21.5	0.1577	0.0000	OK
15 minute winter	197	13	129.586	0.336	275.1	0.0000	0.0000	OK
15 minute winter	198	10	129.502	0.077	28.5	0.2826	0.0000	OK
15 minute winter	199	10	128.832	0.107	40.0	0.3199	0.0000	OK
15 minute winter	200	13	128.738	0.213	299.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	176	34.016	179	98.3	0.462	0.003	10.2604	
15 minute winter	177	38.000	178	15.6	1.084	0.298	0.1064	
15 minute winter	178	38.001	179	20.4	0.953	0.072	0.3936	
15 minute winter	179	34.017	193	115.0	1.137	0.134	2.1333	
15 minute winter	180	39.000	181	30.6	1.723	0.195	0.9438	
15 minute winter	181	39.001	182	46.1	1.855	0.089	0.1705	
15 minute winter	182	39.002	185	46.1	1.894	0.088	1.1313	
15 minute winter	183	40.000	184	15.6	1.146	0.263	0.0525	
15 minute winter	184	40.001	185	24.1	1.132	0.232	0.1822	
15 minute winter	185	39.003	190	70.3	2.718	0.106	1.1507	
15 minute winter	186	41.000	187	15.6	1.448	0.094	0.1568	
15 minute winter	187	41.001	190	20.7	1.039	0.121	0.4083	
15 minute winter	188	42.000	189	31.4	2.567	0.095	0.0384	
15 minute winter	189	42.001	190	43.0	2.211	0.065	0.1648	
15 minute winter	190	39.004	191	136.3	2.457	0.144	2.4364	
15 minute winter	191	39.005	192	144.3	2.925	0.117	2.5264	
15 minute winter	192	39.006	193	153.3	2.652	0.078	0.6039	
15 minute winter	193	34.018	194	261.9	1.613	0.324	3.9181	
15 minute winter	194	34.019	197	256.9	0.562	0.017	13.9556	
15 minute winter	195	43.000	196	15.6	1.455	0.207	0.1934	
15 minute winter	196	43.001	197	21.4	1.304	0.088	0.5173	
15 minute winter	197	Head/Flow	200	268.8				
15 minute winter	198	44.000	199	28.1	1.803	0.085	0.3147	
15 minute winter	199	44.001	200	39.5	1.177	0.085	0.6691	
15 minute winter	200	34.021	201	297.2	0.784	0.014	18.0163	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	14	128.247	0.247	297.2	0.0000	0.0000	OK
15 minute winter	202	15	127.973	0.348	288.3	0.0000	0.0000	OK
15 minute winter	203	10	136.261	0.060	18.2	0.1611	0.0000	OK
15 minute winter	204	10	134.578	0.103	15.8	0.2608	0.0000	OK
15 minute winter	205	10	134.446	0.096	17.9	0.1277	0.0000	OK
15 minute winter	206	10	134.221	0.071	38.8	0.1178	0.0000	OK
15 minute winter	207	10	132.500	0.100	53.5	0.2568	0.0000	OK
15 minute winter	208	11	132.227	0.102	54.4	0.1586	0.0000	OK
15 minute winter	209	11	131.966	0.116	69.9	0.3022	0.0000	OK
15 minute winter	210	10	131.520	0.070	26.9	0.2313	0.0000	OK
15 minute winter	211	11	130.807	0.132	98.8	0.2613	0.0000	OK
15 minute winter	212	11	130.028	0.128	102.5	0.2534	0.0000	OK
15 minute winter	213	10	130.066	0.066	9.5	0.1295	0.0000	OK
15 minute winter	214	11	129.611	0.161	114.7	0.3164	0.0000	OK
15 minute winter	215	10	134.622	0.047	12.7	0.1053	0.0000	OK
15 minute winter	216	10	133.907	0.057	15.8	0.0801	0.0000	OK
15 minute winter	217	10	132.605	0.080	15.8	0.1952	0.0000	OK
15 minute winter	218	10	132.433	0.083	34.1	0.1396	0.0000	OK
15 minute winter	219	10	133.178	0.053	10.3	0.1084	0.0000	OK
15 minute winter	220	10	132.212	0.112	91.5	0.5611	0.0000	OK
15 minute winter	221	11	129.055	0.230	219.6	0.8179	0.0000	OK
15 minute winter	222	11	128.647	0.197	235.7	0.6803	0.0000	OK
15 minute winter	223	10	128.899	0.049	15.8	0.1160	0.0000	OK
15 minute winter	224	10	128.382	0.057	23.6	0.1178	0.0000	OK
15 minute winter	225	13	127.477	0.352	467.7	0.8743	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	34.022	202	288.3	0.622	0.019	35.4759	
15 minute winter	202	34.023	225	276.9	1.542	0.495	1.1183	
15 minute winter	203	45.000	206	17.9	2.116	0.153	0.3068	
15 minute winter	204	46.000	205	15.5	0.935	0.367	0.1248	
15 minute winter	205	46.001	206	17.8	0.977	0.187	0.1237	
15 minute winter	206	45.001	207	38.5	1.847	0.055	0.7919	
15 minute winter	207	45.002	208	52.9	1.998	0.088	0.2100	
15 minute winter	208	45.003	209	54.6	1.844	0.095	0.2591	
15 minute winter	209	45.004	211	70.3	2.227	0.140	1.3447	
15 minute winter	210	47.000	211	26.7	2.259	0.103	0.1034	
15 minute winter	211	45.005	212	99.5	2.253	0.099	1.4608	
15 minute winter	212	45.006	214	102.7	1.843	0.075	1.1763	
15 minute winter	213	48.000	214	9.4	1.018	0.164	0.0761	
15 minute winter	214	45.007	221	115.2	1.822	0.119	3.2673	
15 minute winter	215	49.000	216	12.6	1.830	0.094	0.0760	
15 minute winter	216	49.001	218	15.6	2.014	0.134	0.2114	
15 minute winter	217	50.000	218	15.6	1.106	0.132	0.1257	
15 minute winter	218	49.002	220	34.0	2.156	0.072	0.0502	
15 minute winter	219	51.000	220	10.1	1.426	0.119	0.2138	
15 minute winter	220	49.003	221	89.5	2.991	0.132	2.0302	
15 minute winter	221	45.008	222	220.8	2.141	0.183	4.0554	
15 minute winter	222	45.009	225	231.3	2.611	0.144	5.7986	
15 minute winter	223	52.000	224	15.7	2.269	0.048	0.0361	
15 minute winter	224	52.001	225	23.5	2.336	0.044	0.0863	
15 minute winter	225	34.024	226	468.3	1.937	0.266	6.2069	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	226	13	126.326	0.351	470.1	1.0342	0.0000	OK
15 minute winter	227	1	126.100	0.000	0.0	0.0000	0.0000	OK
15 minute winter	228	13	125.721	0.371	473.3	1.1343	0.0000	OK
15 minute winter	229	13	125.319	0.519	477.6	1.6741	0.0000	OK
15 minute winter	230	1	125.225	0.000	0.0	0.0000	0.0000	OK
15 minute winter	231	13	125.138	0.513	478.6	1.5658	0.0000	OK
15 minute winter	232	14	124.944	0.519	477.3	1.5266	0.0000	OK
15 minute winter	233	14	124.754	0.579	502.8	3.4353	0.0000	OK
15 minute winter	234	14	124.325	0.625	505.6	2.2989	0.0000	OK
1440 minute winter	235	1500	124.154	0.503	53.4	0.5593	0.0000	SURCHARGED
1440 minute winter	236	1500	124.154	0.603	52.9	1678.1520	0.0000	SURCHARGED
1440 minute winter	237	1500	124.153	0.678	5.4	1.4907	0.0000	SURCHARGED
15 minute winter	238	10	123.594	0.044	8.7	0.0839	0.0000	OK
15 minute winter	239	11	122.287	0.062	20.2	0.1360	0.0000	OK
15 minute winter	240	10	128.309	0.059	12.7	0.1311	0.0000	OK
15 minute winter	241	11	126.965	0.065	18.6	0.1258	0.0000	OK
15 minute winter	242	10	126.470	0.095	24.5	0.1797	0.0000	OK
15 minute winter	243	10	127.710	0.035	5.2	0.0557	0.0000	OK
15 minute winter	244	10	127.211	0.036	5.2	0.0408	0.0000	OK
15 minute winter	245	11	126.386	0.136	36.3	0.2549	0.0000	OK
15 minute winter	246	11	126.156	0.081	43.3	0.1518	0.0000	OK
15 minute winter	247	11	125.196	0.096	73.1	0.3686	0.0000	OK
15 minute winter	248	10	123.986	0.036	6.3	0.0618	0.0000	OK
15 minute winter	249	10	123.520	0.045	7.9	0.0570	0.0000	OK
15 minute winter	250	11	122.721	0.121	83.7	0.2026	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	226	34.025	228	470.3	1.970	0.252	2.8567	
15 minute winter	227	53.000	228	0.0	0.000	0.000	0.0000	
15 minute winter	228	34.026	229	473.0	1.430	0.305	5.2549	
15 minute winter	229	34.027	231	475.7	1.190	0.496	5.2635	
15 minute winter	230	54.000	231	0.0	0.000	0.000	0.0000	
15 minute winter	231	34.028	232	475.5	1.196	0.489	5.8623	
15 minute winter	232	34.029	233	477.4	1.109	0.504	8.3505	
15 minute winter	233	34.030	234	502.3	1.337	0.622	9.9773	
15 minute winter	234	34.031	235	504.9	1.093	0.784	11.7149	
1440 minute winter	235	34.032	236	52.3	0.076	0.205	94.3558	
1440 minute winter	236	34.033	237	5.4	0.195	0.046	0.4729	
1440 minute winter	237	Depth/Flow	239	5.4				
15 minute winter	238	55.000	239	8.5	1.567	0.082	0.1632	
15 minute winter	239	34.035	252	20.3	1.812	0.050	0.0689	
15 minute winter	240	56.000	241	12.3	1.520	0.144	0.3646	
15 minute winter	241	56.001	242	18.4	1.481	0.062	0.2574	
15 minute winter	242	56.002	245	24.5	0.767	0.097	0.6536	
15 minute winter	243	57.000	244	5.2	1.637	0.108	0.0223	
15 minute winter	244	57.001	245	5.1	1.610	0.118	0.0338	
15 minute winter	245	56.003	246	36.6	1.246	0.186	1.3997	
15 minute winter	246	56.004	247	43.2	1.968	0.072	0.6325	
15 minute winter	247	56.005	250	73.1	2.493	0.102	1.5030	
15 minute winter	248	58.000	249	6.3	1.649	0.122	0.0219	
15 minute winter	249	58.001	250	7.8	1.844	0.174	0.0388	
15 minute winter	250	56.006	251	83.8	2.170	0.139	0.5065	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	251	11	122.292	0.142	90.5	0.2805	0.0000	OK
15 minute winter	252	11	121.630	0.105	112.3	0.2785	0.0000	OK
15 minute winter	253	11	120.499	0.124	117.5	0.3561	0.0000	OK
15 minute winter	254	11	119.078	0.103	124.7	0.3136	0.0000	OK
15 minute winter	255	1	124.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	256	1	124.325	0.000	0.0	0.0000	0.0000	OK
15 minute winter	257	11	123.786	0.011	3.2	0.0043	0.0000	OK
15 minute winter	258	11	122.266	0.016	5.9	0.0063	0.0000	OK
15 minute winter	259	13	121.316	0.016	5.6	0.0000	0.0000	OK
15 minute winter	260	14	119.846	0.021	5.3	0.0000	0.0000	OK
120 minute winter	261	94	119.805	0.204	2.3	0.0000	0.0000	SURCHARGED
15 minute winter	262	10	119.201	0.101	15.8	0.2544	0.0000	OK
15 minute winter	263	10	119.151	0.100	15.6	0.1136	0.0000	OK
15 minute winter	264	11	118.577	0.202	142.5	0.5471	0.0000	OK
15 minute winter	265	11	118.457	0.182	146.4	0.5108	0.0000	OK
15 minute winter	266	10	119.619	0.069	15.8	0.1694	0.0000	OK
15 minute winter	267	10	118.719	0.119	29.6	0.2990	0.0000	OK
15 minute winter	268	11	118.290	0.140	183.7	0.4273	0.0000	OK
15 minute winter	269	11	117.470	0.170	187.7	0.4831	0.0000	OK
15 minute winter	270	11	117.095	0.145	190.5	0.4039	0.0000	OK
15 minute winter	271	12	116.002	0.152	197.0	0.4610	0.0000	OK
15 minute winter	272	11	114.483	0.208	216.3	1.0213	0.0000	OK
15 minute winter	273	10	115.535	0.060	12.7	0.1232	0.0000	OK
15 minute winter	274	10	115.104	0.079	17.7	0.1380	0.0000	OK
15 minute winter	275	12	114.348	0.223	234.9	0.8618	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	251	56.007	252	90.5	2.358	0.160	0.3167	
15 minute winter	252	34.036	253	112.4	2.520	0.035	1.2814	
15 minute winter	253	34.037	254	117.3	2.667	0.045	2.3404	
15 minute winter	254	34.038	264	124.1	1.837	0.034	0.7787	
15 minute winter	255	59.000	256	0.0	0.000	0.000	0.0005	
15 minute winter	256	59.001	257	0.0	0.000	0.000	0.1295	
15 minute winter	257	59.002	258	2.9	0.208	0.000	0.5835	
15 minute winter	258	59.003	259	5.6	0.351	0.000	0.3920	
15 minute winter	259	59.004	260	5.3	0.312	0.000	0.8429	
15 minute winter	260	59.005	261	4.7	0.166	0.001	2.2748	
120 minute winter	261	Depth/Flow	264	1.0				
15 minute winter	262	60.000	263	15.6	0.908	0.318	0.0960	
15 minute winter	263	60.001	264	15.3	0.944	0.364	0.1853	
15 minute winter	264	34.039	265	141.9	1.511	0.107	1.3561	
15 minute winter	265	34.040	268	145.6	2.015	0.082	0.7372	
15 minute winter	266	61.000	267	15.5	1.537	0.194	0.3121	
15 minute winter	267	61.001	268	29.2	0.920	0.139	0.5591	
15 minute winter	268	34.041	269	183.2	2.653	0.059	1.5699	
15 minute winter	269	34.042	270	186.8	2.646	0.072	0.9395	
15 minute winter	270	34.043	271	189.6	2.934	0.063	2.0097	
15 minute winter	271	34.044	272	197.7	3.083	0.068	2.1863	
15 minute winter	272	34.045	275	217.6	1.537	0.044	2.1353	
15 minute winter	273	62.000	274	12.6	1.583	0.131	0.0528	
15 minute winter	274	62.001	275	17.5	1.000	0.058	0.1488	
15 minute winter	275	34.046	276	237.8	1.529	0.061	5.6007	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	276	12	114.136	0.236	248.9	1.0237	0.0000	OK
15 minute winter	277	10	116.287	0.037	7.9	0.0658	0.0000	OK
15 minute winter	278	10	115.862	0.037	9.4	0.0456	0.0000	OK
15 minute winter	279	12	113.985	0.210	261.1	0.8073	0.0000	OK
15 minute winter	280	12	113.785	0.260	443.2	1.0488	0.0000	OK
15 minute winter	281	12	113.260	0.185	449.2	0.7306	0.0000	OK
15 minute winter	282	10	115.220	0.045	7.9	0.0830	0.0000	OK
15 minute winter	283	10	114.867	0.041	9.4	0.0527	0.0000	OK
15 minute winter	284	10	113.959	0.059	12.5	0.0812	0.0000	OK
15 minute winter	285	10	113.794	0.094	18.3	0.1475	0.0000	OK
15 minute winter	286	11	113.602	0.077	21.2	0.1061	0.0000	OK
15 minute winter	287	12	112.152	0.302	475.8	1.2292	0.0000	OK
15 minute winter	288	12	111.929	0.329	486.1	1.4214	0.0000	OK
15 minute winter	289	12	111.781	0.305	484.6	1.0581	0.0000	OK
15 minute winter	290	10	114.017	0.067	20.1	0.1817	0.0000	OK
15 minute winter	291	10	113.024	0.074	31.6	0.1726	0.0000	OK
15 minute winter	292	12	111.309	0.259	514.8	1.2406	0.0000	OK
15 minute winter	293	10	112.157	0.057	11.1	0.1204	0.0000	OK
15 minute winter	294	10	112.046	0.070	12.6	0.0893	0.0000	OK
15 minute winter	295	13	111.048	0.448	526.2	2.0796	0.0000	OK
15 minute winter	296	13	111.016	0.441	518.1	0.0000	0.0000	OK
15 minute winter	297	10	111.641	0.041	7.1	0.0680	0.0000	OK
15 minute winter	298	10	111.352	0.027	7.0	0.0303	0.0000	OK
15 minute winter	299	14	110.750	0.300	525.5	0.0000	0.0000	OK
15 minute winter	300	10	125.004	0.029	4.0	0.0428	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	276	34.047	279	250.8	1.682	0.064	2.9816	
15 minute winter	277	63.000	278	7.8	1.592	0.030	0.0370	
15 minute winter	278	63.001	279	9.4	1.927	0.031	0.0702	
15 minute winter	279	34.048	280	261.8	1.638	0.048	3.2750	
15 minute winter	280	1.037	281	444.9	3.002	0.076	4.7807	
15 minute winter	281	1.038	287	449.8	2.662	0.048	5.9722	
15 minute winter	282	64.000	283	7.8	1.465	0.080	0.0536	
15 minute winter	283	64.001	284	9.3	1.908	0.069	0.0630	
15 minute winter	284	64.002	285	12.4	0.876	0.084	0.1634	
15 minute winter	285	64.003	286	18.1	1.103	0.197	0.4227	
15 minute winter	286	64.004	287	21.3	1.525	0.138	0.5126	
15 minute winter	287	1.039	288	475.7	1.945	0.094	5.9329	
15 minute winter	288	1.040	289	484.6	2.038	0.105	2.5196	
15 minute winter	289	1.041	292	483.0	2.553	0.090	1.4707	
15 minute winter	290	65.000	291	19.7	1.728	0.104	0.3652	
15 minute winter	291	65.001	292	31.3	2.104	0.079	0.2991	
15 minute winter	292	1.042	295	513.3	1.641	0.050	7.6969	
15 minute winter	293	66.000	294	11.0	1.190	0.114	0.0339	
15 minute winter	294	66.001	295	12.5	1.273	0.171	0.0501	
15 minute winter	295	1.043	296	518.1	1.216	0.152	5.3586	
15 minute winter	296	1.044	299	521.0	0.675	0.058	49.2460	
15 minute winter	297	67.000	298	7.0	1.607	0.033	0.0334	
15 minute winter	298	67.001	299	7.0	2.447	0.016	0.2179	
15 minute winter	299	1.045	325	511.7	0.712	0.027	21.1428	
15 minute winter	300	68.000	301	3.9	0.906	0.035	0.0826	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	124.171	0.046	10.2	0.0782	0.0000	OK
15 minute winter	302	10	123.546	0.046	10.1	0.0517	0.0000	OK
15 minute winter	303	10	122.671	0.071	21.9	0.1672	0.0000	OK
15 minute winter	304	10	122.324	0.124	34.4	0.2960	0.0000	OK
15 minute winter	305	11	122.153	0.152	47.7	0.3574	0.0000	OK
15 minute winter	306	10	128.509	0.059	9.5	0.1160	0.0000	OK
15 minute winter	307	10	128.153	0.053	11.3	0.0693	0.0000	OK
15 minute winter	308	10	127.556	0.055	13.5	0.0743	0.0000	OK
15 minute winter	309	10	127.000	0.050	4.7	0.0776	0.0000	OK
15 minute winter	310	11	126.909	0.084	20.4	0.1109	0.0000	OK
15 minute winter	311	10	126.910	0.035	6.3	0.0585	0.0000	OK
15 minute winter	312	10	126.647	0.047	10.4	0.0696	0.0000	OK
15 minute winter	313	11	126.244	0.069	34.9	0.1048	0.0000	OK
15 minute winter	314	10	124.171	0.046	7.9	0.0859	0.0000	OK
15 minute winter	315	10	123.517	0.042	12.5	0.0655	0.0000	OK
15 minute winter	316	11	121.911	0.111	103.5	0.2073	0.0000	OK
15 minute winter	317	11	120.093	0.143	103.4	0.2046	0.0000	OK
15 minute winter	318	11	119.739	0.089	103.2	0.0000	0.0000	OK
15 minute winter	319	11	119.564	0.089	103.1	0.0000	0.0000	OK
15 minute winter	320	12	119.120	0.170	102.6	0.0000	0.0000	OK
15 minute winter	321	12	117.977	0.077	101.9	0.0000	0.0000	OK
15 minute winter	322	12	116.722	0.172	102.2	0.0000	0.0000	OK
15 minute winter	323	13	114.940	0.165	98.7	0.0000	0.0000	OK
15 minute winter	324	13	112.945	0.170	98.7	0.0000	0.0000	OK
15 minute winter	325	14	110.600	0.400	600.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	68.001	302	10.1	1.744	0.087	0.0729	
15 minute winter	302	68.002	303	10.0	1.785	0.085	0.0822	
15 minute winter	303	68.003	304	21.7	1.578	0.070	0.1869	
15 minute winter	304	68.004	305	33.9	0.833	0.169	2.1269	
15 minute winter	305	68.005	316	47.6	1.233	0.236	1.9731	
15 minute winter	306	69.000	307	9.4	1.212	0.140	0.1635	
15 minute winter	307	69.001	308	11.1	1.505	0.119	0.1385	
15 minute winter	308	69.002	310	13.3	1.302	0.134	0.1948	
15 minute winter	309	70.000	310	4.6	0.482	0.110	0.1903	
15 minute winter	310	69.003	313	20.3	1.553	0.279	0.3844	
15 minute winter	311	71.000	312	6.3	1.082	0.029	0.0437	
15 minute winter	312	71.001	313	10.3	1.117	0.054	0.1377	
15 minute winter	313	69.004	316	35.0	2.928	0.112	0.6480	
15 minute winter	314	72.000	315	7.8	1.830	0.184	0.0492	
15 minute winter	315	72.001	316	12.5	3.276	0.148	0.0237	
15 minute winter	316	68.006	317	103.4	2.821	0.137	1.2587	
15 minute winter	317	68.007	318	103.2	3.193	0.188	0.3427	
15 minute winter	318	68.008	319	103.1	0.913	0.007	0.5838	
15 minute winter	319	68.009	320	102.6	0.628	0.007	2.8669	
15 minute winter	320	Head/Flow	321	101.9				
15 minute winter	321	68.011	322	102.2	0.687	0.006	4.2994	
15 minute winter	322	Head/Flow	323	98.7				
15 minute winter	323	Head/Flow	324	98.7				
15 minute winter	324	Head/Flow	325	98.9				
15 minute winter	325	1.046	326	594.9	0.868	0.208	20.1618	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	14	110.422	0.422	594.9	3.9480	0.0000	OK
15 minute winter	327	16	110.123	0.548	604.6	5.1251	0.0000	OK
15 minute winter	328	16	109.836	0.435	570.8	0.0000	0.0000	SURCHARGED
15 minute winter	329	18	109.621	0.396	605.5	0.0000	0.0000	SURCHARGED
15 minute winter	330	20	109.489	0.389	552.0	0.0000	0.0000	SURCHARGED
1440 minute winter	331	1680	109.389	0.439	53.8	0.0000	0.0000	SURCHARGED
1440 minute winter	332	1680	109.389	0.539	52.5	1579.4650	0.0000	SURCHARGED
1440 minute winter	333	1680	109.388	0.588	5.6	0.6652	0.0000	SURCHARGED
15 minute winter	334	1	107.370	0.000	3.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	1.047	327	604.6	0.813	0.232	46.9536	
15 minute winter	327	1.048	328	570.8	1.444	0.343	11.7133	
15 minute winter	328	1.049	329	605.5	0.665	1.953	84.0642	
15 minute winter	329	1.050	330	552.0	0.659	1.751	55.1353	
15 minute winter	330	1.051	331	506.4	0.629	1.631	62.3851	
1440 minute winter	331	1.052	332	52.5	0.061	0.164	61.7557	
1440 minute winter	332	1.053	333	5.6	0.080	0.100	1.3715	
1440 minute winter	333	Depth/Flow	334	5.6				429.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	141.746	0.071	12.8	0.1082	0.0000	OK
15 minute winter	2	10	141.672	0.247	111.7	0.9902	0.0000	OK
15 minute winter	3	10	142.238	0.113	51.5	0.3006	0.0000	OK
15 minute winter	4	11	141.505	0.255	171.9	0.4271	0.0000	OK
15 minute winter	5	10	141.399	0.199	55.3	0.5842	0.0000	OK
15 minute winter	6	11	141.047	0.222	54.5	0.3929	0.0000	OK
15 minute winter	7	11	141.042	0.342	252.4	0.8399	0.0000	OK
15 minute winter	8	11	140.954	0.279	267.5	0.5913	0.0000	OK
15 minute winter	9	10	140.863	0.113	43.4	0.2751	0.0000	OK
15 minute winter	10	11	140.283	0.183	320.3	0.3725	0.0000	OK
15 minute winter	11	13	139.059	0.083	17.0	3.4794	0.0000	OK
15 minute winter	12	10	140.089	0.089	42.5	0.2307	0.0000	OK
15 minute winter	13	10	139.605	0.080	55.8	0.1434	0.0000	OK
15 minute winter	14	11	138.420	0.145	73.1	0.3941	0.0000	OK
15 minute winter	15	10	139.317	0.092	57.8	0.2752	0.0000	OK
15 minute winter	16	11	138.319	0.243	169.0	0.7615	0.0000	OK
15 minute winter	17	11	138.301	0.451	222.5	1.5009	0.0000	OK
15 minute winter	18	11	138.285	0.460	213.2	1.1849	0.0000	OK
15 minute winter	19	11	138.267	0.492	543.7	1.3469	0.0000	OK
15 minute winter	20	10	140.182	0.107	17.0	0.1835	0.0000	OK
15 minute winter	21	10	139.977	0.052	16.8	0.0585	0.0000	OK
15 minute winter	22	11	139.039	0.064	16.8	0.0000	0.0000	OK
15 minute winter	23	11	138.957	0.082	41.6	0.1061	0.0000	OK
15 minute winter	24	11	138.191	0.591	582.4	1.5311	0.0000	OK
15 minute winter	25	12	138.031	0.506	599.3	1.4257	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	12.7	0.987	0.101	0.1283	
15 minute winter	2	1.001	4	109.6	1.215	0.525	3.7661	
15 minute winter	3	2.000	4	50.8	2.183	0.274	0.6119	
15 minute winter	4	1.002	7	171.7	1.940	0.563	3.9753	
15 minute winter	5	3.000	6	54.5	1.606	0.863	0.1714	
15 minute winter	6	3.001	7	53.4	0.778	0.140	0.7995	
15 minute winter	7	1.003	8	253.1	1.720	0.564	0.8608	
15 minute winter	8	1.004	10	269.0	2.691	0.386	5.6425	
15 minute winter	9	4.000	10	42.9	1.857	0.265	0.3841	
15 minute winter	10	1.005	19	320.7	3.454	0.211	5.3820	
15 minute winter	11	5.000	14	11.3	0.864	0.282	0.3823	
15 minute winter	12	6.000	13	42.2	2.058	0.076	0.3312	
15 minute winter	13	6.001	14	55.5	3.118	0.059	0.2018	
15 minute winter	14	5.001	16	73.1	0.816	0.086	3.8180	
15 minute winter	15	7.000	16	57.3	2.577	0.083	0.4169	
15 minute winter	16	5.002	17	164.3	0.905	0.236	14.0993	
15 minute winter	17	5.003	18	210.7	0.806	0.270	1.7508	
15 minute winter	18	5.004	19	216.4	0.831	0.321	4.9160	
15 minute winter	19	1.006	24	538.1	1.580	0.414	5.3860	
15 minute winter	20	8.000	21	16.8	1.777	0.684	0.0741	
15 minute winter	21	8.001	22	16.8	2.881	0.249	0.0414	
15 minute winter	22	8.002	23	15.5	0.176	0.004	3.6377	
15 minute winter	23	8.003	24	41.1	3.310	0.251	0.0947	
15 minute winter	24	1.007	25	584.0	1.694	0.907	9.4266	
15 minute winter	25	1.008	26	606.1	2.574	0.982	9.4126	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	11	137.717	0.292	620.5	0.8265	0.0000	OK
15 minute winter	27	10	138.518	0.043	12.8	0.0668	0.0000	OK
15 minute winter	28	12	137.492	0.742	652.7	2.1203	0.0000	OK
15 minute winter	29	12	137.330	0.680	683.8	2.1216	0.0000	OK
15 minute winter	30	12	137.095	0.545	694.7	1.5662	0.0000	OK
15 minute winter	31	10	137.365	0.115	27.6	0.2165	0.0000	OK
15 minute winter	32	10	137.201	0.126	38.0	0.1769	0.0000	OK
15 minute winter	33	12	136.892	0.442	729.8	1.2125	0.0000	OK
15 minute winter	34	13	136.225	0.325	739.4	0.9472	0.0000	OK
15 minute winter	35	10	138.393	0.093	20.0	0.1622	0.0000	OK
15 minute winter	36	10	138.498	0.073	17.0	0.1212	0.0000	OK
15 minute winter	37	11	138.049	0.149	74.4	0.3460	0.0000	OK
15 minute winter	38	11	137.587	0.112	74.5	0.1653	0.0000	OK
15 minute winter	39	11	136.505	0.155	94.8	0.3020	0.0000	OK
15 minute winter	40	10	136.694	0.094	26.8	0.1766	0.0000	OK
15 minute winter	41	10	136.473	0.123	53.4	0.2585	0.0000	OK
15 minute winter	42	10	136.323	0.148	53.1	0.2613	0.0000	OK
15 minute winter	43	11	135.987	0.212	147.7	0.5386	0.0000	OK
15 minute winter	44	10	137.057	0.082	12.8	0.1282	0.0000	OK
15 minute winter	45	10	136.868	0.043	12.7	0.0487	0.0000	OK
15 minute winter	46	13	135.772	0.422	162.3	1.0749	0.0000	OK
15 minute winter	47	10	136.687	0.087	31.9	0.1734	0.0000	OK
15 minute winter	48	10	136.289	0.089	46.2	0.1309	0.0000	OK
15 minute winter	49	13	135.769	0.494	180.3	1.2564	0.0000	OK
15 minute winter	50	13	135.762	0.587	167.8	1.7972	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	26	1.009	28	624.2	1.961	0.192	2.9043	
15 minute winter	27	9.000	28	12.8	2.301	0.081	0.2831	
15 minute winter	28	1.010	29	653.8	1.515	1.105	18.5665	
15 minute winter	29	1.011	30	680.1	1.766	1.149	16.4811	
15 minute winter	30	1.012	33	689.7	2.269	0.799	6.2549	
15 minute winter	31	10.000	32	27.4	1.476	0.402	0.1085	
15 minute winter	32	10.001	33	37.5	1.423	0.318	0.4089	
15 minute winter	33	1.013	34	724.5	3.235	0.554	11.0637	
15 minute winter	34	1.014	54	739.8	2.650	0.243	3.4925	
15 minute winter	35	11.000	37	19.4	0.733	0.211	1.5466	
15 minute winter	36	12.000	37	16.7	0.708	0.132	0.9714	
15 minute winter	37	11.001	38	72.9	2.244	0.409	0.4460	
15 minute winter	38	11.002	39	74.8	2.844	0.175	0.6087	
15 minute winter	39	11.003	43	95.2	2.131	0.209	0.6221	
15 minute winter	40	13.000	41	26.6	1.576	0.156	0.0718	
15 minute winter	41	13.001	42	53.1	1.712	0.116	0.1565	
15 minute winter	42	13.002	43	52.5	1.083	0.167	2.0114	
15 minute winter	43	11.004	46	150.2	1.443	0.169	9.4049	
15 minute winter	44	14.000	45	12.7	1.834	0.426	0.0377	
15 minute winter	45	14.001	46	12.6	3.304	0.141	0.0123	
15 minute winter	46	11.005	49	134.2	0.860	0.157	7.8174	
15 minute winter	47	15.000	48	31.7	2.515	0.230	0.0591	
15 minute winter	48	15.001	49	46.1	2.995	0.133	0.0638	
15 minute winter	49	11.006	50	154.8	0.832	0.196	14.8371	
15 minute winter	50	11.007	53	181.2	0.718	0.223	7.9452	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	51	10	136.981	0.081	10.6	0.1215	0.0000	OK
15 minute winter	52	10	136.842	0.042	10.5	0.0470	0.0000	OK
15 minute winter	53	13	135.756	0.631	185.9	1.6057	0.0000	OK
15 minute winter	54	13	135.751	0.676	910.3	1.8548	0.0000	OK
15 minute winter	55	13	135.485	0.485	923.2	1.4382	0.0000	OK
15 minute winter	56	13	135.278	0.753	926.5	2.1088	0.0000	OK
15 minute winter	57	13	135.129	0.629	927.1	1.6539	0.0000	OK
15 minute winter	58	14	134.871	0.396	950.3	1.1226	0.0000	OK
15 minute winter	59	14	133.466	0.490	973.1	1.5170	0.0000	OK
15 minute winter	60	10	134.090	0.140	40.4	0.3429	0.0000	OK
15 minute winter	61	10	133.832	0.082	40.0	0.0927	0.0000	OK
15 minute winter	62	14	133.167	0.367	982.1	0.0000	0.0000	OK
15 minute winter	63	10	133.540	0.090	17.4	0.1529	0.0000	OK
15 minute winter	64	10	133.446	0.096	25.8	0.1351	0.0000	OK
15 minute winter	65	15	132.843	0.743	985.3	0.0000	0.0000	OK
15 minute winter	66	10	133.018	0.143	34.0	0.2916	0.0000	OK
15 minute winter	67	10	132.830	0.155	46.3	0.2199	0.0000	OK
15 minute winter	68	10	132.724	0.149	56.6	0.2072	0.0000	OK
15 minute winter	69	10	132.489	0.088	56.2	0.1001	0.0000	OK
15 minute winter	70	15	131.809	0.584	935.5	0.0000	0.0000	OK
1440 minute winter	71	1500	131.785	0.635	57.3	0.0000	0.0000	SURCHARGED
1440 minute winter	72	1500	131.785	0.760	55.6	1749.8660	0.0000	SURCHARGED
1440 minute winter	73	1500	131.785	0.810	1.4	0.9156	0.0000	SURCHARGED
15 minute winter	74	10	130.877	0.052	18.2	0.1024	0.0000	OK
15 minute winter	75	10	130.003	0.078	21.3	0.1406	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	51	16.000	52	10.5	1.554	0.445	0.0389	
15 minute winter	52	16.001	53	10.5	2.757	0.147	0.0241	
15 minute winter	53	11.008	54	198.8	0.539	0.212	6.4163	
15 minute winter	54	1.015	55	911.0	2.273	1.355	16.3974	
15 minute winter	55	1.016	56	919.2	2.182	0.400	9.4845	
15 minute winter	56	1.017	57	924.7	2.034	1.057	3.8692	
15 minute winter	57	1.018	58	941.8	2.848	1.143	3.1304	
15 minute winter	58	1.019	59	962.0	3.297	0.450	24.1536	
15 minute winter	59	1.020	62	964.2	3.445	0.668	5.9039	
15 minute winter	60	17.000	61	40.0	1.699	0.546	0.1489	
15 minute winter	61	17.001	62	39.9	2.678	0.146	0.1052	
15 minute winter	62	1.021	65	973.6	1.000	0.041	80.5891	
15 minute winter	63	18.000	64	17.3	1.118	0.268	0.1012	
15 minute winter	64	18.001	65	25.5	1.645	0.344	0.1343	
15 minute winter	65	Head/Flow	70	916.3				
15 minute winter	66	19.000	67	33.5	1.346	0.626	0.2931	
15 minute winter	67	19.001	68	46.0	1.287	0.424	0.3740	
15 minute winter	68	19.002	69	56.2	2.172	0.378	0.2562	
15 minute winter	69	19.003	70	56.0	3.391	0.168	0.1202	
15 minute winter	70	1.023	71	934.9	2.267	0.764	5.1850	
1440 minute winter	71	1.024	72	55.6	0.063	0.266	139.8391	
1440 minute winter	72	1.025	73	1.4	0.020	0.028	1.7184	
1440 minute winter	73	Depth/Flow	74	0.9				
15 minute winter	74	1.027	78	18.0	1.505	0.042	0.5221	
15 minute winter	75	20.000	76	21.2	1.513	0.124	0.1049	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	76	10	129.824	0.073	21.2	0.0831	0.0000	OK
15 minute winter	77	10	129.591	0.065	21.0	0.0740	0.0000	OK
15 minute winter	78	10	128.923	0.072	49.4	0.1240	0.0000	OK
15 minute winter	79	10	135.708	0.083	20.4	0.1497	0.0000	OK
15 minute winter	80	10	134.737	0.137	44.3	0.2612	0.0000	OK
15 minute winter	81	11	134.361	0.136	70.0	0.3034	0.0000	OK
15 minute winter	82	11	133.600	0.225	103.6	0.5559	0.0000	OK
15 minute winter	83	11	133.312	0.212	146.1	0.5791	0.0000	OK
15 minute winter	84	11	132.769	0.169	174.5	0.3856	0.0000	OK
15 minute winter	85	11	131.372	0.297	175.3	0.5246	0.0000	OK
15 minute winter	86	12	131.143	0.293	174.7	0.5173	0.0000	OK
15 minute winter	87	12	131.008	0.258	173.9	0.4553	0.0000	OK
15 minute winter	88	10	134.398	0.123	34.5	0.2788	0.0000	OK
15 minute winter	89	10	134.294	0.168	44.8	0.2488	0.0000	OK
15 minute winter	90	11	134.116	0.066	44.4	0.0000	0.0000	OK
15 minute winter	91	12	133.293	0.093	43.7	0.0000	0.0000	OK
15 minute winter	92	12	132.417	0.117	41.9	0.1325	0.0000	OK
15 minute winter	93	10	132.810	0.060	17.0	0.1012	0.0000	OK
15 minute winter	94	10	132.310	0.060	16.9	0.0674	0.0000	OK
15 minute winter	95	11	131.881	0.206	57.3	0.2331	0.0000	OK
15 minute winter	96	1	133.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	97	1	132.575	0.000	0.0	0.0000	0.0000	OK
15 minute winter	98	12	131.679	0.054	55.8	0.0000	0.0000	OK
15 minute winter	99	13	130.786	0.361	251.0	0.4117	0.0000	OK
15 minute winter	100	13	130.756	0.381	239.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	76	20.001	77	21.0	1.706	0.109	0.0925	
15 minute winter	77	20.002	78	20.8	1.902	0.096	0.1737	
15 minute winter	78	1.028	119	48.9	3.411	0.075	0.2406	
15 minute winter	79	21.000	80	19.7	1.506	0.283	0.6961	
15 minute winter	80	21.001	81	43.7	1.445	0.397	0.9242	
15 minute winter	81	21.002	82	69.5	1.342	0.289	3.0885	
15 minute winter	82	21.003	83	103.2	1.579	0.600	1.7640	
15 minute winter	83	21.004	84	146.5	2.292	0.402	2.5218	
15 minute winter	84	21.005	85	175.3	2.696	0.307	3.0989	
15 minute winter	85	21.006	86	174.7	1.403	0.562	6.7652	
15 minute winter	86	21.007	87	173.9	1.518	0.547	2.6455	
15 minute winter	87	21.008	99	174.8	1.759	0.429	0.7024	
15 minute winter	88	22.000	89	34.2	1.258	0.383	0.1386	
15 minute winter	89	22.001	90	44.4	2.152	0.926	0.1819	
15 minute winter	90	22.002	91	43.7	0.454	0.004	4.7753	
15 minute winter	91	22.003	92	41.9	2.318	0.363	0.3364	
15 minute winter	92	22.004	95	42.1	1.399	0.541	0.8218	
15 minute winter	93	23.000	94	16.9	2.002	0.140	0.0786	
15 minute winter	94	23.001	95	16.8	1.070	0.155	0.3082	
15 minute winter	95	22.005	98	55.8	2.364	1.325	0.1713	
15 minute winter	96	24.000	97	0.0	0.000	0.000	0.0022	
15 minute winter	97	24.001	98	0.0	0.000	0.000	0.6102	
15 minute winter	98	22.006	99	57.3	0.188	0.003	7.8875	
15 minute winter	99	21.009	100	239.7	1.578	0.686	3.5113	
15 minute winter	100	21.010	101	224.8	0.448	0.072	12.5794	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	13	130.748	0.398	224.8	0.0000	0.0000	OK
15 minute winter	102	13	130.639	0.314	219.6	0.0000	0.0000	OK
15 minute winter	103	14	130.619	0.319	219.5	0.0000	0.0000	OK
15 minute winter	104	14	130.609	0.334	217.7	0.0000	0.0000	OK
15 minute winter	105	14	130.401	0.151	217.2	0.0000	0.0000	OK
15 minute winter	106	14	130.327	0.127	28.9	0.2647	0.0000	OK
15 minute winter	107	14	130.328	0.253	28.5	0.2856	0.0000	SURCHARGED
15 minute winter	108	14	130.325	0.375	227.6	0.0000	0.0000	OK
15 minute winter	109	15	129.726	0.126	225.0	0.0000	0.0000	OK
15 minute winter	110	16	128.515	0.365	225.6	0.0000	0.0000	OK
15 minute winter	111	16	127.782	0.132	219.1	0.0000	0.0000	OK
15 minute winter	112	10	127.644	0.069	25.5	0.1357	0.0000	OK
15 minute winter	113	16	127.523	0.248	33.9	0.3497	0.0000	SURCHARGED
15 minute winter	114	16	127.522	0.447	225.4	0.0000	0.0000	OK
15 minute winter	115	17	127.387	0.337	223.6	0.0000	0.0000	OK
15 minute winter	116	17	127.381	0.356	222.2	0.0000	0.0000	OK
15 minute winter	117	17	127.374	0.374	220.4	0.0000	0.0000	OK
15 minute winter	118	17	127.371	0.396	219.3	0.0000	0.0000	OK
15 minute winter	119	17	127.056	0.206	228.2	0.3989	0.0000	OK
15 minute winter	120	17	125.852	0.152	229.6	0.3051	0.0000	OK
30 minute winter	121	24	123.122	0.147	232.4	0.2791	0.0000	OK
15 minute winter	122	10	121.453	0.102	12.8	0.1608	0.0000	OK
15 minute winter	123	10	121.373	0.098	12.6	0.1109	0.0000	OK
30 minute winter	124	24	120.910	0.210	240.0	0.3956	0.0000	OK
15 minute winter	125	10	120.674	0.124	17.9	0.2164	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	Head/Flow	102	219.6				
15 minute winter	102	Depth/Flow	103	219.5				
15 minute winter	103	21.013	104	217.7	0.454	0.057	6.4807	
15 minute winter	104	Depth/Flow	105	217.2				
15 minute winter	105	21.015	108	216.9	0.498	0.019	6.8824	
15 minute winter	106	25.000	107	28.5	1.305	0.400	0.2109	
15 minute winter	107	25.001	108	27.2	1.288	0.503	0.1835	
15 minute winter	108	Depth/Flow	109	225.0				
15 minute winter	109	21.017	110	225.6	0.792	0.014	14.6574	
15 minute winter	110	Depth/Flow	111	219.1				
15 minute winter	111	21.019	114	219.3	0.451	0.015	9.5279	
15 minute winter	112	26.000	113	25.4	1.245	0.170	0.0815	
15 minute winter	113	26.001	114	33.4	1.137	0.805	0.3099	
15 minute winter	114	Depth/Flow	115	223.6				
15 minute winter	115	21.021	116	222.2	0.359	0.052	5.5758	
15 minute winter	116	21.022	117	220.4	0.293	0.059	8.0202	
15 minute winter	117	21.023	118	219.3	0.265	0.046	5.2711	
15 minute winter	118	21.024	119	218.7	1.549	0.972	1.8186	
15 minute winter	119	1.029	120	228.3	3.242	0.221	3.6345	
15 minute winter	120	1.030	121	229.6	4.222	0.132	2.3208	
30 minute winter	121	1.031	124	232.4	3.313	0.136	2.6304	
15 minute winter	122	27.000	123	12.6	1.009	0.679	0.0856	
15 minute winter	123	27.001	124	12.4	1.065	0.684	0.1401	
30 minute winter	124	1.032	126	239.8	2.766	0.234	2.7569	
15 minute winter	125	28.000	126	17.6	1.202	0.874	0.1142	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	126	22	120.207	0.207	255.1	0.4260	0.0000	OK
30 minute winter	127	22	119.276	0.176	263.8	0.3631	0.0000	OK
15 minute winter	128	10	121.979	0.079	13.2	0.1247	0.0000	OK
15 minute winter	129	10	121.856	0.081	13.1	0.0918	0.0000	OK
15 minute winter	130	10	121.751	0.026	13.0	0.0000	0.0000	OK
15 minute winter	131	10	121.602	0.027	13.0	0.0000	0.0000	OK
15 minute winter	132	11	121.204	0.028	12.8	0.0000	0.0000	OK
15 minute winter	133	10	121.008	0.033	25.8	0.0206	0.0000	OK
15 minute winter	134	11	120.638	0.037	25.6	0.0000	0.0000	OK
15 minute winter	135	11	120.086	0.036	25.6	0.0000	0.0000	OK
15 minute winter	136	10	120.912	0.037	10.6	0.0546	0.0000	OK
15 minute winter	137	10	120.214	0.039	10.6	0.0441	0.0000	OK
15 minute winter	138	11	119.728	0.053	35.8	0.0000	0.0000	OK
15 minute winter	139	11	119.622	0.147	35.9	0.0000	0.0000	OK
15 minute winter	140	10	120.588	0.088	42.5	0.2170	0.0000	OK
15 minute winter	141	10	120.182	0.082	42.3	0.0923	0.0000	OK
15 minute winter	142	10	119.680	0.105	52.8	0.1545	0.0000	OK
15 minute winter	143	10	118.677	0.127	69.3	0.1927	0.0000	OK
15 minute winter	144	10	118.819	0.094	36.2	0.1811	0.0000	OK
15 minute winter	145	10	118.218	0.093	40.2	0.1123	0.0000	OK
15 minute winter	146	12	117.718	0.268	395.6	0.6626	0.0000	OK
15 minute winter	147	10	120.858	0.083	12.8	0.1294	0.0000	OK
15 minute winter	148	10	120.803	0.103	25.5	0.1526	0.0000	OK
15 minute winter	149	10	120.380	0.105	48.4	0.1957	0.0000	OK
15 minute winter	150	10	119.864	0.114	77.9	0.2343	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	126	1.033	127	254.9	3.294	0.221	2.4903	
30 minute winter	127	1.034	146	263.9	3.014	0.196	4.0587	
15 minute winter	128	29.000	129	13.1	1.371	0.419	0.0390	
15 minute winter	129	29.001	130	13.0	2.307	0.558	0.0171	
15 minute winter	130	29.002	131	13.0	0.458	0.001	0.1118	
15 minute winter	131	29.003	132	12.8	0.434	0.001	0.3461	
15 minute winter	132	29.004	133	12.9	0.383	0.001	0.2456	
15 minute winter	133	29.005	134	25.6	0.656	0.001	0.2300	
15 minute winter	134	29.006	135	25.6	0.627	0.002	0.5195	
15 minute winter	135	29.007	138	25.7	0.512	0.002	0.3879	
15 minute winter	136	30.000	137	10.6	2.033	0.031	0.0389	
15 minute winter	137	30.001	138	10.5	1.614	0.036	0.0505	
15 minute winter	138	29.008	139	35.9	0.285	0.003	1.0452	
15 minute winter	139	29.009	146	35.3	1.290	0.753	0.5723	
15 minute winter	140	31.000	141	42.3	2.588	0.144	0.0950	
15 minute winter	141	31.001	142	42.2	2.254	0.145	0.1447	
15 minute winter	142	31.002	143	52.4	2.084	0.264	0.8154	
15 minute winter	143	31.003	146	68.4	2.542	0.331	0.6286	
15 minute winter	144	32.000	145	35.9	2.450	0.305	0.1515	
15 minute winter	145	32.001	146	40.0	2.358	0.165	0.1350	
15 minute winter	146	1.035	153	397.2	3.486	0.364	5.1297	
15 minute winter	147	33.000	148	12.7	0.818	0.220	0.0948	
15 minute winter	148	33.001	149	25.0	1.465	0.394	0.4029	
15 minute winter	149	33.002	150	48.1	2.070	0.240	0.3786	
15 minute winter	150	33.003	151	77.3	2.436	0.309	1.1229	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	151	10	118.138	0.163	102.7	0.3139	0.0000	OK
15 minute winter	152	10	117.436	0.136	101.6	0.1538	0.0000	OK
15 minute winter	153	11	116.569	0.243	506.9	0.5142	0.0000	OK
15 minute winter	154	10	139.397	0.072	19.1	0.1241	0.0000	OK
15 minute winter	155	10	139.251	0.101	19.0	0.1144	0.0000	OK
15 minute winter	156	10	139.150	0.075	42.1	0.0826	0.0000	OK
15 minute winter	157	11	138.626	0.051	41.4	0.0000	0.0000	OK
15 minute winter	158	10	137.915	0.090	34.0	0.2190	0.0000	OK
15 minute winter	159	10	137.722	0.097	42.3	0.1629	0.0000	OK
15 minute winter	160	11	137.316	0.091	103.5	0.1001	0.0000	OK
15 minute winter	161	11	136.757	0.082	104.0	0.0000	0.0000	OK
15 minute winter	162	11	135.357	0.082	103.8	0.0000	0.0000	OK
15 minute winter	163	11	134.844	0.094	132.7	0.1414	0.0000	OK
15 minute winter	164	12	133.861	0.111	131.7	0.0000	0.0000	OK
15 minute winter	165	13	133.448	0.323	130.1	0.0000	0.0000	OK
15 minute winter	166	13	133.446	0.346	114.0	0.0000	0.0000	SURCHARGED
15 minute winter	167	10	136.088	0.138	141.0	0.7298	0.0000	OK
15 minute winter	168	14	132.744	0.218	139.4	0.3126	0.0000	OK
15 minute winter	169	14	132.736	0.436	232.4	0.0000	0.0000	OK
15 minute winter	170	15	132.730	0.480	203.7	0.0000	0.0000	OK
15 minute winter	171	15	132.730	0.505	183.8	0.4712	0.0000	OK
15 minute winter	172	15	132.511	0.311	179.3	0.0000	0.0000	OK
15 minute winter	173	15	132.508	0.333	177.8	0.0000	0.0000	OK
15 minute winter	174	10	132.676	0.176	42.5	0.4870	0.0000	OK
15 minute winter	175	10	132.673	0.273	83.8	0.7553	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	151	33.004	152	101.6	2.896	0.477	0.6502	
15 minute winter	152	33.005	153	101.0	3.667	0.306	0.2134	
15 minute winter	153	1.036	280	504.3	5.059	0.296	3.4798	
15 minute winter	154	34.000	155	19.0	1.132	0.110	0.1223	
15 minute winter	155	34.001	156	18.8	1.089	0.248	0.2789	
15 minute winter	156	34.002	157	41.4	0.560	0.005	2.5940	
15 minute winter	157	34.003	160	41.0	0.479	0.003	3.0210	
15 minute winter	158	35.000	159	33.8	1.588	0.103	0.1597	
15 minute winter	159	35.001	160	42.0	1.992	0.137	0.3637	
15 minute winter	160	34.004	161	104.0	0.952	0.007	1.7938	
15 minute winter	161	34.005	162	103.8	1.011	0.006	3.1586	
15 minute winter	162	34.006	163	102.7	0.920	0.006	1.3179	
15 minute winter	163	34.007	164	131.7	0.987	0.008	2.9467	
15 minute winter	164	34.008	165	130.1	0.488	0.011	9.7679	
15 minute winter	165	34.009	166	114.0	0.200	0.028	6.0203	
15 minute winter	166	Orifice	169	112.7				
15 minute winter	167	36.000	168	139.4	2.699	0.211	4.5224	
15 minute winter	168	36.001	169	138.8	1.783	0.284	1.1554	
15 minute winter	169	34.011	170	203.7	0.354	0.021	24.1980	
15 minute winter	170	34.012	171	178.5	0.230	0.020	14.7657	
15 minute winter	171	Head/Flow	172	179.3				
15 minute winter	172	34.014	173	177.8	0.365	0.013	3.3433	
15 minute winter	173	Head/Flow	176	179.4				
15 minute winter	174	37.000	175	41.3	0.767	0.321	0.4136	
15 minute winter	175	37.001	176	82.3	1.319	1.167	1.1430	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	176	13	132.290	0.140	228.2	0.0000	0.0000	OK
15 minute winter	177	10	131.176	0.176	42.5	0.4442	0.0000	OK
15 minute winter	178	13	130.975	0.275	58.9	0.5213	0.0000	OK
15 minute winter	179	13	130.975	0.325	286.7	0.1732	0.0000	OK
15 minute winter	180	10	137.761	0.161	85.1	0.6052	0.0000	OK
15 minute winter	181	10	136.586	0.186	125.5	0.4874	0.0000	OK
15 minute winter	182	10	136.376	0.151	125.0	0.2160	0.0000	OK
15 minute winter	183	10	135.545	0.170	42.5	0.4192	0.0000	OK
15 minute winter	184	10	135.447	0.197	65.5	0.3558	0.0000	OK
15 minute winter	185	11	135.196	0.171	188.8	0.2452	0.0000	OK
15 minute winter	186	10	133.911	0.111	42.5	0.2726	0.0000	OK
15 minute winter	187	10	133.558	0.158	56.9	0.2954	0.0000	OK
15 minute winter	188	10	134.093	0.143	85.1	0.5231	0.0000	OK
15 minute winter	189	10	133.676	0.151	116.5	0.3521	0.0000	OK
15 minute winter	190	10	133.305	0.280	366.1	0.5400	0.0000	OK
15 minute winter	191	11	132.445	0.245	386.3	0.5671	0.0000	OK
15 minute winter	192	11	130.791	0.291	414.4	0.6989	0.0000	OK
15 minute winter	193	11	130.552	0.602	692.6	1.7710	0.0000	OK
15 minute winter	194	13	130.044	0.644	687.0	0.0000	0.0000	OK
15 minute winter	195	10	130.230	0.130	42.5	0.3192	0.0000	OK
15 minute winter	196	13	130.046	0.471	58.1	0.9841	0.0000	SURCHARGED
15 minute winter	197	13	130.040	0.790	677.9	0.0000	0.0000	OK
15 minute winter	198	10	129.556	0.131	76.6	0.4832	0.0000	OK
15 minute winter	199	10	128.918	0.193	107.6	0.5770	0.0000	OK
15 minute winter	200	13	128.853	0.328	701.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	176	34.016	179	228.7	0.580	0.006	19.2885	
15 minute winter	177	38.000	178	41.9	1.359	0.801	0.2277	
15 minute winter	178	38.001	179	57.2	1.191	0.203	0.7328	
15 minute winter	179	34.017	193	280.4	1.403	0.326	5.1810	
15 minute winter	180	39.000	181	83.0	2.226	0.529	1.9822	
15 minute winter	181	39.001	182	125.0	2.314	0.241	0.3708	
15 minute winter	182	39.002	185	123.9	2.442	0.238	2.3601	
15 minute winter	183	40.000	184	42.1	1.449	0.709	0.1114	
15 minute winter	184	40.001	185	64.9	1.441	0.625	0.3856	
15 minute winter	185	39.003	190	189.1	3.544	0.286	2.3738	
15 minute winter	186	41.000	187	42.1	1.876	0.253	0.3265	
15 minute winter	187	41.001	190	56.1	1.348	0.328	0.8519	
15 minute winter	188	42.000	189	84.6	3.124	0.256	0.0852	
15 minute winter	189	42.001	190	116.2	2.756	0.176	0.3569	
15 minute winter	190	39.004	191	366.3	3.110	0.387	5.1685	
15 minute winter	191	39.005	192	390.4	3.798	0.318	5.2645	
15 minute winter	192	39.006	193	414.3	2.713	0.212	1.8558	
15 minute winter	193	34.018	194	687.0	1.891	0.851	10.0342	
15 minute winter	194	34.019	197	632.5	0.564	0.041	58.6453	
15 minute winter	195	43.000	196	41.9	1.857	0.559	0.5508	
15 minute winter	196	43.001	197	57.3	1.336	0.236	1.5020	
15 minute winter	197	Head/Flow	200	631.6				
15 minute winter	198	44.000	199	75.8	2.341	0.229	0.6536	
15 minute winter	199	44.001	200	106.0	1.372	0.227	1.4297	
15 minute winter	200	34.021	201	701.6	0.979	0.033	33.7398	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	14	128.380	0.380	701.6	0.0000	0.0000	OK
15 minute winter	202	16	128.265	0.640	688.5	0.0000	0.0000	OK
15 minute winter	203	10	136.304	0.104	48.9	0.2773	0.0000	OK
15 minute winter	204	10	134.684	0.208	42.5	0.5283	0.0000	OK
15 minute winter	205	10	134.521	0.171	48.1	0.2262	0.0000	OK
15 minute winter	206	10	134.266	0.116	104.5	0.1922	0.0000	OK
15 minute winter	207	10	132.581	0.181	144.3	0.4647	0.0000	OK
15 minute winter	208	10	132.312	0.187	147.1	0.2895	0.0000	OK
15 minute winter	209	11	132.051	0.201	188.9	0.5220	0.0000	OK
15 minute winter	210	10	131.575	0.125	72.3	0.4094	0.0000	OK
15 minute winter	211	11	130.902	0.227	265.9	0.4500	0.0000	OK
15 minute winter	212	11	130.126	0.226	275.5	0.4473	0.0000	OK
15 minute winter	213	10	130.117	0.117	25.5	0.2297	0.0000	OK
15 minute winter	214	11	129.724	0.274	308.6	0.5404	0.0000	OK
15 minute winter	215	10	134.655	0.080	34.0	0.1799	0.0000	OK
15 minute winter	216	10	133.947	0.097	42.3	0.1371	0.0000	OK
15 minute winter	217	10	132.665	0.140	42.5	0.3429	0.0000	OK
15 minute winter	218	10	132.503	0.153	92.0	0.2552	0.0000	OK
15 minute winter	219	10	133.216	0.091	27.6	0.1841	0.0000	OK
15 minute winter	220	10	132.292	0.192	246.4	0.9628	0.0000	OK
15 minute winter	221	11	129.233	0.408	591.2	1.4510	0.0000	OK
15 minute winter	222	11	128.793	0.343	635.4	1.1819	0.0000	OK
15 minute winter	223	10	128.935	0.085	42.5	0.2018	0.0000	OK
15 minute winter	224	10	128.423	0.098	63.6	0.2022	0.0000	OK
15 minute winter	225	11	127.722	0.597	1180.5	1.4811	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	34.022	202	688.5	0.709	0.044	83.1393	
15 minute winter	202	34.023	225	636.6	1.967	1.138	1.9876	
15 minute winter	203	45.000	206	48.2	2.756	0.412	0.6358	
15 minute winter	204	46.000	205	41.7	1.167	0.985	0.2657	
15 minute winter	205	46.001	206	47.8	1.254	0.502	0.2587	
15 minute winter	206	45.001	207	103.9	2.289	0.149	1.7258	
15 minute winter	207	45.002	208	142.8	2.357	0.236	0.4810	
15 minute winter	208	45.003	209	146.4	2.252	0.254	0.5683	
15 minute winter	209	45.004	211	188.8	2.883	0.376	2.7901	
15 minute winter	210	47.000	211	71.8	2.868	0.276	0.2192	
15 minute winter	211	45.005	212	267.5	2.910	0.267	3.0420	
15 minute winter	212	45.006	214	276.3	2.301	0.201	2.5308	
15 minute winter	213	48.000	214	25.2	1.303	0.441	0.1602	
15 minute winter	214	45.007	221	311.6	2.045	0.322	8.0379	
15 minute winter	215	49.000	216	33.8	2.333	0.252	0.1598	
15 minute winter	216	49.001	218	41.8	2.623	0.360	0.4365	
15 minute winter	217	50.000	218	42.0	1.421	0.357	0.2640	
15 minute winter	218	49.002	220	91.8	2.596	0.195	0.1130	
15 minute winter	219	51.000	220	27.1	1.867	0.320	0.4404	
15 minute winter	220	49.003	221	242.5	3.897	0.356	4.2132	
15 minute winter	221	45.008	222	595.4	2.702	0.493	8.6514	
15 minute winter	222	45.009	225	642.8	3.251	0.400	13.4747	
15 minute winter	223	52.000	224	42.3	2.890	0.129	0.0762	
15 minute winter	224	52.001	225	63.3	3.011	0.119	0.1808	
15 minute winter	225	34.024	226	1192.7	2.365	0.677	15.3437	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	226	13	126.926	0.951	1199.4	2.8014	0.0000	OK
15 minute winter	227	15	126.117	0.017	28.2	3.5878	0.0000	OK
15 minute winter	228	13	126.610	1.260	1192.2	3.8566	0.0000	SURCHARGED
15 minute winter	229	12	126.230	1.430	1192.8	4.6127	0.0000	SURCHARGED
30 minute winter	230	25	125.437	0.212	198.1	50.1970	0.0000	OK
15 minute winter	231	12	125.906	1.281	1209.7	3.9098	0.0000	SURCHARGED
15 minute winter	232	12	125.607	1.182	1041.9	3.4766	0.0000	SURCHARGED
15 minute winter	233	12	125.228	1.053	1156.5	6.2426	0.0000	SURCHARGED
15 minute winter	234	12	124.649	0.949	1169.8	3.4909	0.0000	OK
1440 minute winter	235	1470	124.388	0.738	97.0	0.8197	0.0000	SURCHARGED
1440 minute winter	236	1470	124.388	0.838	95.9	3046.4570	0.0000	SURCHARGED
1440 minute winter	237	1470	124.387	0.912	7.3	2.0054	0.0000	SURCHARGED
15 minute winter	238	10	123.624	0.074	23.4	0.1404	0.0000	OK
15 minute winter	239	10	122.330	0.105	51.3	0.2285	0.0000	OK
15 minute winter	240	10	128.350	0.100	34.0	0.2245	0.0000	OK
15 minute winter	241	10	127.010	0.110	50.2	0.2125	0.0000	OK
15 minute winter	242	10	126.547	0.172	66.2	0.3271	0.0000	OK
15 minute winter	243	10	127.734	0.059	14.0	0.0958	0.0000	OK
15 minute winter	244	10	127.237	0.062	13.9	0.0701	0.0000	OK
15 minute winter	245	11	126.477	0.227	98.4	0.4267	0.0000	OK
15 minute winter	246	11	126.213	0.138	116.8	0.2576	0.0000	OK
15 minute winter	247	11	125.259	0.159	197.9	0.6130	0.0000	OK
15 minute winter	248	10	124.013	0.063	17.0	0.1079	0.0000	OK
15 minute winter	249	10	123.554	0.079	21.2	0.1015	0.0000	OK
15 minute winter	250	11	122.825	0.225	226.5	0.3755	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	226	34.025	228	1184.2	2.215	0.635	8.8816	
15 minute winter	227	53.000	228	-28.2	-0.676	-0.268	0.2993	
15 minute winter	228	34.026	229	1180.4	1.634	0.762	11.8129	
15 minute winter	229	34.027	231	1201.9	1.615	1.252	9.7998	
30 minute winter	230	54.000	231	-198.1	-1.917	-0.649	0.8000	
15 minute winter	231	34.028	232	1035.3	1.391	1.066	10.9292	
15 minute winter	232	34.029	233	1039.9	1.397	1.099	14.3971	
15 minute winter	233	34.030	234	1153.2	1.620	1.428	17.7587	
15 minute winter	234	34.031	235	1164.2	1.500	1.807	19.3837	
1440 minute winter	235	34.032	236	94.8	0.082	0.371	166.9807	
1440 minute winter	236	34.033	237	7.3	-0.137	0.062	0.4729	
1440 minute winter	237	Depth/Flow	239	7.3				
15 minute winter	238	55.000	239	23.1	2.066	0.223	0.3345	
15 minute winter	239	34.035	252	51.1	2.267	0.126	0.1388	
15 minute winter	240	56.000	241	33.2	1.987	0.391	0.7543	
15 minute winter	241	56.001	242	49.7	1.939	0.168	0.5314	
15 minute winter	242	56.002	245	65.5	0.970	0.259	1.3785	
15 minute winter	243	57.000	244	13.9	2.084	0.293	0.0473	
15 minute winter	244	57.001	245	13.8	2.094	0.319	0.0703	
15 minute winter	245	56.003	246	98.7	1.637	0.502	2.8471	
15 minute winter	246	56.004	247	117.3	2.573	0.196	1.3114	
15 minute winter	247	56.005	250	198.2	3.078	0.276	3.2949	
15 minute winter	248	58.000	249	16.9	2.057	0.329	0.0474	
15 minute winter	249	58.001	250	21.0	2.356	0.470	0.0819	
15 minute winter	250	56.006	251	227.5	2.572	0.379	1.1585	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	251	11	122.417	0.267	245.5	0.5254	0.0000	OK
15 minute winter	252	11	121.702	0.177	299.5	0.4665	0.0000	OK
15 minute winter	253	11	120.576	0.201	313.6	0.5782	0.0000	OK
15 minute winter	254	11	119.166	0.191	335.3	0.5791	0.0000	OK
15 minute winter	255	1	124.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	256	1	124.325	0.000	0.0	0.0000	0.0000	OK
15 minute winter	257	11	123.795	0.020	8.5	0.0079	0.0000	OK
15 minute winter	258	11	122.279	0.029	16.1	0.0115	0.0000	OK
15 minute winter	259	12	121.330	0.030	15.9	0.0000	0.0000	OK
120 minute winter	260	96	119.912	0.087	5.4	0.0000	0.0000	OK
120 minute winter	261	98	119.912	0.312	5.0	0.0000	0.0000	SURCHARGED
15 minute winter	262	10	119.316	0.216	42.5	0.5448	0.0000	OK
15 minute winter	263	11	119.252	0.202	41.6	0.2281	0.0000	OK
15 minute winter	264	11	118.733	0.358	385.6	0.9686	0.0000	OK
15 minute winter	265	11	118.595	0.320	397.9	0.8972	0.0000	OK
15 minute winter	266	10	119.671	0.121	42.5	0.2985	0.0000	OK
15 minute winter	267	10	118.806	0.206	80.0	0.5185	0.0000	OK
15 minute winter	268	11	118.394	0.244	499.7	0.7472	0.0000	OK
15 minute winter	269	11	117.605	0.305	511.6	0.8669	0.0000	OK
15 minute winter	270	11	117.200	0.250	521.0	0.6970	0.0000	OK
15 minute winter	271	11	116.114	0.264	540.5	0.8009	0.0000	OK
15 minute winter	272	11	114.659	0.384	598.0	1.8877	0.0000	OK
15 minute winter	273	10	115.582	0.106	34.0	0.2193	0.0000	OK
15 minute winter	274	10	115.159	0.134	47.3	0.2344	0.0000	OK
15 minute winter	275	11	114.525	0.400	650.2	1.5443	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	251	56.007	252	246.1	2.933	0.436	0.6909	
15 minute winter	252	34.036	253	300.0	3.275	0.094	2.6296	
15 minute winter	253	34.037	254	315.3	3.268	0.122	5.1212	
15 minute winter	254	34.038	264	336.1	2.173	0.091	1.7578	
15 minute winter	255	59.000	256	0.0	0.000	0.000	0.0005	
15 minute winter	256	59.001	257	0.0	0.000	0.000	0.2453	
15 minute winter	257	59.002	258	8.0	0.307	0.001	1.1111	
15 minute winter	258	59.003	259	15.9	0.506	0.001	0.7472	
15 minute winter	259	59.004	260	15.3	0.422	0.001	1.6886	
120 minute winter	260	59.005	261	5.0	0.088	0.001	7.6538	
120 minute winter	261	Depth/Flow	264	1.6				
15 minute winter	262	60.000	263	41.6	1.082	0.847	0.2146	
15 minute winter	263	60.001	264	41.2	1.174	0.978	0.3962	
15 minute winter	264	34.039	265	385.9	1.871	0.292	2.9731	
15 minute winter	265	34.040	268	397.6	2.484	0.225	1.6222	
15 minute winter	266	61.000	267	41.8	1.982	0.524	0.6539	
15 minute winter	267	61.001	268	78.8	1.194	0.375	1.1667	
15 minute winter	268	34.041	269	499.6	3.223	0.162	3.5226	
15 minute winter	269	34.042	270	511.0	3.249	0.198	2.0894	
15 minute winter	270	34.043	271	520.5	3.685	0.174	4.3918	
15 minute winter	271	34.044	272	537.9	3.977	0.186	4.6152	
15 minute winter	272	34.045	275	596.8	1.814	0.121	5.0017	
15 minute winter	273	62.000	274	33.7	2.007	0.351	0.1117	
15 minute winter	274	62.001	275	47.0	1.299	0.155	0.3081	
15 minute winter	275	34.046	276	646.2	1.843	0.165	12.7269	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	276	11	114.321	0.421	682.2	1.8227	0.0000	OK
15 minute winter	277	10	116.311	0.061	21.3	0.1100	0.0000	OK
15 minute winter	278	10	115.886	0.061	25.5	0.0753	0.0000	OK
15 minute winter	279	12	114.165	0.390	708.2	1.4982	0.0000	OK
15 minute winter	280	12	113.982	0.457	1239.0	1.8441	0.0000	OK
15 minute winter	281	12	113.408	0.333	1257.9	1.3190	0.0000	OK
15 minute winter	282	10	115.252	0.077	21.3	0.1413	0.0000	OK
15 minute winter	283	10	114.895	0.070	25.5	0.0891	0.0000	OK
15 minute winter	284	10	114.007	0.107	33.7	0.1474	0.0000	OK
15 minute winter	285	10	113.864	0.164	49.2	0.2566	0.0000	OK
15 minute winter	286	11	113.656	0.131	57.1	0.1816	0.0000	OK
15 minute winter	287	12	112.432	0.582	1332.2	2.3686	0.0000	OK
15 minute winter	288	12	112.216	0.616	1364.6	2.6603	0.0000	OK
15 minute winter	289	12	112.028	0.553	1364.9	1.9149	0.0000	OK
15 minute winter	290	10	114.063	0.113	54.0	0.3085	0.0000	OK
15 minute winter	291	10	113.076	0.126	85.1	0.2948	0.0000	OK
15 minute winter	292	12	111.564	0.514	1448.8	2.4563	0.0000	OK
15 minute winter	293	10	112.208	0.108	29.8	0.2270	0.0000	OK
15 minute winter	294	10	112.103	0.128	33.9	0.1621	0.0000	OK
15 minute winter	295	12	111.321	0.721	1483.8	3.3487	0.0000	OK
15 minute winter	296	12	111.249	0.674	1479.3	0.0000	0.0000	OK
15 minute winter	297	10	111.669	0.069	19.1	0.1140	0.0000	OK
15 minute winter	298	10	111.368	0.043	19.0	0.0484	0.0000	OK
15 minute winter	299	14	110.974	0.524	1482.8	0.0000	0.0000	OK
15 minute winter	300	10	125.022	0.047	10.6	0.0688	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	276	34.047	279	680.9	1.967	0.174	6.9343	
15 minute winter	277	63.000	278	21.2	2.060	0.080	0.0772	
15 minute winter	278	63.001	279	25.3	2.557	0.083	0.1432	
15 minute winter	279	34.048	280	714.8	1.936	0.130	7.5060	
15 minute winter	280	1.037	281	1246.3	3.716	0.212	10.7772	
15 minute winter	281	1.038	287	1263.4	3.078	0.136	14.4378	
15 minute winter	282	64.000	283	21.2	1.878	0.217	0.1129	
15 minute winter	283	64.001	284	25.3	2.502	0.188	0.1300	
15 minute winter	284	64.002	285	33.5	1.084	0.227	0.3530	
15 minute winter	285	64.003	286	48.6	1.415	0.530	0.8811	
15 minute winter	286	64.004	287	57.2	1.987	0.372	1.0574	
15 minute winter	287	1.039	288	1336.7	2.278	0.265	14.2261	
15 minute winter	288	1.040	289	1364.9	2.507	0.297	5.7651	
15 minute winter	289	1.041	292	1364.3	3.294	0.253	3.2145	
15 minute winter	290	65.000	291	53.2	2.261	0.281	0.7538	
15 minute winter	291	65.001	292	84.4	2.736	0.214	0.6213	
15 minute winter	292	1.042	295	1449.4	2.124	0.140	16.5071	
15 minute winter	293	66.000	294	29.6	1.405	0.306	0.0769	
15 minute winter	294	66.001	295	33.6	1.609	0.461	0.1068	
15 minute winter	295	1.043	296	1479.3	1.846	0.434	9.8593	
15 minute winter	296	1.044	299	1471.2	0.913	0.164	104.5136	
15 minute winter	297	67.000	298	19.0	2.092	0.089	0.0691	
15 minute winter	298	67.001	299	18.9	2.815	0.044	0.2308	
15 minute winter	299	1.045	325	1419.7	0.865	0.076	53.2735	
15 minute winter	300	68.000	301	10.5	1.171	0.094	0.1703	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	124.204	0.079	27.5	0.1326	0.0000	OK
15 minute winter	302	10	123.578	0.078	27.3	0.0877	0.0000	OK
15 minute winter	303	10	122.718	0.118	58.9	0.2797	0.0000	OK
15 minute winter	304	10	122.419	0.219	92.6	0.5249	0.0000	OK
15 minute winter	305	11	122.264	0.264	129.1	0.6197	0.0000	OK
15 minute winter	306	10	128.551	0.101	25.5	0.1990	0.0000	OK
15 minute winter	307	10	128.192	0.092	30.3	0.1189	0.0000	OK
15 minute winter	308	10	127.593	0.093	36.4	0.1249	0.0000	OK
15 minute winter	309	10	127.034	0.084	12.8	0.1299	0.0000	OK
15 minute winter	310	11	126.979	0.154	55.2	0.2051	0.0000	OK
15 minute winter	311	10	126.934	0.059	17.0	0.0982	0.0000	OK
15 minute winter	312	10	126.677	0.077	28.0	0.1141	0.0000	OK
15 minute winter	313	11	126.291	0.116	94.0	0.1767	0.0000	OK
15 minute winter	314	10	124.206	0.081	21.3	0.1515	0.0000	OK
15 minute winter	315	10	123.550	0.075	33.9	0.1176	0.0000	OK
15 minute winter	316	11	121.993	0.193	280.1	0.3602	0.0000	OK
15 minute winter	317	11	120.200	0.250	281.1	0.3583	0.0000	OK
15 minute winter	318	11	119.805	0.155	281.5	0.0000	0.0000	OK
15 minute winter	319	11	119.630	0.155	281.6	0.0000	0.0000	OK
15 minute winter	320	12	119.406	0.456	281.5	0.0000	0.0000	OK
15 minute winter	321	12	118.034	0.133	273.7	0.0000	0.0000	OK
15 minute winter	322	13	117.004	0.454	274.3	0.0000	0.0000	OK
15 minute winter	323	13	115.211	0.436	261.3	0.0000	0.0000	OK
15 minute winter	324	13	113.226	0.451	261.5	0.0000	0.0000	OK
15 minute winter	325	14	110.927	0.727	1681.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	68.001	302	27.3	2.236	0.234	0.1531	
15 minute winter	302	68.002	303	27.1	2.331	0.229	0.1700	
15 minute winter	303	68.003	304	58.6	1.770	0.189	0.4672	
15 minute winter	304	68.004	305	91.3	1.059	0.455	4.4492	
15 minute winter	305	68.005	316	129.5	1.605	0.641	4.1109	
15 minute winter	306	69.000	307	25.2	1.554	0.377	0.3434	
15 minute winter	307	69.001	308	30.0	1.956	0.322	0.2879	
15 minute winter	308	69.002	310	36.2	1.630	0.363	0.4128	
15 minute winter	309	70.000	310	12.6	0.604	0.301	0.4035	
15 minute winter	310	69.003	313	54.9	1.960	0.752	0.8211	
15 minute winter	311	71.000	312	16.9	1.411	0.079	0.0903	
15 minute winter	312	71.001	313	27.8	1.437	0.146	0.2831	
15 minute winter	313	69.004	316	94.3	3.846	0.302	1.3291	
15 minute winter	314	72.000	315	21.1	2.289	0.497	0.1063	
15 minute winter	315	72.001	316	33.8	4.169	0.401	0.0504	
15 minute winter	316	68.006	317	281.1	3.618	0.373	2.6590	
15 minute winter	317	68.007	318	281.5	4.067	0.513	0.7272	
15 minute winter	318	68.008	319	281.6	1.240	0.020	1.1738	
15 minute winter	319	68.009	320	281.5	0.652	0.020	10.1367	
15 minute winter	320	Head/Flow	321	273.7				
15 minute winter	321	68.011	322	274.3	0.721	0.015	15.1631	
15 minute winter	322	Head/Flow	323	261.3				
15 minute winter	323	Head/Flow	324	261.5				
15 minute winter	324	Head/Flow	325	261.6				
15 minute winter	325	1.046	326	1634.8	1.108	0.572	43.8306	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	14	110.761	0.761	1634.8	7.1178	0.0000	OK
15 minute winter	327	15	110.498	0.923	1605.1	8.6262	0.0000	OK
15 minute winter	328	15	110.052	0.652	1592.6	0.0000	0.0000	SURCHARGED
15 minute winter	329	17	109.855	0.630	1563.9	0.0000	0.0000	SURCHARGED
15 minute winter	330	18	109.720	0.620	1466.0	0.0000	0.0000	SURCHARGED
1440 minute winter	331	1680	109.589	0.639	98.1	0.0000	0.0000	SURCHARGED
1440 minute winter	332	1680	109.589	0.739	95.3	2970.0820	0.0000	SURCHARGED
1440 minute winter	333	1680	109.588	0.788	7.5	0.8912	0.0000	SURCHARGED
15 minute winter	334	1	107.370	0.000	4.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	1.047	327	1605.1	0.992	0.617	101.0444	
15 minute winter	327	1.048	328	1592.6	1.845	0.958	21.4204	
15 minute winter	328	1.049	329	1563.9	0.864	5.044	172.6355	
15 minute winter	329	1.050	330	1466.0	0.896	4.651	115.6637	
15 minute winter	330	1.051	331	1435.2	0.862	4.622	136.8465	
1440 minute winter	331	1.052	332	95.3	0.080	0.297	105.4249	
1440 minute winter	332	1.053	333	7.5	0.107	0.135	1.3715	
1440 minute winter	333	Depth/Flow	334	7.5				545.0

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	9	141.750	0.075	16.0	0.1150	0.0000	OK
15 minute winter	2	10	141.714	0.289	140.5	1.1573	0.0000	OK
15 minute winter	3	10	142.251	0.126	64.7	0.3350	0.0000	OK
15 minute winter	4	11	141.547	0.297	216.6	0.4983	0.0000	OK
15 minute winter	5	10	141.506	0.306	69.5	0.8960	0.0000	SURCHARGED
15 minute winter	6	11	141.099	0.274	68.1	0.4835	0.0000	OK
15 minute winter	7	11	141.093	0.393	317.3	0.9635	0.0000	OK
15 minute winter	8	11	140.994	0.319	336.2	0.6771	0.0000	OK
15 minute winter	9	10	140.880	0.130	54.6	0.3148	0.0000	OK
15 minute winter	10	11	140.307	0.207	402.8	0.4197	0.0000	OK
15 minute winter	11	12	139.073	0.098	21.4	4.0755	0.0000	OK
15 minute winter	12	10	140.101	0.101	53.5	0.2604	0.0000	OK
15 minute winter	13	10	139.615	0.090	70.3	0.1621	0.0000	OK
15 minute winter	14	11	138.438	0.163	93.0	0.4439	0.0000	OK
15 minute winter	15	10	139.329	0.104	72.8	0.3113	0.0000	OK
15 minute winter	16	12	138.427	0.352	214.0	1.1007	0.0000	OK
15 minute winter	17	12	138.400	0.550	266.3	1.8297	0.0000	OK
15 minute winter	18	12	138.385	0.560	253.8	1.4428	0.0000	OK
15 minute winter	19	12	138.366	0.591	655.0	1.6166	0.0000	OK
15 minute winter	20	10	140.204	0.129	21.4	0.2209	0.0000	OK
15 minute winter	21	10	139.984	0.059	21.1	0.0662	0.0000	OK
15 minute winter	22	11	139.049	0.074	21.1	0.0000	0.0000	OK
15 minute winter	23	10	138.964	0.089	52.7	0.1152	0.0000	OK
15 minute winter	24	12	138.289	0.689	705.2	1.7825	0.0000	OK
15 minute winter	25	12	138.103	0.578	725.3	1.6288	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	16.0	0.973	0.128	0.1800	
15 minute winter	2	1.001	4	137.8	1.270	0.661	4.5321	
15 minute winter	3	2.000	4	64.4	2.230	0.348	0.8061	
15 minute winter	4	1.002	7	215.5	2.036	0.707	4.7534	
15 minute winter	5	3.000	6	68.1	1.713	1.078	0.1990	
15 minute winter	6	3.001	7	67.1	0.745	0.176	1.0140	
15 minute winter	7	1.003	8	318.1	1.827	0.709	1.0174	
15 minute winter	8	1.004	10	338.2	2.848	0.485	6.6891	
15 minute winter	9	4.000	10	54.0	1.964	0.334	0.4571	
15 minute winter	10	1.005	19	403.3	3.443	0.266	6.9144	
15 minute winter	11	5.000	14	14.9	0.929	0.371	0.4690	
15 minute winter	12	6.000	13	53.2	2.176	0.096	0.3947	
15 minute winter	13	6.001	14	69.9	3.311	0.074	0.2394	
15 minute winter	14	5.001	16	93.1	0.851	0.109	5.6060	
15 minute winter	15	7.000	16	72.2	2.740	0.105	0.4941	
15 minute winter	16	5.002	17	188.7	0.925	0.271	19.3257	
15 minute winter	17	5.003	18	252.0	0.869	0.323	2.1857	
15 minute winter	18	5.004	19	263.3	0.924	0.390	6.0452	
15 minute winter	19	1.006	24	648.3	1.626	0.499	6.3105	
15 minute winter	20	8.000	21	21.1	1.835	0.858	0.0885	
15 minute winter	21	8.001	22	21.1	3.000	0.312	0.0493	
15 minute winter	22	8.002	23	19.7	0.199	0.005	4.0911	
15 minute winter	23	8.003	24	53.3	3.291	0.325	0.1700	
15 minute winter	24	1.007	25	703.1	1.782	1.092	10.7959	
15 minute winter	25	1.008	26	724.5	2.669	1.174	11.6100	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	12	137.799	0.374	742.5	1.0599	0.0000	OK
15 minute winter	27	9	138.523	0.048	16.0	0.0748	0.0000	OK
15 minute winter	28	12	137.706	0.956	779.8	2.7299	0.0000	SURCHARGED
15 minute winter	29	12	137.459	0.809	818.6	2.5236	0.0000	SURCHARGED
15 minute winter	30	12	137.175	0.625	837.7	1.7938	0.0000	OK
15 minute winter	31	10	137.383	0.133	34.8	0.2514	0.0000	OK
15 minute winter	32	10	137.219	0.144	47.9	0.2032	0.0000	OK
15 minute winter	33	12	136.952	0.502	888.9	1.3780	0.0000	OK
15 minute winter	34	13	136.298	0.398	908.5	1.1590	0.0000	OK
15 minute winter	35	10	138.404	0.104	25.1	0.1831	0.0000	OK
15 minute winter	36	10	138.507	0.082	21.4	0.1362	0.0000	OK
15 minute winter	37	11	138.073	0.173	93.6	0.4019	0.0000	OK
15 minute winter	38	11	137.602	0.127	93.6	0.1877	0.0000	OK
15 minute winter	39	11	136.528	0.178	119.2	0.3455	0.0000	OK
15 minute winter	40	10	136.708	0.108	33.7	0.2020	0.0000	OK
15 minute winter	41	10	136.491	0.141	67.2	0.2950	0.0000	OK
15 minute winter	42	10	136.343	0.168	66.8	0.2961	0.0000	OK
15 minute winter	43	10	136.012	0.237	185.7	0.6037	0.0000	OK
15 minute winter	44	10	137.069	0.094	16.0	0.1479	0.0000	OK
15 minute winter	45	10	136.874	0.049	15.9	0.0555	0.0000	OK
15 minute winter	46	13	135.956	0.606	211.7	1.5424	0.0000	OK
15 minute winter	47	10	136.700	0.100	40.1	0.2002	0.0000	OK
15 minute winter	48	10	136.303	0.103	58.1	0.1507	0.0000	OK
15 minute winter	49	13	135.951	0.676	194.3	1.7202	0.0000	OK
15 minute winter	50	13	135.953	0.778	202.5	2.3799	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	26	1.009	28	744.0	1.993	0.229	3.2297	
15 minute winter	27	9.000	28	15.9	2.347	0.100	0.2965	
15 minute winter	28	1.010	29	780.9	1.774	1.320	19.0251	
15 minute winter	29	1.011	30	819.2	1.891	1.385	17.9822	
15 minute winter	30	1.012	33	838.6	2.370	0.971	7.1979	
15 minute winter	31	10.000	32	34.5	1.555	0.507	0.1298	
15 minute winter	32	10.001	33	47.4	1.505	0.401	0.4876	
15 minute winter	33	1.013	34	889.6	3.245	0.680	13.5115	
15 minute winter	34	1.014	54	902.0	2.699	0.297	4.2168	
15 minute winter	35	11.000	37	24.5	0.769	0.266	1.8518	
15 minute winter	36	12.000	37	21.1	0.741	0.166	1.1651	
15 minute winter	37	11.001	38	91.6	2.358	0.515	0.5336	
15 minute winter	38	11.002	39	94.0	3.016	0.220	0.7218	
15 minute winter	39	11.003	43	119.8	2.251	0.263	0.7407	
15 minute winter	40	13.000	41	33.5	1.663	0.196	0.0856	
15 minute winter	41	13.001	42	66.8	1.808	0.146	0.1864	
15 minute winter	42	13.002	43	66.0	1.152	0.210	2.3767	
15 minute winter	43	11.004	46	196.4	1.431	0.221	14.3585	
15 minute winter	44	14.000	45	15.9	1.913	0.534	0.0449	
15 minute winter	45	14.001	46	15.8	3.483	0.177	0.0146	
15 minute winter	46	11.005	49	157.5	0.865	0.184	11.4196	
15 minute winter	47	15.000	48	39.9	2.642	0.290	0.0708	
15 minute winter	48	15.001	49	57.9	3.144	0.167	0.0973	
15 minute winter	49	11.006	50	190.7	0.845	0.242	19.8535	
15 minute winter	50	11.007	53	238.4	0.728	0.293	9.9264	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	51	10	136.994	0.094	13.4	0.1405	0.0000	OK
15 minute winter	52	10	136.847	0.047	13.3	0.0535	0.0000	OK
15 minute winter	53	13	135.950	0.825	241.1	2.1005	0.0000	SURCHARGED
15 minute winter	54	13	135.944	0.869	1097.9	2.3861	0.0000	SURCHARGED
15 minute winter	55	13	135.558	0.558	1104.5	1.6530	0.0000	OK
15 minute winter	56	13	135.353	0.828	1097.9	2.3194	0.0000	SURCHARGED
15 minute winter	57	14	135.154	0.654	1098.2	1.7192	0.0000	OK
15 minute winter	58	14	134.910	0.435	1108.7	1.2326	0.0000	OK
15 minute winter	59	14	133.516	0.541	1136.6	1.6744	0.0000	OK
15 minute winter	60	10	134.116	0.166	50.8	0.4048	0.0000	OK
15 minute winter	61	10	133.843	0.093	50.3	0.1051	0.0000	OK
15 minute winter	62	14	133.200	0.400	1166.7	0.0000	0.0000	OK
15 minute winter	63	10	133.554	0.104	21.9	0.1767	0.0000	OK
15 minute winter	64	10	133.460	0.110	32.4	0.1548	0.0000	OK
15 minute winter	65	16	132.990	0.890	1175.3	0.0000	0.0000	OK
15 minute winter	66	10	133.044	0.169	42.8	0.3453	0.0000	OK
15 minute winter	67	10	132.855	0.180	58.2	0.2555	0.0000	OK
15 minute winter	68	10	132.746	0.171	71.2	0.2385	0.0000	OK
15 minute winter	69	10	132.501	0.101	70.8	0.1138	0.0000	OK
1440 minute winter	70	1500	131.883	0.658	69.6	0.0000	0.0000	OK
1440 minute winter	71	1500	131.883	0.733	69.5	0.0000	0.0000	SURCHARGED
1440 minute winter	72	1500	131.883	0.858	67.3	2147.1320	0.0000	SURCHARGED
1440 minute winter	73	1500	131.883	0.908	1.0	1.0269	0.0000	SURCHARGED
15 minute winter	74	10	130.883	0.058	22.8	0.1145	0.0000	OK
15 minute winter	75	10	130.014	0.089	26.7	0.1595	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	51	16.000	52	13.3	1.634	0.562	0.0464	
15 minute winter	52	16.001	53	13.2	2.929	0.186	0.0658	
15 minute winter	53	11.008	54	265.3	0.622	0.282	7.5580	
15 minute winter	54	1.015	55	1089.2	2.308	1.621	18.9457	
15 minute winter	55	1.016	56	1088.7	2.279	0.473	10.3903	
15 minute winter	56	1.017	57	1096.1	2.172	1.253	4.0302	
15 minute winter	57	1.018	58	1101.2	2.950	1.336	3.3952	
15 minute winter	58	1.019	59	1122.6	3.419	0.525	27.1566	
15 minute winter	59	1.020	62	1144.3	3.645	0.792	6.6108	
15 minute winter	60	17.000	61	50.3	1.779	0.687	0.1785	
15 minute winter	61	17.001	62	50.1	2.843	0.183	0.1246	
15 minute winter	62	1.021	65	1160.7	0.970	0.049	105.3428	
15 minute winter	63	18.000	64	21.7	1.171	0.338	0.1216	
15 minute winter	64	18.001	65	32.2	1.741	0.434	0.1597	
15 minute winter	65	Head/Flow	70	1098.3				
15 minute winter	66	19.000	67	42.2	1.408	0.788	0.3522	
15 minute winter	67	19.001	68	57.8	1.351	0.532	0.4479	
15 minute winter	68	19.002	69	70.8	2.283	0.476	0.3056	
15 minute winter	69	19.003	70	70.5	3.596	0.211	0.1426	
1440 minute winter	70	1.023	71	69.5	0.578	0.057	6.0089	
1440 minute winter	71	1.024	72	67.3	0.063	0.322	175.5541	
1440 minute winter	72	1.025	73	1.0	0.071	0.020	1.7184	
1440 minute winter	73	Depth/Flow	74	1.0				
15 minute winter	74	1.027	78	22.7	1.601	0.053	0.6182	
15 minute winter	75	20.000	76	26.6	1.591	0.156	0.1252	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	76	10	129.833	0.083	26.6	0.0942	0.0000	OK
15 minute winter	77	10	129.599	0.074	26.4	0.0836	0.0000	OK
15 minute winter	78	10	128.932	0.082	62.2	0.1400	0.0000	OK
15 minute winter	79	10	135.720	0.095	25.7	0.1705	0.0000	OK
15 minute winter	80	10	134.758	0.158	55.8	0.3008	0.0000	OK
15 minute winter	81	11	134.379	0.154	88.3	0.3436	0.0000	OK
15 minute winter	82	11	133.639	0.264	130.7	0.6532	0.0000	OK
15 minute winter	83	11	133.344	0.244	183.9	0.6668	0.0000	OK
15 minute winter	84	11	132.791	0.191	219.7	0.4358	0.0000	OK
15 minute winter	85	11	131.423	0.348	220.7	0.6148	0.0000	OK
15 minute winter	86	11	131.189	0.339	220.5	0.5983	0.0000	OK
15 minute winter	87	12	131.045	0.295	218.2	0.5213	0.0000	OK
15 minute winter	88	10	134.424	0.149	43.3	0.3384	0.0000	OK
15 minute winter	89	10	134.325	0.200	56.4	0.2947	0.0000	OK
15 minute winter	90	11	134.125	0.075	55.9	0.0000	0.0000	OK
15 minute winter	91	11	133.306	0.106	54.9	0.0000	0.0000	OK
15 minute winter	92	12	132.436	0.136	52.8	0.1543	0.0000	OK
15 minute winter	93	10	132.818	0.068	21.4	0.1149	0.0000	OK
15 minute winter	94	10	132.317	0.067	21.3	0.0759	0.0000	OK
15 minute winter	95	12	131.933	0.258	72.7	0.2917	0.0000	SURCHARGED
15 minute winter	96	1	133.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	97	1	132.575	0.000	0.0	0.0000	0.0000	OK
15 minute winter	98	12	131.686	0.061	71.6	0.0000	0.0000	OK
15 minute winter	99	13	130.868	0.443	315.0	0.5045	0.0000	OK
15 minute winter	100	13	130.845	0.470	298.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	76	20.001	77	26.4	1.800	0.137	0.1102	
15 minute winter	77	20.002	78	26.2	2.023	0.121	0.2054	
15 minute winter	78	1.028	119	61.7	3.634	0.094	0.2848	
15 minute winter	79	21.000	80	24.8	1.601	0.356	0.8272	
15 minute winter	80	21.001	81	55.0	1.527	0.499	1.1017	
15 minute winter	81	21.002	82	87.4	1.405	0.363	3.6942	
15 minute winter	82	21.003	83	130.0	1.656	0.756	2.1170	
15 minute winter	83	21.004	84	184.5	2.428	0.506	2.9966	
15 minute winter	84	21.005	85	220.7	2.737	0.387	3.8580	
15 minute winter	85	21.006	86	220.5	1.475	0.709	8.1217	
15 minute winter	86	21.007	87	218.2	1.605	0.686	3.1372	
15 minute winter	87	21.008	99	219.5	1.863	0.539	0.8324	
15 minute winter	88	22.000	89	43.0	1.303	0.482	0.1670	
15 minute winter	89	22.001	90	55.9	2.211	1.165	0.2141	
15 minute winter	90	22.002	91	54.9	0.491	0.005	5.6016	
15 minute winter	91	22.003	92	52.8	2.431	0.458	0.4023	
15 minute winter	92	22.004	95	53.2	1.505	0.683	0.9104	
15 minute winter	93	23.000	94	21.3	2.123	0.176	0.0932	
15 minute winter	94	23.001	95	21.2	1.072	0.195	0.3287	
15 minute winter	95	22.005	98	71.6	2.731	1.701	0.1840	
15 minute winter	96	24.000	97	0.0	0.000	0.000	0.0022	
15 minute winter	97	24.001	98	0.0	0.000	0.000	0.7086	
15 minute winter	98	22.006	99	71.7	0.206	0.004	10.6932	
15 minute winter	99	21.009	100	298.1	1.609	0.853	4.4109	
15 minute winter	100	21.010	101	275.3	0.460	0.088	17.4402	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	13	130.840	0.490	275.3	0.0000	0.0000	OK
15 minute winter	102	13	130.707	0.382	267.3	0.0000	0.0000	OK
15 minute winter	103	14	130.687	0.387	267.2	0.0000	0.0000	OK
15 minute winter	104	14	130.680	0.405	265.3	0.0000	0.0000	OK
15 minute winter	105	14	130.417	0.167	263.5	0.0000	0.0000	OK
15 minute winter	106	14	130.414	0.214	36.4	0.4467	0.0000	OK
15 minute winter	107	15	130.409	0.334	35.7	0.3778	0.0000	SURCHARGED
15 minute winter	108	15	130.407	0.457	277.2	0.0000	0.0000	OK
15 minute winter	109	15	129.741	0.141	274.2	0.0000	0.0000	OK
15 minute winter	110	16	128.592	0.442	274.5	0.0000	0.0000	OK
15 minute winter	111	16	127.796	0.146	265.4	0.0000	0.0000	OK
15 minute winter	112	10	127.657	0.082	32.1	0.1617	0.0000	OK
15 minute winter	113	17	127.612	0.337	42.6	0.4756	0.0000	SURCHARGED
15 minute winter	114	17	127.613	0.538	272.3	0.0000	0.0000	OK
15 minute winter	115	18	127.435	0.385	269.2	0.0000	0.0000	OK
15 minute winter	116	18	127.430	0.405	268.3	0.0000	0.0000	OK
15 minute winter	117	18	127.424	0.424	265.9	0.0000	0.0000	OK
15 minute winter	118	18	127.422	0.447	265.3	0.0000	0.0000	OK
15 minute winter	119	18	127.078	0.228	274.0	0.4414	0.0000	OK
30 minute winter	120	24	125.868	0.168	278.3	0.3380	0.0000	OK
30 minute winter	121	24	123.137	0.161	281.5	0.3073	0.0000	OK
15 minute winter	122	10	121.474	0.124	16.0	0.1944	0.0000	OK
15 minute winter	123	11	121.392	0.117	15.7	0.1319	0.0000	OK
30 minute winter	124	24	120.935	0.235	290.6	0.4423	0.0000	OK
15 minute winter	125	10	120.739	0.189	22.5	0.3313	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	Head/Flow	102	267.3				
15 minute winter	102	Depth/Flow	103	267.2				
15 minute winter	103	21.013	104	265.3	0.453	0.070	8.6868	
15 minute winter	104	Depth/Flow	105	263.5				
15 minute winter	105	21.015	108	263.0	0.483	0.023	9.0276	
15 minute winter	106	25.000	107	35.7	1.363	0.502	0.2646	
15 minute winter	107	25.001	108	34.3	1.361	0.635	0.1835	
15 minute winter	108	Depth/Flow	109	274.2				
15 minute winter	109	21.017	110	274.5	0.805	0.017	19.2179	
15 minute winter	110	Depth/Flow	111	265.4				
15 minute winter	111	21.019	114	265.3	0.445	0.018	12.4996	
15 minute winter	112	26.000	113	31.9	1.257	0.215	0.0915	
15 minute winter	113	26.001	114	42.2	1.223	1.015	0.3099	
15 minute winter	114	Depth/Flow	115	269.2				
15 minute winter	115	21.021	116	268.3	0.365	0.062	6.8086	
15 minute winter	116	21.022	117	265.9	0.290	0.071	9.7582	
15 minute winter	117	21.023	118	265.3	0.264	0.055	6.3785	
15 minute winter	118	21.024	119	266.0	1.633	1.183	2.0774	
15 minute winter	119	1.029	120	274.3	3.392	0.266	4.1709	
30 minute winter	120	1.030	121	278.1	4.436	0.159	2.6773	
30 minute winter	121	1.031	124	281.5	3.473	0.165	3.0425	
15 minute winter	122	27.000	123	15.7	1.043	0.846	0.1034	
15 minute winter	123	27.001	124	15.6	1.107	0.859	0.1688	
30 minute winter	124	1.032	126	290.6	2.887	0.283	3.2060	
15 minute winter	125	28.000	126	21.6	1.230	1.077	0.1337	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	126	22	120.233	0.233	311.5	0.4782	0.0000	OK
30 minute winter	127	21	119.296	0.196	324.1	0.4039	0.0000	OK
15 minute winter	128	10	121.992	0.092	16.6	0.1463	0.0000	OK
15 minute winter	129	10	121.867	0.092	16.5	0.1045	0.0000	OK
15 minute winter	130	10	121.755	0.030	16.4	0.0000	0.0000	OK
15 minute winter	131	10	121.605	0.030	16.3	0.0000	0.0000	OK
15 minute winter	132	11	121.208	0.033	16.1	0.0000	0.0000	OK
15 minute winter	133	10	121.013	0.038	32.5	0.0236	0.0000	OK
15 minute winter	134	11	120.643	0.043	32.2	0.0000	0.0000	OK
15 minute winter	135	11	120.091	0.041	32.2	0.0000	0.0000	OK
15 minute winter	136	10	120.917	0.042	13.4	0.0615	0.0000	OK
15 minute winter	137	10	120.219	0.044	13.3	0.0493	0.0000	OK
15 minute winter	138	11	119.735	0.060	45.0	0.0000	0.0000	OK
15 minute winter	139	11	119.651	0.176	45.2	0.0000	0.0000	OK
15 minute winter	140	10	120.601	0.101	53.5	0.2484	0.0000	OK
15 minute winter	141	10	120.193	0.093	53.3	0.1056	0.0000	OK
15 minute winter	142	10	119.695	0.120	66.5	0.1759	0.0000	OK
15 minute winter	143	10	118.696	0.146	87.4	0.2215	0.0000	OK
15 minute winter	144	10	118.833	0.108	45.5	0.2084	0.0000	OK
15 minute winter	145	10	118.231	0.106	50.5	0.1282	0.0000	OK
15 minute winter	146	12	117.761	0.311	505.0	0.7690	0.0000	OK
15 minute winter	147	10	120.871	0.096	16.0	0.1485	0.0000	OK
15 minute winter	148	10	120.818	0.118	31.9	0.1750	0.0000	OK
15 minute winter	149	10	120.395	0.120	60.7	0.2235	0.0000	OK
15 minute winter	150	10	119.879	0.129	97.8	0.2655	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	126	1.033	127	311.6	3.450	0.270	2.9001	
30 minute winter	127	1.034	146	323.9	3.163	0.240	4.8045	
15 minute winter	128	29.000	129	16.5	1.446	0.527	0.0465	
15 minute winter	129	29.001	130	16.4	2.431	0.701	0.0202	
15 minute winter	130	29.002	131	16.3	0.498	0.001	0.1294	
15 minute winter	131	29.003	132	16.1	0.472	0.001	0.4004	
15 minute winter	132	29.004	133	16.2	0.416	0.001	0.2843	
15 minute winter	133	29.005	134	32.2	0.712	0.002	0.2668	
15 minute winter	134	29.006	135	32.2	0.681	0.002	0.6024	
15 minute winter	135	29.007	138	32.3	0.554	0.002	0.4509	
15 minute winter	136	30.000	137	13.3	2.171	0.039	0.0461	
15 minute winter	137	30.001	138	13.3	1.691	0.046	0.0605	
15 minute winter	138	29.008	139	45.2	0.300	0.004	1.3021	
15 minute winter	139	29.009	146	44.2	1.334	0.944	0.6934	
15 minute winter	140	31.000	141	53.3	2.703	0.182	0.1145	
15 minute winter	141	31.001	142	53.1	2.368	0.182	0.1732	
15 minute winter	142	31.002	143	66.0	2.196	0.333	0.9753	
15 minute winter	143	31.003	146	86.2	2.686	0.418	0.7498	
15 minute winter	144	32.000	145	45.2	2.583	0.384	0.1807	
15 minute winter	145	32.001	146	50.3	2.488	0.207	0.1605	
15 minute winter	146	1.035	153	506.6	3.661	0.464	6.2280	
15 minute winter	147	33.000	148	15.9	0.855	0.275	0.1135	
15 minute winter	148	33.001	149	31.3	1.547	0.494	0.4786	
15 minute winter	149	33.002	150	60.4	2.187	0.302	0.4502	
15 minute winter	150	33.003	151	97.1	2.553	0.388	1.3424	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	151	10	118.165	0.190	129.2	0.3661	0.0000	OK
15 minute winter	152	10	117.459	0.158	127.9	0.1792	0.0000	OK
15 minute winter	153	11	116.608	0.283	646.7	0.5973	0.0000	OK
15 minute winter	154	10	139.407	0.082	24.1	0.1425	0.0000	OK
15 minute winter	155	10	139.264	0.114	24.0	0.1289	0.0000	OK
15 minute winter	156	10	139.160	0.085	53.1	0.0935	0.0000	OK
15 minute winter	157	11	138.633	0.058	52.0	0.0000	0.0000	OK
15 minute winter	158	10	137.927	0.102	42.8	0.2501	0.0000	OK
15 minute winter	159	10	137.734	0.109	53.3	0.1836	0.0000	OK
15 minute winter	160	11	137.329	0.104	130.5	0.1139	0.0000	OK
15 minute winter	161	11	136.769	0.094	131.3	0.0000	0.0000	OK
15 minute winter	162	11	135.369	0.094	131.3	0.0000	0.0000	OK
15 minute winter	163	11	134.858	0.108	168.2	0.1615	0.0000	OK
15 minute winter	164	11	133.876	0.126	167.3	0.0000	0.0000	OK
15 minute winter	165	13	133.510	0.385	164.1	0.0000	0.0000	OK
15 minute winter	166	13	133.509	0.409	140.1	0.0000	0.0000	SURCHARGED
15 minute winter	167	10	136.106	0.155	176.1	0.8198	0.0000	OK
30 minute winter	168	23	132.820	0.295	137.4	0.4217	0.0000	OK
15 minute winter	169	15	132.824	0.524	287.3	0.0000	0.0000	OK
15 minute winter	170	15	132.824	0.574	239.1	0.0000	0.0000	OK
15 minute winter	171	15	132.824	0.599	211.0	0.5587	0.0000	OK
15 minute winter	172	15	132.561	0.361	210.0	0.0000	0.0000	OK
15 minute winter	173	14	132.559	0.384	210.0	0.0000	0.0000	OK
15 minute winter	174	10	132.791	0.291	53.5	0.8056	0.0000	OK
15 minute winter	175	10	132.762	0.362	104.7	1.0002	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	151	33.004	152	127.9	3.011	0.601	0.7863	
15 minute winter	152	33.005	153	127.1	3.838	0.385	0.2565	
15 minute winter	153	1.036	280	643.0	5.347	0.377	4.1992	
15 minute winter	154	34.000	155	24.0	1.196	0.138	0.1458	
15 minute winter	155	34.001	156	23.7	1.162	0.314	0.3296	
15 minute winter	156	34.002	157	52.0	0.608	0.006	3.0102	
15 minute winter	157	34.003	160	51.8	0.517	0.003	3.5357	
15 minute winter	158	35.000	159	42.6	1.676	0.130	0.1905	
15 minute winter	159	35.001	160	53.0	2.097	0.173	0.4345	
15 minute winter	160	34.004	161	131.3	1.026	0.009	2.1035	
15 minute winter	161	34.005	162	131.3	1.089	0.008	3.7105	
15 minute winter	162	34.006	163	130.4	0.991	0.008	1.5519	
15 minute winter	163	34.007	164	167.3	1.061	0.010	3.4831	
15 minute winter	164	34.008	165	164.1	0.506	0.014	12.4980	
15 minute winter	165	34.009	166	140.1	0.203	0.035	7.8060	
15 minute winter	166	Orifice	169	138.1				
15 minute winter	167	36.000	168	174.3	2.790	0.264	5.9046	
30 minute winter	168	36.001	169	138.1	1.479	0.283	1.3289	
15 minute winter	169	34.011	170	239.1	0.354	0.025	32.6635	
15 minute winter	170	34.012	171	197.0	0.230	0.022	19.5882	
15 minute winter	171	Head/Flow	172	210.0				
15 minute winter	172	34.014	173	210.0	0.363	0.015	4.1652	
15 minute winter	173	Head/Flow	176	210.1				
15 minute winter	174	37.000	175	51.7	0.767	0.402	0.5260	
15 minute winter	175	37.001	176	103.4	1.484	1.468	1.2283	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	176	13	132.304	0.154	274.8	0.0000	0.0000	OK
15 minute winter	177	11	131.235	0.235	53.5	0.5925	0.0000	SURCHARGED
15 minute winter	178	12	131.014	0.314	72.6	0.5958	0.0000	OK
15 minute winter	179	12	131.013	0.363	350.0	0.1935	0.0000	OK
15 minute winter	180	10	137.787	0.187	106.9	0.7038	0.0000	OK
15 minute winter	181	10	136.614	0.214	157.9	0.5625	0.0000	OK
15 minute winter	182	10	136.397	0.172	157.3	0.2455	0.0000	OK
15 minute winter	183	10	135.581	0.206	53.5	0.5064	0.0000	OK
15 minute winter	184	10	135.482	0.232	82.3	0.4191	0.0000	OK
15 minute winter	185	11	135.221	0.196	237.6	0.2801	0.0000	OK
15 minute winter	186	10	133.928	0.127	53.5	0.3121	0.0000	OK
15 minute winter	187	10	133.581	0.181	71.7	0.3385	0.0000	OK
15 minute winter	188	10	134.117	0.167	106.9	0.6132	0.0000	OK
15 minute winter	189	10	133.696	0.171	146.5	0.3994	0.0000	OK
15 minute winter	190	10	133.348	0.323	461.0	0.6230	0.0000	OK
15 minute winter	191	10	132.478	0.278	485.7	0.6441	0.0000	OK
15 minute winter	192	11	130.860	0.360	519.7	0.8662	0.0000	OK
15 minute winter	193	12	130.718	0.768	869.4	2.2612	0.0000	OK
15 minute winter	194	14	130.201	0.801	849.0	0.0000	0.0000	OK
15 minute winter	195	12	130.267	0.167	53.5	0.4097	0.0000	OK
15 minute winter	196	14	130.203	0.628	73.9	1.3128	0.0000	SURCHARGED
15 minute winter	197	14	130.199	0.949	818.6	0.0000	0.0000	OK
15 minute winter	198	10	129.575	0.150	96.3	0.5517	0.0000	OK
15 minute winter	199	10	128.947	0.222	135.4	0.6631	0.0000	OK
15 minute winter	200	13	128.884	0.359	843.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	176	34.016	179	274.5	0.599	0.008	22.5692	
15 minute winter	177	38.000	178	51.2	1.385	0.979	0.2784	
15 minute winter	178	38.001	179	70.8	1.234	0.251	0.8350	
15 minute winter	179	34.017	193	342.8	1.446	0.398	6.8966	
15 minute winter	180	39.000	181	104.4	2.341	0.666	2.3712	
15 minute winter	181	39.001	182	157.3	2.426	0.304	0.4448	
15 minute winter	182	39.002	185	156.0	2.577	0.300	2.8161	
15 minute winter	183	40.000	184	52.9	1.517	0.891	0.1327	
15 minute winter	184	40.001	185	81.6	1.513	0.785	0.4606	
15 minute winter	185	39.003	190	238.0	3.753	0.360	2.8210	
15 minute winter	186	41.000	187	53.0	1.984	0.318	0.3888	
15 minute winter	187	41.001	190	70.7	1.426	0.413	1.0135	
15 minute winter	188	42.000	189	106.4	3.252	0.322	0.1027	
15 minute winter	189	42.001	190	146.1	2.753	0.221	0.4708	
15 minute winter	190	39.004	191	460.5	3.299	0.487	6.1877	
15 minute winter	191	39.005	192	489.5	3.881	0.398	6.5997	
15 minute winter	192	39.006	193	527.2	2.798	0.270	2.4366	
15 minute winter	193	34.018	194	849.0	1.907	1.051	12.3087	
15 minute winter	194	34.019	197	764.7	0.580	0.050	82.1906	
15 minute winter	195	43.000	196	53.6	1.904	0.714	0.6459	
15 minute winter	196	43.001	197	70.6	1.409	0.291	1.5020	
15 minute winter	197	Head/Flow	200	759.2				
15 minute winter	198	44.000	199	95.3	2.478	0.288	0.7768	
15 minute winter	199	44.001	200	133.5	1.428	0.286	1.6732	
15 minute winter	200	34.021	201	843.8	1.026	0.040	40.4798	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	16	128.444	0.444	843.8	0.0000	0.0000	OK
15 minute winter	202	16	128.408	0.783	795.0	0.0000	0.0000	SURCHARGED
15 minute winter	203	10	136.320	0.120	61.5	0.3188	0.0000	OK
15 minute winter	204	10	134.747	0.272	53.5	0.6882	0.0000	SURCHARGED
15 minute winter	205	10	134.548	0.198	60.6	0.2624	0.0000	OK
15 minute winter	206	10	134.280	0.130	131.6	0.2161	0.0000	OK
15 minute winter	207	10	132.611	0.210	181.7	0.5415	0.0000	OK
15 minute winter	208	10	132.343	0.218	185.2	0.3378	0.0000	OK
15 minute winter	209	11	132.081	0.231	237.8	0.6006	0.0000	OK
15 minute winter	210	10	131.594	0.144	90.9	0.4732	0.0000	OK
15 minute winter	211	11	130.936	0.261	335.0	0.5156	0.0000	OK
15 minute winter	212	11	130.161	0.261	346.6	0.5165	0.0000	OK
15 minute winter	213	10	130.136	0.136	32.1	0.2663	0.0000	OK
15 minute winter	214	11	129.768	0.318	388.3	0.6261	0.0000	OK
15 minute winter	215	10	134.666	0.091	42.8	0.2058	0.0000	OK
15 minute winter	216	10	133.962	0.112	53.3	0.1573	0.0000	OK
15 minute winter	217	10	132.686	0.161	53.5	0.3952	0.0000	OK
15 minute winter	218	10	132.527	0.177	115.9	0.2956	0.0000	OK
15 minute winter	219	10	133.229	0.103	34.8	0.2105	0.0000	OK
15 minute winter	220	10	132.320	0.220	310.3	1.1043	0.0000	OK
15 minute winter	221	11	129.300	0.475	744.2	1.6921	0.0000	OK
15 minute winter	222	11	128.845	0.395	801.5	1.3608	0.0000	OK
15 minute winter	223	10	128.947	0.097	53.5	0.2316	0.0000	OK
15 minute winter	224	10	128.437	0.112	79.9	0.2307	0.0000	OK
15 minute winter	225	12	128.136	1.011	1427.0	2.5094	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	34.022	202	795.0	0.699	0.051	115.2030	
15 minute winter	202	34.023	225	743.0	2.116	1.328	2.1957	
15 minute winter	203	45.000	206	60.7	2.912	0.518	0.7572	
15 minute winter	204	46.000	205	52.6	1.334	1.243	0.2834	
15 minute winter	205	46.001	206	60.2	1.326	0.633	0.3083	
15 minute winter	206	45.001	207	131.0	2.385	0.187	2.0841	
15 minute winter	207	45.002	208	179.9	2.427	0.298	0.5884	
15 minute winter	208	45.003	209	184.4	2.341	0.320	0.6884	
15 minute winter	209	45.004	211	237.5	3.043	0.473	3.3250	
15 minute winter	210	47.000	211	90.3	3.014	0.347	0.2623	
15 minute winter	211	45.005	212	336.5	3.075	0.335	3.6215	
15 minute winter	212	45.006	214	347.6	2.382	0.253	3.0741	
15 minute winter	213	48.000	214	31.7	1.373	0.555	0.1914	
15 minute winter	214	45.007	221	392.5	2.101	0.406	9.9603	
15 minute winter	215	49.000	216	42.6	2.452	0.317	0.1913	
15 minute winter	216	49.001	218	52.7	2.775	0.454	0.5197	
15 minute winter	217	50.000	218	53.0	1.501	0.450	0.3147	
15 minute winter	218	49.002	220	115.6	2.599	0.245	0.1432	
15 minute winter	219	51.000	220	34.2	1.979	0.404	0.5238	
15 minute winter	220	49.003	221	305.5	4.125	0.449	5.0158	
15 minute winter	221	45.008	222	751.0	2.903	0.622	10.3902	
15 minute winter	222	45.009	225	810.0	3.280	0.504	20.9745	
15 minute winter	223	52.000	224	53.3	3.042	0.162	0.0912	
15 minute winter	224	52.001	225	80.2	3.178	0.151	0.5566	
15 minute winter	225	34.024	226	1401.0	2.399	0.795	19.1105	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	226	12	127.396	1.421	1405.3	4.1841	0.0000	SURCHARGED
30 minute winter	227	25	126.201	0.101	90.2	22.9233	0.0000	OK
15 minute winter	228	11	127.004	1.654	1423.5	5.0614	0.0000	SURCHARGED
15 minute winter	229	11	126.562	1.762	1330.7	5.6819	0.0000	SURCHARGED
30 minute winter	230	26	125.652	0.427	348.1	110.6119	0.0000	OK
15 minute winter	231	11	126.175	1.550	1346.5	4.7298	0.0000	SURCHARGED
15 minute winter	232	11	125.826	1.401	1130.2	4.1195	0.0000	SURCHARGED
15 minute winter	233	11	125.381	1.206	1298.4	7.1510	0.0000	SURCHARGED
15 minute winter	234	12	124.699	0.999	1302.1	3.6743	0.0000	OK
1440 minute winter	235	1470	124.491	0.841	117.1	0.9343	0.0000	SURCHARGED
1440 minute winter	236	1470	124.491	0.941	115.6	3669.3120	0.0000	SURCHARGED
1440 minute winter	237	1470	124.490	1.015	10.2	2.2319	0.0000	SURCHARGED
15 minute winter	238	10	123.634	0.084	29.4	0.1592	0.0000	OK
15 minute winter	239	10	122.344	0.119	63.9	0.2601	0.0000	OK
15 minute winter	240	10	128.365	0.115	42.8	0.2575	0.0000	OK
15 minute winter	241	10	127.024	0.124	63.3	0.2399	0.0000	OK
15 minute winter	242	10	126.576	0.201	83.8	0.3810	0.0000	OK
15 minute winter	243	10	127.743	0.068	17.7	0.1102	0.0000	OK
15 minute winter	244	10	127.246	0.071	17.6	0.0806	0.0000	OK
15 minute winter	245	11	126.509	0.259	124.0	0.4862	0.0000	OK
15 minute winter	246	11	126.232	0.157	147.1	0.2935	0.0000	OK
15 minute winter	247	11	125.280	0.180	249.4	0.6940	0.0000	OK
15 minute winter	248	10	124.023	0.073	21.4	0.1245	0.0000	OK
15 minute winter	249	10	123.568	0.092	26.6	0.1182	0.0000	OK
15 minute winter	250	11	122.866	0.266	285.2	0.4444	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	226	34.025	228	1416.5	2.213	0.760	8.9109	
30 minute winter	227	53.000	228	-90.2	-1.856	-0.858	0.3620	
15 minute winter	228	34.026	229	1319.8	1.773	0.852	11.8129	
15 minute winter	229	34.027	231	1336.7	1.796	1.393	9.7998	
30 minute winter	230	54.000	231	-348.1	-2.775	-1.141	1.3198	
15 minute winter	231	34.028	232	1120.1	1.505	1.153	10.9292	
15 minute winter	232	34.029	233	1122.1	1.507	1.186	14.3971	
15 minute winter	233	34.030	234	1276.9	1.751	1.581	18.3018	
15 minute winter	234	34.031	235	1278.4	1.561	1.984	20.4254	
1440 minute winter	235	34.032	236	114.2	0.083	0.447	205.1454	
1440 minute winter	236	34.033	237	10.0	0.246	0.085	0.4729	
1440 minute winter	237	Depth/Flow	239	8.1				
15 minute winter	238	55.000	239	29.0	2.197	0.281	0.3958	
15 minute winter	239	34.035	252	63.6	2.384	0.157	0.1645	
15 minute winter	240	56.000	241	41.9	2.104	0.492	0.8980	
15 minute winter	241	56.001	242	62.9	1.983	0.213	0.6638	
15 minute winter	242	56.002	245	82.5	1.019	0.326	1.6500	
15 minute winter	243	57.000	244	17.6	2.192	0.370	0.0568	
15 minute winter	244	57.001	245	17.4	2.216	0.403	0.0839	
15 minute winter	245	56.003	246	124.4	1.736	0.632	3.3696	
15 minute winter	246	56.004	247	147.9	2.728	0.248	1.5595	
15 minute winter	247	56.005	250	249.6	3.193	0.348	3.9975	
15 minute winter	248	58.000	249	21.3	2.146	0.414	0.0571	
15 minute winter	249	58.001	250	26.4	2.470	0.589	0.0980	
15 minute winter	250	56.006	251	286.6	2.654	0.477	1.4123	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	251	11	122.464	0.314	309.3	0.6189	0.0000	OK
15 minute winter	252	11	121.725	0.200	376.4	0.5298	0.0000	OK
15 minute winter	253	11	120.600	0.225	394.1	0.6488	0.0000	OK
15 minute winter	254	11	119.198	0.223	421.4	0.6781	0.0000	OK
15 minute winter	255	1	124.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	256	1	124.325	0.000	0.0	0.0000	0.0000	OK
15 minute winter	257	11	123.798	0.023	10.7	0.0091	0.0000	OK
15 minute winter	258	11	122.283	0.033	20.5	0.0133	0.0000	OK
15 minute winter	259	12	121.334	0.034	20.2	0.0000	0.0000	OK
120 minute winter	260	96	119.946	0.121	6.7	0.0000	0.0000	OK
120 minute winter	261	98	119.946	0.345	5.5	0.0000	0.0000	SURCHARGED
15 minute winter	262	10	119.423	0.323	53.5	0.8149	0.0000	SURCHARGED
15 minute winter	263	11	119.323	0.273	51.7	0.3091	0.0000	SURCHARGED
15 minute winter	264	11	118.786	0.411	484.8	1.1135	0.0000	OK
15 minute winter	265	11	118.642	0.367	500.3	1.0279	0.0000	OK
15 minute winter	266	10	119.691	0.141	53.5	0.3476	0.0000	OK
15 minute winter	267	10	118.836	0.236	100.7	0.5959	0.0000	OK
15 minute winter	268	11	118.431	0.281	628.6	0.8591	0.0000	OK
15 minute winter	269	11	117.652	0.352	643.8	0.9996	0.0000	OK
15 minute winter	270	11	117.236	0.285	655.8	0.7965	0.0000	OK
15 minute winter	271	11	116.152	0.302	680.2	0.9162	0.0000	OK
15 minute winter	272	11	114.721	0.446	753.2	2.1925	0.0000	OK
15 minute winter	273	10	115.599	0.124	42.8	0.2545	0.0000	OK
15 minute winter	274	10	115.177	0.152	59.6	0.2665	0.0000	OK
15 minute winter	275	11	114.588	0.463	819.3	1.7850	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	251	56.007	252	310.0	3.070	0.549	0.8289	
15 minute winter	252	34.036	253	377.0	3.468	0.118	3.1197	
15 minute winter	253	34.037	254	396.2	3.388	0.153	6.2074	
15 minute winter	254	34.038	264	422.4	2.239	0.115	2.1331	
15 minute winter	255	59.000	256	0.0	0.000	0.000	0.0005	
15 minute winter	256	59.001	257	0.0	0.000	0.000	0.2848	
15 minute winter	257	59.002	258	10.2	0.335	0.001	1.2929	
15 minute winter	258	59.003	259	20.2	0.549	0.001	0.8759	
15 minute winter	259	59.004	260	19.5	0.455	0.001	2.1975	
120 minute winter	260	59.005	261	5.5	0.101	0.001	9.3284	
120 minute winter	261	Depth/Flow	264	1.7				
15 minute winter	262	60.000	263	51.7	1.300	1.052	0.2224	
15 minute winter	263	60.001	264	51.8	1.313	1.228	0.4280	
15 minute winter	264	34.039	265	485.2	1.964	0.367	3.5623	
15 minute winter	265	34.040	268	500.2	2.593	0.282	1.9535	
15 minute winter	266	61.000	267	52.6	2.083	0.660	0.7831	
15 minute winter	267	61.001	268	99.3	1.261	0.471	1.3888	
15 minute winter	268	34.041	269	628.7	3.346	0.204	4.2672	
15 minute winter	269	34.042	270	643.2	3.388	0.249	2.5215	
15 minute winter	270	34.043	271	655.0	3.856	0.219	5.2807	
15 minute winter	271	34.044	272	677.7	4.199	0.235	5.5036	
15 minute winter	272	34.045	275	752.0	1.865	0.152	6.1252	
15 minute winter	273	62.000	274	42.5	2.109	0.442	0.1338	
15 minute winter	274	62.001	275	59.1	1.378	0.195	0.3658	
15 minute winter	275	34.046	276	815.4	1.905	0.208	15.5286	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	276	11	114.387	0.487	860.7	2.1090	0.0000	OK
15 minute winter	277	10	116.319	0.069	26.7	0.1244	0.0000	OK
15 minute winter	278	10	115.894	0.069	31.9	0.0848	0.0000	OK
15 minute winter	279	11	114.230	0.455	891.8	1.7490	0.0000	OK
15 minute winter	280	12	114.049	0.524	1565.7	2.1133	0.0000	OK
15 minute winter	281	12	113.463	0.388	1590.2	1.5361	0.0000	OK
15 minute winter	282	10	115.263	0.088	26.7	0.1608	0.0000	OK
15 minute winter	283	10	114.904	0.079	31.8	0.1010	0.0000	OK
15 minute winter	284	10	114.025	0.125	42.3	0.1722	0.0000	OK
15 minute winter	285	10	113.890	0.190	61.9	0.2964	0.0000	OK
15 minute winter	286	11	113.675	0.150	71.8	0.2080	0.0000	OK
15 minute winter	287	12	112.535	0.684	1685.0	2.7865	0.0000	OK
15 minute winter	288	12	112.315	0.715	1727.6	3.0897	0.0000	OK
15 minute winter	289	12	112.111	0.636	1729.0	2.2023	0.0000	OK
15 minute winter	290	10	114.079	0.129	67.9	0.3520	0.0000	OK
15 minute winter	291	10	113.094	0.144	107.0	0.3364	0.0000	OK
15 minute winter	292	12	111.649	0.599	1835.0	2.8644	0.0000	OK
15 minute winter	293	10	112.228	0.128	37.4	0.2685	0.0000	OK
15 minute winter	294	10	112.124	0.149	42.4	0.1888	0.0000	OK
15 minute winter	295	12	111.399	0.799	1879.5	3.7142	0.0000	OK
15 minute winter	296	12	111.314	0.739	1877.5	0.0000	0.0000	OK
15 minute winter	297	10	111.679	0.079	24.1	0.1294	0.0000	OK
15 minute winter	298	10	111.373	0.048	24.0	0.0542	0.0000	OK
15 minute winter	299	14	111.077	0.627	1875.7	0.0000	0.0000	OK
15 minute winter	300	10	125.027	0.052	13.4	0.0773	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	276	34.047	279	855.8	2.020	0.218	8.5225	
15 minute winter	277	63.000	278	26.6	2.176	0.100	0.0916	
15 minute winter	278	63.001	279	31.7	2.718	0.104	0.1687	
15 minute winter	279	34.048	280	898.7	2.002	0.163	9.1305	
15 minute winter	280	1.037	281	1575.6	3.857	0.268	13.1003	
15 minute winter	281	1.038	287	1598.5	3.146	0.172	17.7991	
15 minute winter	282	64.000	283	26.5	1.980	0.272	0.1344	
15 minute winter	283	64.001	284	31.6	2.650	0.235	0.1538	
15 minute winter	284	64.002	285	42.1	1.124	0.285	0.4256	
15 minute winter	285	64.003	286	61.1	1.489	0.667	1.0510	
15 minute winter	286	64.004	287	71.8	2.100	0.467	1.2564	
15 minute winter	287	1.039	288	1692.4	2.367	0.336	17.3357	
15 minute winter	288	1.040	289	1729.0	2.647	0.376	6.9155	
15 minute winter	289	1.041	292	1728.9	3.497	0.321	3.8317	
15 minute winter	290	65.000	291	67.0	2.396	0.353	0.8951	
15 minute winter	291	65.001	292	106.2	2.896	0.270	0.7386	
15 minute winter	292	1.042	295	1836.1	2.283	0.177	19.4114	
15 minute winter	293	66.000	294	37.1	1.451	0.385	0.0934	
15 minute winter	294	66.001	295	42.2	1.689	0.578	0.1273	
15 minute winter	295	1.043	296	1877.5	2.065	0.551	11.1820	
15 minute winter	296	1.044	299	1856.4	0.961	0.207	127.5968	
15 minute winter	297	67.000	298	24.0	2.218	0.112	0.0823	
15 minute winter	298	67.001	299	23.9	2.931	0.056	0.2341	
15 minute winter	299	1.045	325	1754.7	0.874	0.094	70.0022	
15 minute winter	300	68.000	301	13.3	1.242	0.119	0.2028	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	124.215	0.090	34.7	0.1514	0.0000	OK
15 minute winter	302	10	123.589	0.088	34.4	0.1001	0.0000	OK
15 minute winter	303	10	122.735	0.135	74.2	0.3201	0.0000	OK
15 minute winter	304	10	122.456	0.255	116.6	0.6116	0.0000	OK
15 minute winter	305	11	122.306	0.306	162.4	0.7162	0.0000	OK
15 minute winter	306	10	128.566	0.116	32.1	0.2285	0.0000	OK
15 minute winter	307	10	128.205	0.105	38.2	0.1363	0.0000	OK
15 minute winter	308	10	127.606	0.106	45.8	0.1421	0.0000	OK
15 minute winter	309	10	127.045	0.095	16.0	0.1469	0.0000	OK
15 minute winter	310	11	127.015	0.190	69.3	0.2522	0.0000	OK
15 minute winter	311	10	126.942	0.067	21.4	0.1114	0.0000	OK
15 minute winter	312	10	126.688	0.088	35.2	0.1297	0.0000	OK
15 minute winter	313	11	126.306	0.131	117.8	0.2010	0.0000	OK
15 minute winter	314	10	124.219	0.094	26.7	0.1760	0.0000	OK
15 minute winter	315	10	123.562	0.087	42.5	0.1368	0.0000	OK
15 minute winter	316	11	122.022	0.222	352.0	0.4152	0.0000	OK
15 minute winter	317	11	120.239	0.289	353.2	0.4136	0.0000	OK
15 minute winter	318	11	119.825	0.175	353.8	0.0000	0.0000	OK
15 minute winter	319	11	119.650	0.175	353.9	0.0000	0.0000	OK
15 minute winter	320	12	119.521	0.571	353.9	0.0000	0.0000	OK
15 minute winter	321	12	118.051	0.151	342.6	0.0000	0.0000	OK
15 minute winter	322	13	117.114	0.564	343.1	0.0000	0.0000	OK
15 minute winter	323	13	115.315	0.540	324.2	0.0000	0.0000	OK
15 minute winter	324	13	113.334	0.559	324.2	0.0000	0.0000	OK
15 minute winter	325	14	111.047	0.847	2078.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	68.001	302	34.4	2.358	0.295	0.1831	
15 minute winter	302	68.002	303	34.1	2.472	0.288	0.2021	
15 minute winter	303	68.003	304	73.8	1.789	0.238	0.5995	
15 minute winter	304	68.004	305	114.7	1.111	0.572	5.3239	
15 minute winter	305	68.005	316	162.9	1.691	0.806	4.8979	
15 minute winter	306	69.000	307	31.8	1.637	0.474	0.4105	
15 minute winter	307	69.001	308	37.8	2.068	0.405	0.3427	
15 minute winter	308	69.002	310	45.5	1.689	0.457	0.5014	
15 minute winter	309	70.000	310	15.8	0.626	0.377	0.4904	
15 minute winter	310	69.003	313	68.9	2.013	0.944	1.0024	
15 minute winter	311	71.000	312	21.3	1.483	0.100	0.1081	
15 minute winter	312	71.001	313	35.0	1.515	0.183	0.3370	
15 minute winter	313	69.004	316	118.2	4.076	0.379	1.5729	
15 minute winter	314	72.000	315	26.5	2.386	0.624	0.1279	
15 minute winter	315	72.001	316	42.3	4.366	0.502	0.0603	
15 minute winter	316	68.006	317	353.2	3.801	0.468	3.1745	
15 minute winter	317	68.007	318	353.8	4.295	0.645	0.8615	
15 minute winter	318	68.008	319	353.9	1.325	0.025	1.3802	
15 minute winter	319	68.009	320	353.9	0.656	0.025	14.0919	
15 minute winter	320	Head/Flow	321	342.6				
15 minute winter	321	68.011	322	343.1	0.741	0.019	20.9121	
15 minute winter	322	Head/Flow	323	324.2				
15 minute winter	323	Head/Flow	324	324.2				
15 minute winter	324	Head/Flow	325	324.2				
15 minute winter	325	1.046	326	2002.3	1.157	0.701	52.4480	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	14	110.889	0.889	2002.3	8.3060	0.0000	OK
15 minute winter	327	15	110.615	1.040	1972.1	9.7249	0.0000	OK
15 minute winter	328	15	110.115	0.715	1950.3	0.0000	0.0000	SURCHARGED
15 minute winter	329	17	109.918	0.693	1920.9	0.0000	0.0000	SURCHARGED
15 minute winter	330	18	109.783	0.683	1818.4	0.0000	0.0000	SURCHARGED
1440 minute winter	331	1680	109.676	0.726	117.6	0.0000	0.0000	SURCHARGED
1440 minute winter	332	1680	109.676	0.826	113.9	3589.0210	0.0000	SURCHARGED
1440 minute winter	333	1680	109.674	0.874	8.3	0.9885	0.0000	SURCHARGED
15 minute winter	334	1	107.370	0.000	4.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	1.047	327	1972.1	1.013	0.758	118.4158	
15 minute winter	327	1.048	328	1950.3	2.064	1.173	24.2315	
15 minute winter	328	1.049	329	1920.9	0.891	6.195	201.7039	
15 minute winter	329	1.050	330	1818.4	0.914	5.769	134.8802	
15 minute winter	330	1.051	331	1754.7	0.910	5.651	156.3007	
1440 minute winter	331	1.052	332	113.9	0.086	0.355	127.5465	
1440 minute winter	332	1.053	333	8.3	0.118	0.149	1.3715	
1440 minute winter	333	Depth/Flow	334	8.3				592.8

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	141.805	0.130	22.5	0.1983	0.0000	OK
15 minute winter	2	11	141.806	0.381	195.5	1.5285	0.0000	OK
15 minute winter	3	10	142.274	0.149	90.6	0.3972	0.0000	OK
15 minute winter	4	11	141.646	0.396	299.7	0.6634	0.0000	OK
15 minute winter	5	10	141.668	0.468	97.4	1.3713	0.0000	SURCHARGED
15 minute winter	6	11	141.197	0.372	95.4	0.6572	0.0000	OK
15 minute winter	7	11	141.190	0.489	440.6	1.2007	0.0000	OK
15 minute winter	8	11	141.068	0.393	466.9	0.8345	0.0000	OK
15 minute winter	9	10	140.910	0.160	76.4	0.3877	0.0000	OK
15 minute winter	10	11	140.347	0.246	559.0	0.5006	0.0000	OK
15 minute winter	11	12	139.099	0.124	30.0	5.1687	0.0000	OK
15 minute winter	12	10	140.121	0.120	74.9	0.3119	0.0000	OK
15 minute winter	13	10	139.634	0.109	98.5	0.1955	0.0000	OK
15 minute winter	14	12	138.993	0.718	134.6	1.9574	0.0000	OK
15 minute winter	15	10	139.348	0.123	101.8	0.3669	0.0000	OK
15 minute winter	16	13	138.958	0.883	296.0	2.7605	0.0000	SURCHARGED
15 minute winter	17	13	138.943	1.093	327.3	3.6344	0.0000	SURCHARGED
15 minute winter	18	13	138.931	1.106	382.5	2.8500	0.0000	SURCHARGED
15 minute winter	19	13	138.916	1.141	790.6	3.1227	0.0000	SURCHARGED
15 minute winter	20	11	140.367	0.292	30.0	0.5009	0.0000	SURCHARGED
15 minute winter	21	11	139.995	0.070	28.8	0.0789	0.0000	OK
15 minute winter	22	12	139.064	0.089	28.8	0.0000	0.0000	OK
15 minute winter	23	13	138.996	0.121	72.9	0.1574	0.0000	OK
15 minute winter	24	13	138.778	1.178	847.2	3.0507	0.0000	SURCHARGED
15 minute winter	25	13	138.559	1.034	875.2	2.9125	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	21.4	0.977	0.172	0.3469	
15 minute winter	2	1.001	4	189.5	1.325	0.908	6.0723	
15 minute winter	3	2.000	4	90.1	2.259	0.486	1.2437	
15 minute winter	4	1.002	7	298.0	2.139	0.977	6.2734	
15 minute winter	5	3.000	6	95.4	2.398	1.509	0.2005	
15 minute winter	6	3.001	7	94.0	0.797	0.247	1.4030	
15 minute winter	7	1.003	8	441.5	1.987	0.984	1.2928	
15 minute winter	8	1.004	10	468.7	3.068	0.673	8.5572	
15 minute winter	9	4.000	10	75.6	2.123	0.468	0.5919	
15 minute winter	10	1.005	19	559.6	3.377	0.369	8.8003	
15 minute winter	11	5.000	14	24.0	0.994	0.598	0.8541	
15 minute winter	12	6.000	13	74.5	2.370	0.134	0.5122	
15 minute winter	13	6.001	14	97.9	3.605	0.104	0.9921	
15 minute winter	14	5.001	16	136.8	0.883	0.160	18.2274	
15 minute winter	15	7.000	16	104.2	2.922	0.151	1.7378	
15 minute winter	16	5.002	17	298.0	0.934	0.428	30.9823	
15 minute winter	17	5.003	18	381.3	0.956	0.489	2.7530	
15 minute winter	18	5.004	19	400.2	1.062	0.594	7.3425	
15 minute winter	19	1.006	24	788.3	1.791	0.607	6.9843	
15 minute winter	20	8.000	21	28.8	1.946	1.170	0.1009	
15 minute winter	21	8.001	22	28.8	3.166	0.427	0.0629	
15 minute winter	22	8.002	23	27.5	0.215	0.007	5.5403	
15 minute winter	23	8.003	24	69.5	3.341	0.424	0.2347	
15 minute winter	24	1.007	25	855.5	1.944	1.329	12.0672	
15 minute winter	25	1.008	26	880.3	2.562	1.427	17.5102	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	26	13	138.261	0.836	898.9	2.3696	0.0000	SURCHARGED
15 minute winter	27	10	138.532	0.057	22.5	0.0881	0.0000	OK
15 minute winter	28	13	138.104	1.353	938.6	3.8655	0.0000	SURCHARGED
15 minute winter	29	13	137.744	1.094	980.3	3.4138	0.0000	SURCHARGED
15 minute winter	30	13	137.357	0.807	1002.0	2.3168	0.0000	SURCHARGED
15 minute winter	31	10	137.419	0.169	48.7	0.3190	0.0000	OK
15 minute winter	32	10	137.253	0.178	67.0	0.2514	0.0000	OK
15 minute winter	33	13	137.046	0.596	1056.5	1.6337	0.0000	OK
15 minute winter	34	13	136.500	0.600	1080.8	1.7502	0.0000	OK
15 minute winter	35	10	138.426	0.125	35.2	0.2200	0.0000	OK
15 minute winter	36	10	138.523	0.098	30.0	0.1623	0.0000	OK
15 minute winter	37	11	138.122	0.222	131.3	0.5148	0.0000	OK
15 minute winter	38	11	137.628	0.153	131.2	0.2269	0.0000	OK
15 minute winter	39	11	136.568	0.218	166.7	0.4246	0.0000	OK
15 minute winter	40	10	136.732	0.132	47.2	0.2475	0.0000	OK
15 minute winter	41	10	136.522	0.172	94.1	0.3593	0.0000	OK
15 minute winter	42	10	136.377	0.202	93.7	0.3570	0.0000	OK
15 minute winter	43	13	136.376	0.601	260.1	1.5297	0.0000	OK
15 minute winter	44	10	137.096	0.121	22.5	0.1895	0.0000	OK
15 minute winter	45	10	136.885	0.060	22.3	0.0681	0.0000	OK
15 minute winter	46	13	136.377	1.027	285.4	2.6141	0.0000	SURCHARGED
15 minute winter	47	10	136.725	0.125	56.2	0.2507	0.0000	OK
15 minute winter	48	13	136.353	0.153	81.4	0.2244	0.0000	OK
15 minute winter	49	13	136.364	1.089	243.9	2.7704	0.0000	SURCHARGED
15 minute winter	50	13	136.343	1.168	265.1	3.5732	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	26	1.009	28	901.6	2.049	0.277	4.3110	
15 minute winter	27	9.000	28	22.4	2.546	0.141	0.3076	
15 minute winter	28	1.010	29	941.6	2.140	1.591	19.0251	
15 minute winter	29	1.011	30	983.0	2.234	1.661	19.0251	
15 minute winter	30	1.012	33	1004.1	2.426	1.163	8.3180	
15 minute winter	31	10.000	32	48.3	1.668	0.709	0.1689	
15 minute winter	32	10.001	33	66.3	1.626	0.561	0.6316	
15 minute winter	33	1.013	34	1055.3	3.245	0.807	18.4968	
15 minute winter	34	1.014	54	1097.0	2.670	0.361	5.0941	
15 minute winter	35	11.000	37	34.4	0.815	0.373	2.4272	
15 minute winter	36	12.000	37	29.6	0.787	0.234	1.5294	
15 minute winter	37	11.001	38	128.4	2.512	0.721	0.7001	
15 minute winter	38	11.002	39	131.5	3.247	0.307	0.9372	
15 minute winter	39	11.003	43	167.8	2.432	0.368	1.2162	
15 minute winter	40	13.000	41	46.9	1.798	0.274	0.1109	
15 minute winter	41	13.001	42	93.7	1.958	0.205	0.2412	
15 minute winter	42	13.002	43	92.3	1.260	0.294	4.8380	
15 minute winter	43	11.004	46	263.2	1.464	0.296	27.4889	
15 minute winter	44	14.000	45	22.3	2.075	0.749	0.0588	
15 minute winter	45	14.001	46	22.2	3.756	0.248	0.0364	
15 minute winter	46	11.005	49	220.7	0.886	0.259	13.7244	
15 minute winter	47	15.000	48	55.9	2.825	0.406	0.0926	
15 minute winter	48	15.001	49	81.2	3.360	0.234	0.2205	
15 minute winter	49	11.006	50	249.6	0.866	0.317	21.4154	
15 minute winter	50	11.007	53	271.7	0.729	0.334	10.0442	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	51	10	137.018	0.118	18.7	0.1770	0.0000	OK
15 minute winter	52	9	136.854	0.054	18.4	0.0616	0.0000	OK
15 minute winter	53	13	136.327	1.202	277.4	3.0590	0.0000	SURCHARGED
15 minute winter	54	13	136.311	1.236	1359.7	3.3937	0.0000	SURCHARGED
15 minute winter	55	13	135.860	0.860	1379.0	2.5479	0.0000	SURCHARGED
15 minute winter	56	13	135.528	1.003	1391.6	2.8082	0.0000	SURCHARGED
15 minute winter	57	13	135.282	0.782	1395.8	2.0558	0.0000	OK
15 minute winter	58	13	134.994	0.519	1410.8	1.4702	0.0000	OK
15 minute winter	59	14	133.607	0.632	1439.5	1.9549	0.0000	OK
15 minute winter	60	10	134.205	0.255	71.1	0.6230	0.0000	SURCHARGED
15 minute winter	61	10	133.861	0.111	69.0	0.1254	0.0000	OK
15 minute winter	62	14	133.247	0.447	1469.8	0.0000	0.0000	OK
15 minute winter	63	10	133.580	0.130	30.7	0.2218	0.0000	OK
15 minute winter	64	10	133.486	0.136	45.5	0.1917	0.0000	OK
15 minute winter	65	16	133.224	1.124	1494.5	0.0000	0.0000	OK
15 minute winter	66	10	133.157	0.282	59.9	0.5756	0.0000	SURCHARGED
15 minute winter	67	10	132.905	0.229	81.1	0.3258	0.0000	OK
15 minute winter	68	10	132.788	0.213	99.2	0.2969	0.0000	OK
15 minute winter	69	10	132.522	0.122	98.5	0.1375	0.0000	OK
1440 minute winter	70	1500	132.092	0.867	98.1	0.0000	0.0000	SURCHARGED
1440 minute winter	71	1500	132.092	0.942	98.0	0.0000	0.0000	SURCHARGED
1440 minute winter	72	1500	132.092	1.067	94.4	3015.3930	0.0000	SURCHARGED
1440 minute winter	73	1500	132.092	1.117	2.5	1.2629	0.0000	SURCHARGED
15 minute winter	74	10	130.893	0.068	31.8	0.1346	0.0000	OK
15 minute winter	75	10	130.033	0.108	37.4	0.1938	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	51	16.000	52	18.4	1.775	0.780	0.0582	
15 minute winter	52	16.001	53	19.4	3.112	0.274	0.0729	
15 minute winter	53	11.008	54	299.7	0.687	0.319	7.5609	
15 minute winter	54	1.015	55	1357.4	2.546	2.020	22.0360	
15 minute winter	55	1.016	56	1378.7	2.586	0.599	12.0888	
15 minute winter	56	1.017	57	1391.5	2.610	1.591	4.3149	
15 minute winter	57	1.018	58	1395.7	3.108	1.693	4.0270	
15 minute winter	58	1.019	59	1411.5	3.568	0.660	32.6900	
15 minute winter	59	1.020	62	1433.1	3.882	0.992	7.7343	
15 minute winter	60	17.000	61	69.0	1.837	0.942	0.2287	
15 minute winter	61	17.001	62	68.7	3.083	0.251	0.1577	
15 minute winter	62	1.021	65	1470.7	0.996	0.063	151.6207	
15 minute winter	63	18.000	64	30.5	1.245	0.474	0.1603	
15 minute winter	64	18.001	65	45.1	1.882	0.608	0.2071	
15 minute winter	65	Head/Flow	70	1386.5				
15 minute winter	66	19.000	67	58.6	1.477	1.094	0.4524	
15 minute winter	67	19.001	68	80.6	1.449	0.742	0.5823	
15 minute winter	68	19.002	69	98.5	2.443	0.662	0.3943	
15 minute winter	69	19.003	70	98.0	3.907	0.293	0.2158	
1440 minute winter	70	1.023	71	98.0	0.636	0.080	6.6988	
1440 minute winter	71	1.024	72	94.4	0.104	0.452	264.3792	
1440 minute winter	72	1.025	73	2.5	0.195	0.049	1.7184	
1440 minute winter	73	Depth/Flow	74	1.2				
15 minute winter	74	1.027	78	31.6	1.744	0.074	0.7927	
15 minute winter	75	20.000	76	37.2	1.706	0.219	0.1636	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	76	10	129.851	0.101	37.2	0.1141	0.0000	OK
15 minute winter	77	10	129.614	0.089	37.0	0.1003	0.0000	OK
15 minute winter	78	10	128.948	0.098	87.0	0.1678	0.0000	OK
15 minute winter	79	10	135.740	0.115	35.9	0.2070	0.0000	OK
15 minute winter	80	10	134.798	0.198	78.9	0.3760	0.0000	OK
15 minute winter	81	11	134.412	0.187	123.5	0.4161	0.0000	OK
15 minute winter	82	11	133.763	0.388	182.9	0.9603	0.0000	SURCHARGED
15 minute winter	83	11	133.401	0.301	252.5	0.8210	0.0000	OK
15 minute winter	84	11	132.829	0.229	301.2	0.5211	0.0000	OK
15 minute winter	85	11	131.533	0.458	302.2	0.8093	0.0000	OK
15 minute winter	86	11	131.284	0.434	302.3	0.7665	0.0000	OK
15 minute winter	87	12	131.111	0.361	299.0	0.6375	0.0000	OK
15 minute winter	88	11	134.556	0.281	60.7	0.6380	0.0000	SURCHARGED
15 minute winter	89	11	134.435	0.310	76.8	0.4574	0.0000	SURCHARGED
15 minute winter	90	11	134.141	0.090	76.5	0.0000	0.0000	OK
15 minute winter	91	12	133.333	0.133	76.3	0.0000	0.0000	OK
15 minute winter	92	12	132.737	0.437	72.3	0.4938	0.0000	SURCHARGED
15 minute winter	93	10	132.833	0.083	30.0	0.1393	0.0000	OK
15 minute winter	94	10	132.330	0.080	29.9	0.0905	0.0000	OK
15 minute winter	95	12	132.118	0.443	94.5	0.5008	0.0000	SURCHARGED
15 minute winter	96	1	133.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	97	1	132.575	0.000	0.0	0.0000	0.0000	OK
15 minute winter	98	12	131.697	0.072	94.8	0.0000	0.0000	OK
15 minute winter	99	13	131.043	0.618	428.1	0.7048	0.0000	SURCHARGED
15 minute winter	100	14	131.002	0.627	388.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	76	20.001	77	37.0	1.941	0.192	0.1431	
15 minute winter	77	20.002	78	36.7	2.212	0.169	0.2633	
15 minute winter	78	1.028	119	86.3	3.968	0.132	0.3648	
15 minute winter	79	21.000	80	35.6	1.682	0.510	1.1279	
15 minute winter	80	21.001	81	77.2	1.644	0.702	1.4355	
15 minute winter	81	21.002	82	122.6	1.476	0.509	4.8546	
15 minute winter	82	21.003	83	177.0	1.724	1.029	2.7954	
15 minute winter	83	21.004	84	251.9	2.597	0.691	3.8132	
15 minute winter	84	21.005	85	302.2	2.757	0.530	5.2617	
15 minute winter	85	21.006	86	302.3	1.547	0.972	10.6102	
15 minute winter	86	21.007	87	299.0	1.710	0.940	4.0203	
15 minute winter	87	21.008	99	300.2	2.007	0.737	1.0840	
15 minute winter	88	22.000	89	58.3	1.465	0.653	0.2039	
15 minute winter	89	22.001	90	76.5	2.388	1.596	0.2407	
15 minute winter	90	22.002	91	76.3	0.529	0.008	7.1714	
15 minute winter	91	22.003	92	72.3	2.469	0.627	0.5929	
15 minute winter	92	22.004	95	71.3	1.794	0.916	1.1150	
15 minute winter	93	23.000	94	29.9	2.309	0.246	0.1203	
15 minute winter	94	23.001	95	29.7	1.137	0.274	0.3488	
15 minute winter	95	22.005	98	94.8	3.144	2.253	0.1921	
15 minute winter	96	24.000	97	0.0	0.000	0.000	0.0022	
15 minute winter	97	24.001	98	0.0	0.000	0.000	0.8520	
15 minute winter	98	22.006	99	94.5	0.206	0.005	17.9884	
15 minute winter	99	21.009	100	388.9	1.673	1.113	5.4079	
15 minute winter	100	21.010	101	358.9	0.472	0.115	27.7021	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	14	131.000	0.650	358.9	0.0000	0.0000	OK
15 minute winter	102	14	130.825	0.500	349.9	0.0000	0.0000	OK
15 minute winter	103	15	130.805	0.505	349.9	0.0000	0.0000	OK
15 minute winter	104	15	130.802	0.527	344.1	0.0000	0.0000	OK
15 minute winter	105	15	130.531	0.281	342.6	0.0000	0.0000	OK
15 minute winter	106	12	130.547	0.347	50.9	0.7236	0.0000	SURCHARGED
15 minute winter	107	15	130.536	0.461	46.2	0.5216	0.0000	SURCHARGED
15 minute winter	108	16	130.532	0.582	352.2	0.0000	0.0000	OK
15 minute winter	109	16	129.760	0.160	349.5	0.0000	0.0000	OK
15 minute winter	110	17	128.717	0.567	350.0	0.0000	0.0000	OK
15 minute winter	111	17	127.817	0.167	340.0	0.0000	0.0000	OK
15 minute winter	112	18	127.760	0.184	44.9	0.3623	0.0000	OK
15 minute winter	113	18	127.760	0.485	59.4	0.6838	0.0000	SURCHARGED
15 minute winter	114	18	127.760	0.685	346.3	0.0000	0.0000	OK
30 minute winter	115	27	127.546	0.496	335.5	0.0000	0.0000	OK
30 minute winter	116	27	127.543	0.518	332.8	0.0000	0.0000	OK
30 minute winter	117	27	127.540	0.540	327.1	0.0000	0.0000	OK
30 minute winter	118	27	127.539	0.564	323.3	0.0000	0.0000	OK
30 minute winter	119	25	127.110	0.260	344.3	0.5026	0.0000	OK
30 minute winter	120	24	125.890	0.190	349.4	0.3831	0.0000	OK
30 minute winter	121	24	123.157	0.182	354.2	0.3457	0.0000	OK
15 minute winter	122	11	121.625	0.275	22.5	0.4315	0.0000	SURCHARGED
15 minute winter	123	11	121.484	0.209	21.1	0.2367	0.0000	SURCHARGED
30 minute winter	124	22	120.972	0.272	371.1	0.5117	0.0000	OK
15 minute winter	125	11	120.904	0.354	31.5	0.6196	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	Head/Flow	102	349.9				
15 minute winter	102	Depth/Flow	103	349.9				
15 minute winter	103	21.013	104	344.1	0.456	0.090	13.1835	
15 minute winter	104	Depth/Flow	105	342.6				
15 minute winter	105	21.015	108	338.4	0.481	0.030	14.3474	
15 minute winter	106	25.000	107	46.2	1.399	0.650	0.2670	
15 minute winter	107	25.001	108	44.6	1.397	0.824	0.1835	
15 minute winter	108	Depth/Flow	109	349.5				
15 minute winter	109	21.017	110	350.0	0.818	0.021	27.6476	
15 minute winter	110	Depth/Flow	111	340.0				
15 minute winter	111	21.019	114	339.9	0.403	0.023	18.1015	
15 minute winter	112	26.000	113	44.4	1.300	0.298	0.1383	
15 minute winter	113	26.001	114	57.7	1.451	1.389	0.3099	
15 minute winter	114	Depth/Flow	115	342.4				
30 minute winter	115	21.021	116	332.8	0.322	0.077	10.0842	
30 minute winter	116	21.022	117	327.1	0.276	0.088	14.3655	
30 minute winter	117	21.023	118	323.3	0.253	0.067	9.3138	
30 minute winter	118	21.024	119	323.1	1.626	1.436	2.5152	
30 minute winter	119	1.029	120	344.3	3.570	0.334	4.9732	
30 minute winter	120	1.030	121	349.4	4.705	0.200	3.1723	
30 minute winter	121	1.031	124	354.3	3.662	0.208	3.6461	
15 minute winter	122	27.000	123	21.1	1.201	1.137	0.1205	
15 minute winter	123	27.001	124	21.1	1.198	1.163	0.2044	
30 minute winter	124	1.032	126	371.1	3.027	0.362	3.9360	
15 minute winter	125	28.000	126	30.3	1.723	1.510	0.1365	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	126	21	120.274	0.274	409.3	0.5625	0.0000	OK
30 minute winter	127	21	119.329	0.229	428.9	0.4720	0.0000	OK
15 minute winter	128	10	122.022	0.122	23.2	0.1932	0.0000	OK
15 minute winter	129	10	121.895	0.120	23.0	0.1354	0.0000	OK
15 minute winter	130	10	121.761	0.036	22.8	0.0000	0.0000	OK
15 minute winter	131	10	121.612	0.037	22.7	0.0000	0.0000	OK
15 minute winter	132	11	121.215	0.040	22.5	0.0000	0.0000	OK
15 minute winter	133	10	121.021	0.046	45.4	0.0287	0.0000	OK
15 minute winter	134	11	120.652	0.052	45.1	0.0000	0.0000	OK
15 minute winter	135	11	120.100	0.050	45.0	0.0000	0.0000	OK
15 minute winter	136	10	120.925	0.050	18.7	0.0731	0.0000	OK
15 minute winter	137	10	120.226	0.051	18.6	0.0580	0.0000	OK
15 minute winter	138	12	119.794	0.119	63.0	0.0000	0.0000	OK
15 minute winter	139	13	119.794	0.319	66.3	0.0000	0.0000	SURCHARGED
15 minute winter	140	10	120.624	0.124	74.9	0.3050	0.0000	OK
15 minute winter	141	10	120.215	0.115	74.6	0.1296	0.0000	OK
15 minute winter	142	10	119.721	0.146	93.1	0.2144	0.0000	OK
15 minute winter	143	10	118.731	0.181	122.4	0.2758	0.0000	OK
15 minute winter	144	10	118.860	0.135	63.7	0.2603	0.0000	OK
15 minute winter	145	10	118.255	0.130	70.8	0.1575	0.0000	OK
15 minute winter	146	11	117.838	0.388	705.0	0.9603	0.0000	OK
15 minute winter	147	10	120.895	0.120	22.5	0.1859	0.0000	OK
15 minute winter	148	10	120.848	0.148	44.8	0.2194	0.0000	OK
15 minute winter	149	10	120.423	0.148	85.2	0.2753	0.0000	OK
15 minute winter	150	10	119.906	0.156	137.1	0.3226	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	126	1.033	127	409.3	3.658	0.354	3.5929	
30 minute winter	127	1.034	146	428.8	3.341	0.318	6.1019	
15 minute winter	128	29.000	129	23.0	1.511	0.736	0.0621	
15 minute winter	129	29.001	130	22.8	2.483	0.977	0.0267	
15 minute winter	130	29.002	131	22.7	0.561	0.002	0.1602	
15 minute winter	131	29.003	132	22.5	0.531	0.002	0.4975	
15 minute winter	132	29.004	133	22.7	0.469	0.002	0.3536	
15 minute winter	133	29.005	134	45.1	0.800	0.002	0.3323	
15 minute winter	134	29.006	135	45.0	0.765	0.003	0.7500	
15 minute winter	135	29.007	138	45.2	0.615	0.003	0.8325	
15 minute winter	136	30.000	137	18.6	2.376	0.055	0.0588	
15 minute winter	137	30.001	138	18.6	1.813	0.064	0.1236	
15 minute winter	138	29.008	139	66.3	0.313	0.005	3.0060	
15 minute winter	139	29.009	146	50.5	1.337	1.077	0.7843	
15 minute winter	140	31.000	141	74.6	2.864	0.255	0.1514	
15 minute winter	141	31.001	142	74.4	2.533	0.255	0.2265	
15 minute winter	142	31.002	143	92.4	2.351	0.466	1.2736	
15 minute winter	143	31.003	146	120.8	2.892	0.585	0.9753	
15 minute winter	144	32.000	145	63.3	2.773	0.537	0.2355	
15 minute winter	145	32.001	146	70.5	2.685	0.291	0.2086	
15 minute winter	146	1.035	153	699.7	3.875	0.641	8.2176	
15 minute winter	147	33.000	148	22.3	0.906	0.387	0.1502	
15 minute winter	148	33.001	149	44.0	1.666	0.694	0.6243	
15 minute winter	149	33.002	150	84.7	2.360	0.423	0.5850	
15 minute winter	150	33.003	151	136.2	2.672	0.544	1.7698	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	151	10	118.226	0.251	181.1	0.4837	0.0000	OK
15 minute winter	152	10	117.502	0.202	178.6	0.2288	0.0000	OK
15 minute winter	153	11	116.679	0.354	906.0	0.7478	0.0000	OK
15 minute winter	154	10	139.427	0.101	33.7	0.1755	0.0000	OK
15 minute winter	155	10	139.287	0.137	33.5	0.1552	0.0000	OK
15 minute winter	156	10	139.177	0.102	74.3	0.1117	0.0000	OK
15 minute winter	157	11	138.645	0.070	72.6	0.0000	0.0000	OK
15 minute winter	158	10	137.950	0.125	59.9	0.3053	0.0000	OK
15 minute winter	159	10	137.756	0.131	74.6	0.2200	0.0000	OK
15 minute winter	160	11	137.350	0.125	183.9	0.1372	0.0000	OK
15 minute winter	161	11	136.789	0.114	184.2	0.0000	0.0000	OK
15 minute winter	162	11	135.389	0.114	184.6	0.0000	0.0000	OK
15 minute winter	163	11	134.880	0.130	237.0	0.1954	0.0000	OK
15 minute winter	164	11	133.902	0.152	236.5	0.0000	0.0000	OK
15 minute winter	165	14	133.651	0.526	233.3	0.0000	0.0000	OK
15 minute winter	166	14	133.651	0.551	181.8	0.0000	0.0000	SURCHARGED
15 minute winter	167	10	136.136	0.186	244.6	0.9789	0.0000	OK
30 minute winter	168	23	132.997	0.472	190.4	0.6749	0.0000	SURCHARGED
30 minute winter	169	23	132.985	0.685	315.9	0.0000	0.0000	OK
30 minute winter	170	23	132.984	0.734	282.2	0.0000	0.0000	OK
30 minute winter	171	23	132.984	0.758	269.4	0.7077	0.0000	OK
30 minute winter	172	23	132.652	0.452	264.8	0.0000	0.0000	OK
30 minute winter	173	23	132.651	0.476	265.2	0.0000	0.0000	OK
15 minute winter	174	10	133.036	0.536	74.9	1.4821	0.0000	SURCHARGED
15 minute winter	175	10	132.976	0.576	146.5	1.5925	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	151	33.004	152	178.6	3.135	0.839	1.0524	
15 minute winter	152	33.005	153	178.1	4.072	0.539	0.3372	
15 minute winter	153	1.036	280	902.6	5.728	0.529	5.4883	
15 minute winter	154	34.000	155	33.5	1.283	0.193	0.1897	
15 minute winter	155	34.001	156	33.1	1.269	0.439	0.4218	
15 minute winter	156	34.002	157	72.6	0.682	0.008	3.7480	
15 minute winter	157	34.003	160	72.7	0.577	0.005	4.4543	
15 minute winter	158	35.000	159	59.6	1.803	0.182	0.2479	
15 minute winter	159	35.001	160	74.2	2.264	0.242	0.5621	
15 minute winter	160	34.004	161	184.2	1.139	0.013	2.6573	
15 minute winter	161	34.005	162	184.6	1.209	0.011	4.6971	
15 minute winter	162	34.006	163	184.1	1.103	0.011	1.9704	
15 minute winter	163	34.007	164	236.5	1.176	0.015	4.4448	
15 minute winter	164	34.008	165	233.3	0.527	0.019	19.3632	
15 minute winter	165	34.009	166	181.8	0.215	0.045	12.6326	
15 minute winter	166	Orifice	169	176.9				
15 minute winter	167	36.000	168	242.2	2.927	0.367	8.6368	
30 minute winter	168	36.001	169	174.8	1.524	0.358	1.5687	
30 minute winter	169	34.011	170	282.2	0.305	0.030	49.8479	
30 minute winter	170	34.012	171	247.3	0.239	0.027	29.2444	
30 minute winter	171	Head/Flow	172	264.8				
30 minute winter	172	34.014	173	265.2	0.364	0.019	5.8609	
30 minute winter	173	Head/Flow	176	265.9				
15 minute winter	174	37.000	175	72.5	1.029	0.564	0.5281	
15 minute winter	175	37.001	176	144.7	2.054	2.053	1.2817	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	176	12	132.327	0.177	355.3	0.0000	0.0000	OK
15 minute winter	177	13	131.439	0.439	74.9	1.1080	0.0000	SURCHARGED
15 minute winter	178	13	131.356	0.655	103.6	1.2447	0.0000	SURCHARGED
15 minute winter	179	13	131.352	0.702	456.9	0.3744	0.0000	OK
15 minute winter	180	10	137.846	0.246	149.7	0.9228	0.0000	OK
15 minute winter	181	10	136.666	0.266	220.2	0.6992	0.0000	OK
15 minute winter	182	10	136.434	0.209	219.5	0.2995	0.0000	OK
15 minute winter	183	10	135.767	0.392	74.9	0.9658	0.0000	SURCHARGED
15 minute winter	184	10	135.602	0.352	113.9	0.6362	0.0000	SURCHARGED
15 minute winter	185	11	135.258	0.233	330.7	0.3339	0.0000	OK
15 minute winter	186	10	133.957	0.157	74.9	0.3833	0.0000	OK
15 minute winter	187	10	133.624	0.224	100.6	0.4181	0.0000	OK
15 minute winter	188	10	134.165	0.215	149.7	0.7885	0.0000	OK
15 minute winter	189	10	133.739	0.214	205.1	0.4999	0.0000	OK
15 minute winter	190	10	133.432	0.407	645.9	0.7851	0.0000	OK
15 minute winter	191	10	132.529	0.329	680.8	0.7632	0.0000	OK
15 minute winter	192	12	131.360	0.860	726.5	2.0671	0.0000	SURCHARGED
15 minute winter	193	13	131.243	1.293	1049.8	3.8057	0.0000	SURCHARGED
15 minute winter	194	14	130.397	0.997	1001.6	0.0000	0.0000	OK
15 minute winter	195	11	130.674	0.574	74.9	1.4088	0.0000	SURCHARGED
15 minute winter	196	14	130.401	0.826	94.3	1.7272	0.0000	SURCHARGED
15 minute winter	197	14	130.396	1.146	963.0	0.0000	0.0000	OK
15 minute winter	198	10	129.608	0.183	134.7	0.6769	0.0000	OK
15 minute winter	199	10	128.997	0.272	189.6	0.8126	0.0000	OK
15 minute winter	200	13	128.918	0.393	1018.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	176	34.016	179	353.6	0.616	0.010	56.2880	
15 minute winter	177	38.000	178	73.6	1.851	1.407	0.2943	
15 minute winter	178	38.001	179	101.4	1.268	0.359	1.0375	
15 minute winter	179	34.017	193	533.0	1.508	0.619	10.7187	
15 minute winter	180	39.000	181	145.4	2.471	0.927	3.1359	
15 minute winter	181	39.001	182	219.5	2.584	0.424	0.5818	
15 minute winter	182	39.002	185	217.7	2.821	0.418	3.6019	
15 minute winter	183	40.000	184	72.7	1.829	1.226	0.1530	
15 minute winter	184	40.001	185	112.9	1.611	1.087	0.5778	
15 minute winter	185	39.003	190	331.3	3.862	0.501	3.9190	
15 minute winter	186	41.000	187	74.4	2.081	0.447	0.5244	
15 minute winter	187	41.001	190	99.1	1.544	0.578	1.3117	
15 minute winter	188	42.000	189	149.0	3.433	0.450	0.1352	
15 minute winter	189	42.001	190	204.4	2.764	0.310	0.7097	
15 minute winter	190	39.004	191	645.6	3.592	0.683	7.9344	
15 minute winter	191	39.005	192	681.7	3.823	0.555	11.2004	
15 minute winter	192	39.006	193	704.2	2.810	0.360	3.3060	
15 minute winter	193	34.018	194	1001.6	1.962	1.240	12.7760	
15 minute winter	194	34.019	197	893.7	0.571	0.058	116.8525	
15 minute winter	195	43.000	196	67.5	1.941	0.900	0.7198	
15 minute winter	196	43.001	197	90.7	1.380	0.374	1.5020	
15 minute winter	197	Head/Flow	200	916.5				
15 minute winter	198	44.000	199	133.5	2.681	0.403	1.0054	
15 minute winter	199	44.001	200	187.2	1.582	0.401	2.0612	
15 minute winter	200	34.021	201	1019.5	1.069	0.048	74.3225	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	17	128.741	0.741	1019.5	0.0000	0.0000	OK
15 minute winter	202	16	128.735	1.110	1032.6	0.0000	0.0000	SURCHARGED
15 minute winter	203	10	136.350	0.150	86.1	0.3999	0.0000	OK
15 minute winter	204	10	134.883	0.408	74.9	1.0328	0.0000	SURCHARGED
15 minute winter	205	10	134.608	0.258	84.8	0.3416	0.0000	OK
15 minute winter	206	10	134.305	0.155	183.9	0.2573	0.0000	OK
15 minute winter	207	10	132.668	0.268	254.2	0.6888	0.0000	OK
15 minute winter	208	10	132.402	0.277	259.0	0.4305	0.0000	OK
15 minute winter	209	11	132.139	0.289	332.7	0.7522	0.0000	OK
15 minute winter	210	10	131.631	0.181	127.2	0.5947	0.0000	OK
15 minute winter	211	11	130.997	0.322	468.8	0.6366	0.0000	OK
15 minute winter	212	11	130.228	0.328	484.9	0.6498	0.0000	OK
15 minute winter	213	10	130.173	0.172	44.9	0.3389	0.0000	OK
15 minute winter	214	11	129.856	0.406	543.3	0.8003	0.0000	OK
15 minute winter	215	10	134.687	0.112	59.9	0.2533	0.0000	OK
15 minute winter	216	10	133.989	0.139	74.6	0.1956	0.0000	OK
15 minute winter	217	10	132.726	0.201	74.9	0.4931	0.0000	OK
15 minute winter	218	10	132.573	0.223	162.2	0.3737	0.0000	OK
15 minute winter	219	10	133.252	0.127	48.7	0.2592	0.0000	OK
15 minute winter	220	10	132.366	0.266	434.4	1.3390	0.0000	OK
15 minute winter	221	11	129.447	0.622	1038.7	2.2139	0.0000	OK
15 minute winter	222	12	129.010	0.560	1108.4	1.9296	0.0000	OK
15 minute winter	223	10	128.970	0.120	74.9	0.2853	0.0000	OK
15 minute winter	224	13	128.487	0.162	112.0	0.3341	0.0000	OK
15 minute winter	225	13	128.496	1.371	1486.4	3.4011	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	34.022	202	1032.6	0.748	0.067	226.5232	
15 minute winter	202	34.023	225	960.8	2.694	1.717	2.2225	
15 minute winter	203	45.000	206	84.9	3.126	0.725	0.9872	
15 minute winter	204	46.000	205	73.6	1.851	1.738	0.2944	
15 minute winter	205	46.001	206	84.0	1.413	0.882	0.4025	
15 minute winter	206	45.001	207	183.1	2.507	0.262	2.7610	
15 minute winter	207	45.002	208	251.5	2.512	0.416	0.7950	
15 minute winter	208	45.003	209	257.8	2.460	0.448	0.9167	
15 minute winter	209	45.004	211	332.4	3.267	0.661	4.3320	
15 minute winter	210	47.000	211	126.5	3.222	0.486	0.3432	
15 minute winter	211	45.005	212	470.8	3.316	0.469	4.6958	
15 minute winter	212	45.006	214	486.4	2.453	0.354	4.1695	
15 minute winter	213	48.000	214	44.4	1.471	0.777	0.2494	
15 minute winter	214	45.007	221	548.7	2.131	0.567	13.7997	
15 minute winter	215	49.000	216	59.6	2.616	0.444	0.2506	
15 minute winter	216	49.001	218	73.8	2.990	0.636	0.6754	
15 minute winter	217	50.000	218	74.2	1.620	0.630	0.4080	
15 minute winter	218	49.002	220	161.8	2.690	0.343	0.1983	
15 minute winter	219	51.000	220	47.9	2.142	0.565	0.6778	
15 minute winter	220	49.003	221	433.5	4.322	0.637	7.2112	
15 minute winter	221	45.008	222	1037.9	2.929	0.859	14.5250	
15 minute winter	222	45.009	225	1072.8	3.296	0.667	25.8023	
15 minute winter	223	52.000	224	74.6	3.267	0.227	0.1189	
15 minute winter	224	52.001	225	111.8	3.367	0.210	0.6698	
15 minute winter	225	34.024	226	1496.5	2.442	0.849	19.1105	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	226	11	127.639	1.664	1505.1	4.9007	0.0000	SURCHARGED
30 minute winter	227	31	126.508	0.408	192.6	107.7201	0.0000	SURCHARGED
15 minute winter	228	10	127.206	1.856	1523.4	5.6789	0.0000	SURCHARGED
15 minute winter	229	10	126.765	1.965	1399.2	6.3371	0.0000	FLOOD RISK
30 minute winter	230	29	125.908	0.682	419.5	195.1456	0.0000	SURCHARGED
15 minute winter	231	10	126.361	1.736	1425.9	5.2985	0.0000	SURCHARGED
15 minute winter	232	10	126.005	1.580	1148.0	4.6474	0.0000	SURCHARGED
15 minute winter	233	10	125.547	1.371	1402.3	8.1327	0.0000	SURCHARGED
15 minute winter	234	10	124.756	1.056	1420.8	3.8845	0.0000	OK
1440 minute winter	235	1470	124.717	1.067	160.9	1.1850	0.0000	SURCHARGED
1440 minute winter	236	1470	124.717	1.167	158.3	5075.6680	0.0000	SURCHARGED
1440 minute winter	237	1470	124.716	1.241	9.9	2.7273	0.0000	SURCHARGED
15 minute winter	238	10	123.652	0.102	41.2	0.1931	0.0000	OK
15 minute winter	239	10	122.370	0.145	88.4	0.3168	0.0000	OK
15 minute winter	240	10	128.393	0.143	59.9	0.3205	0.0000	OK
15 minute winter	241	10	127.048	0.148	88.6	0.2863	0.0000	OK
15 minute winter	242	10	126.631	0.256	117.3	0.4859	0.0000	OK
15 minute winter	243	10	127.760	0.085	24.7	0.1363	0.0000	OK
15 minute winter	244	10	127.263	0.088	24.6	0.0999	0.0000	OK
15 minute winter	245	10	126.568	0.318	173.7	0.5971	0.0000	OK
15 minute winter	246	11	126.267	0.192	205.6	0.3575	0.0000	OK
15 minute winter	247	11	125.318	0.218	350.6	0.8382	0.0000	OK
15 minute winter	248	10	124.041	0.091	30.0	0.1566	0.0000	OK
15 minute winter	249	10	123.597	0.122	37.3	0.1560	0.0000	OK
15 minute winter	250	11	122.962	0.362	399.2	0.6046	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	226	34.025	228	1509.2	2.203	0.810	8.9109	
30 minute winter	227	53.000	228	-192.6	-3.148	-1.832	0.5894	
15 minute winter	228	34.026	229	1377.3	1.850	0.889	11.8129	
15 minute winter	229	34.027	231	1407.2	1.890	1.466	9.7998	
30 minute winter	230	54.000	231	-419.5	-3.150	-1.375	1.3324	
15 minute winter	231	34.028	232	1133.1	1.522	1.166	10.9292	
15 minute winter	232	34.029	233	1140.3	1.532	1.205	14.3971	
15 minute winter	233	34.030	234	1383.5	1.870	1.713	18.8635	
15 minute winter	234	34.031	235	1407.2	1.639	2.184	21.2622	
1440 minute winter	235	34.032	236	156.4	0.082	0.612	301.8396	
1440 minute winter	236	34.033	237	9.9	0.157	0.084	0.4729	
1440 minute winter	237	Depth/Flow	239	9.9				
15 minute winter	238	55.000	239	40.7	2.395	0.393	0.5092	
15 minute winter	239	34.035	252	88.0	2.561	0.217	0.2119	
15 minute winter	240	56.000	241	58.7	2.268	0.689	1.1668	
15 minute winter	241	56.001	242	88.2	1.978	0.298	0.9629	
15 minute winter	242	56.002	245	115.6	1.087	0.457	2.1613	
15 minute winter	243	57.000	244	24.6	2.338	0.517	0.0744	
15 minute winter	244	57.001	245	24.4	2.388	0.563	0.1088	
15 minute winter	245	56.003	246	173.9	1.880	0.884	4.3135	
15 minute winter	246	56.004	247	206.8	2.952	0.346	2.0143	
15 minute winter	247	56.005	250	349.4	3.287	0.487	5.4199	
15 minute winter	248	58.000	249	29.8	2.229	0.580	0.0765	
15 minute winter	249	58.001	250	37.0	2.598	0.826	0.1301	
15 minute winter	250	56.006	251	401.7	2.741	0.668	1.9061	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	251	11	122.572	0.422	433.4	0.8320	0.0000	OK
15 minute winter	252	11	121.768	0.243	526.4	0.6413	0.0000	OK
15 minute winter	253	11	120.643	0.268	551.2	0.7721	0.0000	OK
15 minute winter	254	11	119.261	0.286	588.8	0.8685	0.0000	OK
15 minute winter	255	1	124.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	256	1	124.325	0.000	0.0	0.0000	0.0000	OK
15 minute winter	257	11	123.803	0.028	15.0	0.0112	0.0000	OK
15 minute winter	258	11	122.291	0.041	28.9	0.0162	0.0000	OK
15 minute winter	259	12	121.342	0.042	28.5	0.0000	0.0000	OK
120 minute winter	260	102	120.012	0.187	9.5	0.0000	0.0000	OK
120 minute winter	261	100	120.012	0.412	5.4	0.0000	0.0000	SURCHARGED
15 minute winter	262	11	119.688	0.588	74.9	1.4844	0.0000	SURCHARGED
15 minute winter	263	11	119.493	0.443	71.8	0.5015	0.0000	SURCHARGED
15 minute winter	264	11	118.884	0.509	677.2	1.3773	0.0000	OK
15 minute winter	265	11	118.726	0.451	698.9	1.2638	0.0000	OK
15 minute winter	266	10	119.736	0.185	74.9	0.4570	0.0000	OK
15 minute winter	267	10	118.894	0.294	140.7	0.7419	0.0000	OK
15 minute winter	268	11	118.498	0.348	878.8	1.0659	0.0000	OK
15 minute winter	269	11	117.737	0.437	900.2	1.2409	0.0000	OK
15 minute winter	270	11	117.300	0.350	917.1	0.9769	0.0000	OK
15 minute winter	271	11	116.220	0.370	951.5	1.1251	0.0000	OK
15 minute winter	272	11	114.832	0.557	1054.1	2.7393	0.0000	OK
15 minute winter	273	10	115.632	0.157	59.9	0.3230	0.0000	OK
15 minute winter	274	10	115.209	0.184	83.4	0.3227	0.0000	OK
15 minute winter	275	11	114.700	0.575	1146.7	2.2167	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	251	56.007	252	434.4	3.230	0.769	1.0805	
15 minute winter	252	34.036	253	527.1	3.760	0.166	4.0235	
15 minute winter	253	34.037	254	553.6	3.529	0.214	8.3261	
15 minute winter	254	34.038	264	590.1	2.327	0.160	2.8437	
15 minute winter	255	59.000	256	0.0	0.000	0.000	0.0005	
15 minute winter	256	59.001	257	0.0	0.000	0.000	0.3535	
15 minute winter	257	59.002	258	14.3	0.379	0.001	1.6100	
15 minute winter	258	59.003	259	28.5	0.620	0.002	1.1007	
15 minute winter	259	59.004	260	27.5	0.507	0.002	3.7093	
120 minute winter	260	59.005	261	5.4	0.113	0.001	13.0248	
120 minute winter	261	Depth/Flow	264	2.1				
15 minute winter	262	60.000	263	71.8	1.807	1.463	0.2224	
15 minute winter	263	60.001	264	72.2	1.815	1.712	0.4453	
15 minute winter	264	34.039	265	677.8	2.108	0.513	4.6335	
15 minute winter	265	34.040	268	698.9	2.753	0.395	2.5721	
15 minute winter	266	61.000	267	73.3	2.200	0.920	1.0368	
15 minute winter	267	61.001	268	138.6	1.359	0.659	1.7992	
15 minute winter	268	34.041	269	879.1	3.518	0.285	5.6691	
15 minute winter	269	34.042	270	899.5	3.588	0.348	3.3271	
15 minute winter	270	34.043	271	916.2	4.099	0.306	6.9482	
15 minute winter	271	34.044	272	948.3	4.532	0.328	7.1365	
15 minute winter	272	34.045	275	1052.6	1.940	0.213	8.2171	
15 minute winter	273	62.000	274	59.5	2.252	0.619	0.1749	
15 minute winter	274	62.001	275	82.9	1.502	0.273	0.4705	
15 minute winter	275	34.046	276	1142.1	1.994	0.292	20.7391	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	276	11	114.506	0.606	1205.5	2.6261	0.0000	OK
15 minute winter	277	10	116.334	0.084	37.4	0.1500	0.0000	OK
15 minute winter	278	10	115.907	0.082	44.7	0.1017	0.0000	OK
15 minute winter	279	11	114.346	0.571	1250.7	2.1927	0.0000	OK
15 minute winter	280	11	114.169	0.643	2186.1	2.5970	0.0000	OK
15 minute winter	281	12	113.566	0.491	2214.4	1.9441	0.0000	OK
15 minute winter	282	10	115.282	0.107	37.4	0.1967	0.0000	OK
15 minute winter	283	10	114.922	0.097	44.7	0.1230	0.0000	OK
15 minute winter	284	10	114.054	0.154	59.4	0.2120	0.0000	OK
15 minute winter	285	10	113.943	0.242	86.7	0.3792	0.0000	OK
15 minute winter	286	11	113.712	0.187	100.5	0.2588	0.0000	OK
15 minute winter	287	12	112.720	0.870	2349.1	3.5422	0.0000	OK
15 minute winter	288	12	112.492	0.892	2411.3	3.8547	0.0000	OK
15 minute winter	289	12	112.255	0.780	2415.5	2.7013	0.0000	OK
15 minute winter	290	10	114.109	0.158	95.1	0.4320	0.0000	OK
15 minute winter	291	10	113.127	0.177	150.0	0.4126	0.0000	OK
15 minute winter	292	12	111.795	0.745	2565.3	3.5630	0.0000	OK
15 minute winter	293	10	112.271	0.171	52.4	0.3589	0.0000	OK
15 minute winter	294	10	112.169	0.194	59.4	0.2460	0.0000	OK
15 minute winter	295	12	111.524	0.924	2629.3	4.2957	0.0000	OK
15 minute winter	296	12	111.418	0.842	2628.7	0.0000	0.0000	OK
15 minute winter	297	10	111.695	0.095	33.7	0.1562	0.0000	OK
15 minute winter	298	10	111.382	0.056	33.5	0.0639	0.0000	OK
15 minute winter	299	14	111.288	0.838	2634.4	0.0000	0.0000	OK
15 minute winter	300	10	125.037	0.062	18.7	0.0915	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	276	34.047	279	1194.1	2.103	0.305	11.4545	
15 minute winter	277	63.000	278	37.3	2.349	0.140	0.1189	
15 minute winter	278	63.001	279	44.5	2.972	0.146	0.2165	
15 minute winter	279	34.048	280	1253.2	2.109	0.228	12.1399	
15 minute winter	280	1.037	281	2193.9	4.023	0.373	17.4788	
15 minute winter	281	1.038	287	2228.6	3.225	0.239	23.9615	
15 minute winter	282	64.000	283	37.2	2.126	0.381	0.1753	
15 minute winter	283	64.001	284	44.4	2.880	0.330	0.1985	
15 minute winter	284	64.002	285	59.1	1.195	0.400	0.5550	
15 minute winter	285	64.003	286	85.5	1.590	0.934	1.3709	
15 minute winter	286	64.004	287	100.5	2.263	0.654	1.6325	
15 minute winter	287	1.039	288	2362.1	2.518	0.469	22.7459	
15 minute winter	288	1.040	289	2415.5	2.882	0.525	8.8610	
15 minute winter	289	1.041	292	2417.1	3.808	0.449	4.8995	
15 minute winter	290	65.000	291	93.8	2.597	0.495	1.1573	
15 minute winter	291	65.001	292	148.9	3.135	0.378	0.9566	
15 minute winter	292	1.042	295	2568.7	2.552	0.248	24.2564	
15 minute winter	293	66.000	294	51.9	1.506	0.538	0.1256	
15 minute winter	294	66.001	295	59.0	1.800	0.809	0.1659	
15 minute winter	295	1.043	296	2628.7	2.437	0.772	13.2656	
15 minute winter	296	1.044	299	2607.4	1.032	0.290	182.2587	
15 minute winter	297	67.000	298	33.5	2.407	0.157	0.1061	
15 minute winter	298	67.001	299	33.5	3.148	0.079	0.2399	
15 minute winter	299	1.045	325	2273.5	0.907	0.122	109.1660	
15 minute winter	300	68.000	301	18.6	1.338	0.167	0.2621	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	124.235	0.110	48.6	0.1853	0.0000	OK
15 minute winter	302	10	123.608	0.108	48.2	0.1224	0.0000	OK
15 minute winter	303	10	122.770	0.170	104.0	0.4038	0.0000	OK
15 minute winter	304	11	122.533	0.333	163.2	0.7983	0.0000	OK
15 minute winter	305	11	122.394	0.394	225.2	0.9224	0.0000	OK
15 minute winter	306	10	128.595	0.145	44.9	0.2851	0.0000	OK
15 minute winter	307	10	128.227	0.127	53.4	0.1650	0.0000	OK
15 minute winter	308	12	127.706	0.206	64.6	0.2761	0.0000	OK
15 minute winter	309	11	127.485	0.535	22.5	0.8274	0.0000	SURCHARGED
15 minute winter	310	11	127.446	0.621	89.6	0.8249	0.0000	SURCHARGED
15 minute winter	311	10	126.956	0.081	30.0	0.1349	0.0000	OK
15 minute winter	312	10	126.708	0.108	49.3	0.1589	0.0000	OK
15 minute winter	313	11	126.331	0.156	156.8	0.2382	0.0000	OK
15 minute winter	314	10	124.249	0.124	37.4	0.2324	0.0000	OK
15 minute winter	315	10	123.588	0.113	59.5	0.1778	0.0000	OK
15 minute winter	316	11	122.075	0.275	482.2	0.5144	0.0000	OK
15 minute winter	317	11	120.311	0.361	483.0	0.5167	0.0000	OK
15 minute winter	318	11	119.856	0.206	483.1	0.0000	0.0000	OK
15 minute winter	319	12	119.705	0.230	483.1	0.0000	0.0000	OK
15 minute winter	320	12	119.710	0.760	482.7	0.0000	0.0000	OK
15 minute winter	321	12	118.075	0.175	455.6	0.0000	0.0000	OK
15 minute winter	322	13	117.296	0.746	455.6	0.0000	0.0000	OK
15 minute winter	323	13	115.490	0.715	429.1	0.0000	0.0000	OK
15 minute winter	324	13	113.514	0.739	428.8	0.0000	0.0000	OK
15 minute winter	325	14	111.277	1.077	2701.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	68.001	302	48.2	2.533	0.413	0.2388	
15 minute winter	302	68.002	303	47.8	2.680	0.404	0.2612	
15 minute winter	303	68.003	304	103.3	1.783	0.333	0.8758	
15 minute winter	304	68.004	305	159.7	1.169	0.797	7.0495	
15 minute winter	305	68.005	316	226.0	1.811	1.119	6.3231	
15 minute winter	306	69.000	307	44.4	1.788	0.663	0.5303	
15 minute winter	307	69.001	308	53.4	2.160	0.572	0.5537	
15 minute winter	308	69.002	310	61.1	1.733	0.613	0.7237	
15 minute winter	309	70.000	310	19.8	0.655	0.472	0.7608	
15 minute winter	310	69.003	313	88.7	2.231	1.216	1.1553	
15 minute winter	311	71.000	312	29.9	1.577	0.140	0.1425	
15 minute winter	312	71.001	313	49.1	1.681	0.257	0.4244	
15 minute winter	313	69.004	316	157.0	4.365	0.503	1.9496	
15 minute winter	314	72.000	315	37.0	2.481	0.871	0.1717	
15 minute winter	315	72.001	316	59.2	4.607	0.702	0.0796	
15 minute winter	316	68.006	317	483.0	4.030	0.640	4.0707	
15 minute winter	317	68.007	318	483.1	4.593	0.881	1.0840	
15 minute winter	318	68.008	319	483.1	1.448	0.034	1.8524	
15 minute winter	319	68.009	320	482.7	0.670	0.034	22.4488	
15 minute winter	320	Head/Flow	321	455.6				
15 minute winter	321	68.011	322	455.6	0.757	0.025	32.4617	
15 minute winter	322	Head/Flow	323	429.1				
15 minute winter	323	Head/Flow	324	428.8				
15 minute winter	324	Head/Flow	325	428.5				
15 minute winter	325	1.046	326	2568.8	1.218	0.900	66.3185	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	15	111.124	1.124	2568.8	10.5097	0.0000	OK
15 minute winter	327	15	110.813	1.237	2512.6	11.5681	0.0000	OK
15 minute winter	328	16	110.202	0.802	2505.2	0.0000	0.0000	SURCHARGED
15 minute winter	329	17	110.009	0.784	2475.6	0.0000	0.0000	SURCHARGED
15 minute winter	330	17	109.871	0.771	2376.7	0.0000	0.0000	SURCHARGED
1440 minute winter	331	1680	109.861	0.911	161.0	0.0000	0.0000	SURCHARGED
1440 minute winter	332	1680	109.861	1.011	155.4	4959.7670	0.0000	SURCHARGED
1440 minute winter	333	1680	109.859	1.059	10.1	1.1975	0.0000	SURCHARGED
15 minute winter	334	1	107.370	0.000	4.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	1.047	327	2512.6	1.062	0.966	144.2322	
15 minute winter	327	1.048	328	2505.2	2.185	1.507	28.0169	
15 minute winter	328	1.049	329	2475.6	0.941	7.985	245.1666	
15 minute winter	329	1.050	330	2376.7	0.977	7.540	165.0337	
15 minute winter	330	1.051	331	2345.6	0.971	7.553	184.7947	
1440 minute winter	331	1.052	332	155.4	0.093	0.485	181.8322	
1440 minute winter	332	1.053	333	10.1	0.143	0.181	1.3715	
1440 minute winter	333	Depth/Flow	334	10.1				697.0

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Appendix M

Surface Water Drainage Statement: Pro-Forma

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed development this pro-forma must be completed in full and be submitted with any planning application which seeks permission for 'major' development. This information contained in this form will be used by Hertfordshire County Council in its role as Lead Local Flood Authority and 'statutory consultee' on SuDs for all 'major' planning applications. The pro-forma is supported by the Defra/EA Guidance on Rainfall Runoff Management. The pro-forma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

1. Site Details

Site	Land north east of Great Ashby
Address & post code or LPA reference	
Grid reference	526593,227860
Is the existing site developed or Greenfield?	greenfield
Total Site Area served by drainage system (excluding open space) (Ha)*	27.291
Topographical survey plan showing existing site layout, site levels and drainage system	Yes - See FRA Appendix B

***** The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers & Local Authorities
Impermeable area (ha) (catchment areas to be shown on a plan)			16.5ha (proposed)	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed permeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)		watercourse	N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
Existing and proposed calculations	✔		See FRA Appendix K	Please provide Hydraulic modelling calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration	✔		of permeable paving can be utilised n some areas. For Ground Investigation report - Se	e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse	✔		surface water flows from site to discharge to existing ditch to the south of the site.	e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA).
To surface water sewer		✔		Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above	✔		as described above.	e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.
Has the drainage proposal had regard to the SuDS hierarchy?	✔		See FRA section 4	Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Layout plan showing where the sustainable drainage infrastructure will be located on site.	✔		See FRA Appendix J	Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of development.

Technical Standards S2 and S3

4. Peak Discharge Rates – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
Greenfield QBAR	26	N/A	N/A	Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1	23	26		Proposed discharge rates (with mitigation) should be as close as reasonably practicable to predevelopment greenfield run-off rates with long term storage or Qbar, they must be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events. If discharging to watercourse post development results need to be with and without a surcharged outfall. The critical results need to be provided for both the critical storm by level and critical storm by outflow.
1 in 30	64.9	26		
1in 100	94.3	26		
1 in 100 plus climate change	N/A	26		To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change should be added to the peak rainfall intensity. EA Guidance - Flood Risk Assessments: Climate Change Allowances https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Technical Standards S4 to S9

5. Calculate discharge volumes –The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Volume (m^3)	Proposed Volume (m^3)	Difference (m^3) (Proposed-Existing)	Notes for developers & Local Authorities
1 in 1				Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30				
1in 100				
1 in 100 plus climate change				To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

		Notes for developers & Local Authorities
Storage volume required to retain discharge rates as existing (m^3)	27000	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing
Where will the storage be provided on site?	attenuation basin	

7. How is Storm Water stored on site?

Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

			Notes for developers & Local Authorities
Infiltration	**State the Site's Geology/drift material overlaying)**	refer to FRA para. 3.20	Avoid infiltrating in made ground.
	Does the site have a high ground water table? Yes/No?	No	If yes, please provide details of the site's hydrology.
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?	Yes- Zone III - Total Catchment	Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ)
	Are infiltration rates suitable?	suitable for partial infiltration in some areas via permeable paving.	Infiltration rates should be no lower than 1x10 $^{-6}$ m/s.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	No	Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
	State the distance between a proposed infiltration device base and the ground water (GW) level	groundwater was not encountered during the onsite ground investigations	Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
	Were infiltration rates obtained by desk study or infiltration test?	infiltration test	Infiltration rates can be estimated from desk studies for outline planning permission if a back-up attenuation scheme is provided. Site specific BRE 365 tests should be provided for Full planning Permission
Is infiltration feasible?	**Yes/No?**	he results of infiltration testing carried out by GRE confirmed that the soakage rates recorded on the site were generally poor and insufficient to support a fully infiltration-based strategy. 4.5 It is however considered that infiltration by way of permeable paving can be utilised in some areas of the site.	If infiltration is not feasible how will the additional volume be stored?. The applicant should then consider the following options in the next section.

7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

		Notes for developers & Local Authorities
Please confirm what option has been chosen and how much storage is required on site.	Option 1 simple	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Additional Consideration to comply with the Technical Standards and PPG

		Notes for developers & Local Authorities
Which Drainage Systems measures have been used?	attenuation basins, permeable paving and swales	SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	See Flood Routing Plan provided in FRA Appendix F	**Safely:** not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths.
How are rates being restricted?	Flow control	Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices not be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
Drainage during construction period	TBC	Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control.
Key Drainage components / Features		Which component if blocked (even partial) will lead to flooding?

Technical Standards S10 to S12

9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

How is the entire drainage system to be maintained in perpetuity?	Refer to FRA para. 4.34 - 4.40.	Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust. Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed. — Specification notes that describe how work is to be undertaken and the materials to be used. — A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate. — A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the Management Plan. Where open water is involved please provide a health and safety plan within the management plan.
Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.	See FRA para. 4.34-4.40	If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.
Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.	N/A	

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By Yolanda Tafirenyika

Qualification of person responsible for signing off this pro-forma Senior Engineer

Company……,.....

On behalf of (Client's details) Picture Estates Ltd

Date: 03/04/2025

Appendix N

Thames Water Pre-Planning Assessment Report

Woods Hardwick

Architecture | Engineering | Planning | Surveying

Sandra Pang

Woods Harwick
15-17 Goldington Road
Bedford
MK40 3NH

Wastewater pre-planning
Our ref DS6149451/DTS16430

20 October 2025

Pre-planning enquiry: Capacity concerns (foul water)

Site Address: Mendip Way, Stevenage, Hertfordshire, SG1 6DR

Dear Sandra,

Thank you for providing information on your proposed development of 650 houses, a primary school for 420 students, and a secondary school for 720 students. Foul water to discharge via gravity into manhole TL2627**5302** on a 375mm foul sewer.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

We've assessed your foul water proposals and concluded that our sewerage network will have enough capacity for you to connect **20 houses**, but will be unable to meet the needs of your full development at this time.

In order to ensure we make the appropriate upgrades – or 'off-site reinforcement' – to serve the remainder of your development, we'll need to carry out modelling work, design a solution and build the necessary improvements. This work is done at our cost.

Once we've begun modelling, we may need to contact you to discuss changing the connection point for capacity reasons. Please note that we'll pay the cost of covering any extra distance if the connection needs to be made at a point further away than the nearest practicable point of at least the same diameter.

How long could modelling and reinforcement take?

Typical timescales for a development of your size are:

Modelling: 9-12 months
Design: 6 months
Construction: Up to 18 months*
Total: Up to 36 months

*(dependent on Traffic Management, Local Authority and 3rd Party Landowners)

If the time you're likely to take from planning and construction through to first occupancy is longer than this, we'll be able to carry out the necessary upgrades in time for your development.

If it's shorter, we may seek planning conditions, please contact me on the number below to discuss the timing of our activities.

What do you need to tell us before we start modelling?

We will only carry out modelling once we're confident that your development will proceed. In order to have this confidence, we'll need you to provide: **1) land registry; 2) either outline or full planning permission; 3) construction programme**. Please email this information to us as soon as you have it.

If the modelling shows we need to carry out reinforcement work, then before we start construction, we'll need you to supply us with notification that you've confirmed your F10 – Notification of construction project - submission to the Health and Safety Executive.

Surface Water

Surface water capacity was not assessed in this application.

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2) rainwater infiltration to ground at or close to source
3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4) rainwater discharge direct to a watercourse (unless not appropriate)
5) controlled rainwater discharge to a surface water sewer or drain
6) controlled rainwater discharge to a combined sewer.

Where connection to the public sewerage network is required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

Where disposal of surface water is other than to a public sewer, then the applicant shall ensure that approval for the discharge has been obtained from the appropriate authorities.

Capacity at STW?

The receiving network is served by Rye Meads STW. For more information about STW upgrades, please visit Investment plans for storm discharge sites | Thames Water.

What do you need to do next?

If you've satisfied the points above, then you should compare your own timeline with the typical timescales we've suggested for our activities. If the time you're likely to take from planning and

construction through to first occupancy is **more** than the total time we're likely to take, we'll be able to carry out the necessary upgrades in time for your development.

Please see our FAQ's leaflet for additional information.

If you have any further questions, please contact us.

Yours sincerely,

Jiahang Yu
Adoptions & Pre-Planning Engineer
Developer Services

Woods Hardwick

Architecture | Engineering | Planning | Surveying

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