

**Land at Junction 22 of the M1,
Cliffe Hill Farm**

Flood Risk Assessment and Drainage Strategy

for

The logo for Caddick Developments, with 'Caddick' in black and 'Developments.' in orange.

Ref: 30206-BGL-XX-XX-RP-D-00001

Version 11
June 2026

DOCUMENT CONTROL SHEET

Issued by: Burrows Graham Limited
5 Ambassador Place
Stockport Road
Altrincham
WA15 8DB

Tel: +44 (0)161 804 8046

Client: Caddick Developments Limited

Project: Land at Junction 22 of the M1, Cliffe Hill Farm

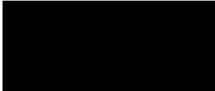
Document No: 30206-BGL-XX-XX-RP-D-00001

Title: Flood Risk Assessment and Drainage Strategy

Status: Planning

Date: 17.06.2026

Document Production Record

Version Number:	P11	Name	Signature
Prepared		Benny Prescott – Senior Civil Engineering Technician	
Checked		Jack Williams CEng MICE MCiHT – Civils Director	
Approved		Jack Williams CEng MICE MCiHT – Civils Director	

Document Revision Record

Version Number	Date	Revision Details
P01	06.01.2025	Draft Issue
P02	18.07.2025	Update to suit latest masterplan
P03	05.09.2025	Update to suit comments
P04	16.09.2025	Planning Issue
P05	23.09.2025	Planning Issue
P06	19.11.2025	BREEAM Update. Update to eastern mound drainage
P07	20.05.2026	Update to drainage strategy following LLFA feedback
P08	29.05.2026	Update to suit comments
P09	02.06.2026	Update to suit comments
P10	11.06.2026	Appendices updated
P11	17.06.2026	Appendices updated

Burrows Graham Limited has prepared this report in accordance with the instructions of the above-named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

- 1.0 EXECUTIVE SUMMARY**
- 2.0 PROJECT BACKGROUND**
- 3.0 SITE DETAILS**
- 4.0 FLOOD RISK STATEMENT**
- 5.0 SURFACE WATER DRAINAGE STRATEGY**
- 6.0 FOUL WATER DRAINAGE STRATEGY**
- 7.0 MITIGATION / MANAGEMENT OF FLOOD RISK**
- 8.0 CONCLUSION**
- 9.0 BREEAM POL 03 COMPLIANCE**
- 10.0 BS 8533:2017 HIERARCHY APPROACH**

APPENDICES

- APPENDIX A – SITE LAYOUT**
- APPENDIX B – TOPOGRAPHICAL SURVEY**
- APPENDIX C – EXISTING CATCHMENT AND PROPOSED DISCHARGE RATE PLANS**
- APPENDIX D – PROPOSED DRAINAGE STRATEGY**
- APPENDIX E – HYDRAULIC CALCULATIONS**
- APPENDIX F – EXCEEDANCE PLAN**
- APPENDIX G – DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE**
- APPENDIX H – EXISTING SEWER PLANS**
- APPENDIX I – SEVERN TRENT WATER CORRESPONDENCE**

FIGURES

- FIGURE 1 – SITE LAYOUT**
- FIGURE 2 – SITE LOCATION PLAN**
- FIGURE 3 – FLOOD MAPS FOR PLANNING EXTRACT**
- FIGURE 4 – FLOOD MAPS FOR SURFACE WATER FLOODING EXTRACT**
- FIGURE 5 – LEICESTERSHIRE COUNTY COUNCIL SFRA EXTRACT**
- FIGURE 6 – GROUNDSURE GROUNDWATER FLOODING MAP**

TABLES

- TABLE 1 – SITE CHARACTERISTICS**
- TABLE 2 – TOTAL AREA**
- TABLE 3 – HYDROLOGICAL CHARACTERISTICS FOR THE SITE**
- TABLE 4 – EASTERN CATCHMENT GREENFIELD RUNOFF RATES**
- TABLE 5 – WESTERN CATCHMENT GREENFIELD RUNOFF RATES**
- TABLE 6 – PROPOSED BETTERMENT TO GREENFIELD RUNOFF RATES**
- TABLE 7 – PROPOSED BETTERMENT TO GREENFIELD RUNOFF RATES**

1.0 – EXECUTIVE SUMMARY

This report has been prepared to support the full planning application for the following proposal;

Full Planning Application for the redevelopment of the site at Cliffe Hill Farm at J22 of the M1 for storage and distribution uses (Class B8), general industry (Class B2), ancillary office space (Class E(g)(i)), together with associated development including access, landscaping, earthworks, ancillary infrastructure, and parking.

Reference should be made to the Geo 2 'Preliminary Risk Assessment' for further detail on the geo-environmental and ground conditions. Document Number: 25/4467A.2

The flood risk assessment identifies that the site is located in flood zone 1 (low risk) in respect to fluvial flood risk, while there are some localised areas on site with a medium/high risk of surface water flooding, this will be mitigated through the development's levels and drainage designs.

The surface water drainage hierarchy has been considered and the preferred drainage solution for disposal of surface water is to discharge to a watercourse. A number of watercourses serve the site, these proposals aim to closely replicate the existing drainage scenario by using two of the existing watercourses, splitting discharge across both in line with current catchments. A betterment to incoming flows shall be achieved to each watercourse through on site attenuation and flow control.

The use of Sustainable Drainage Systems (SuDS) has been considered. Pollution prevention and site control methods will be utilised prior to outfall.

The SuDS and other drainage elements will be regularly maintained by an appointed management company on behalf of the client/occupier.

It is proposed foul flows will be pumped to an existing public foul sewer located outside of the site to the south within Ashby Road. A predevelopment enquiry has been made to Severn Trent Water regarding this connection point.

2.0 - PROJECT BACKGROUND

2.1 - Appointment

Burrows Graham Limited have been commissioned by Caddick Developments Limited (referred to as 'the applicant' hereafter) to undertake a flood risk assessment and drainage strategy of suitable scope to support a planning application for a proposed commercial development on Land at Junction 22 of the M1, Cliffe Hill Farm, LE67 9PH.

2.2 - Aim of study

This FRA and Drainage Strategy has been developed in due cognisance of all relevant available policy information. This report shall satisfy the requirements of the National Planning Policy Framework (NPPF) and all relevant flood risk planning policies.

2.3 - Relevant policy and strategy documents

The following documents were reviewed as part of this Flood Risk Assessment:

- Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)
- Environment Agency Climate Change Guidance (February 2016)
- Flood and Water Management Act (April 2010)
- National Planning Policy Framework (Updated February 2025) and Planning Practice Guidance (March 2014)
- Sustainable Drainage Systems Written Statement HCWS161 (December 2014)
- Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment (SFRA) 2025
- Hinckley and Bosworth Borough Council Local Plan 2006-2026

2.4 - Proposed development

The Proposed Development will comprise warehouse units for up to 697,440 sq. ft of floorspace for storage and distribution uses (Class B8), general industry (Class B2), ancillary office space (Class E(g)(i)),

The current greenfield site measures c. 28.24 hectares and is wholly located within the Hinckley and Bosworth Borough Council administrative district. The site is immediately to the east of the M1, northeast of junction 22 and to the north of the A50.

Reference should be made to the 'Site Layout' included in Appendix A, an extract of which is shown below.



Figure 1 – Site Layout

3.0 - SITE DETAILS

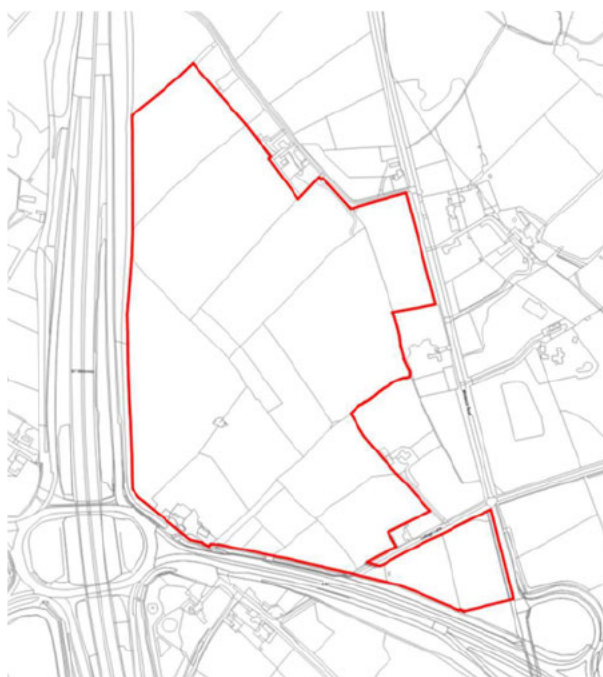


Figure 2 – Site Location Plan

3.1- Site description

Site address	Land at Junction 22 of the M1, Cliffe Hill Farm, LE67 9PH.
Grid reference	E = 448063 N=311273
Area (hectares)	The site boundary has been measured to be 28.24 hectares.
Usage	The site currently comprises agricultural land with agricultural buildings, stables, and a bungalow (associated with Cliffe Hill Farm) and an equestrian menage.
Surroundings	North – White Hill Farm B&B and associated land delineates the northern boundary of the site, beyond this land is Old House Lane. East – White Hill, Forest Edge, Weavers Cottage and associated parcels of land delineates the eastern boundary of the site, beyond this land is Whitwick Road. Whitwick road directly delineates the boundary in some areas of the eastern boundary. South – The A50 delineates the southern boundary of the site. West - The M1 delineates the western boundary of the site.
Topography	Site levels generally fall from the north to the south with large level differences of 29m across the site. Levels are highest at northeastern boundary with levels circa 220m AOD. The lowest lying area of the site is the southeastern most point of the site with levels around 191m AOD. A copy of the topographical survey has been included in Appendix B of this report.

Table 1 - Site characteristics

3.2 - Existing drainage

There is an existing culvert in the centre of the site which flows from east to west, routing flows from the existing northern ditches into the M1 highway ditch. For further detail, reference should be made to the existing catchment drainage plan (30206-BGL-XX-XX-DR-C-00255) included in Appendix C of this document.

3.3 - Existing watercourses.

The site has a series of existing ditches which collect the surface water runoff from the site and convey flows towards ordinary watercourses to the east and west of the site. Approximately 40% of the site currently discharges to the east into a ditch within the site boundary which then discharges under Whitwick Road via a 900mm diameter culvert and 60% of the site currently discharges to the west, through onsite ditches which ultimately discharge into a ditch adjacent to the M1 through a 300mm culvert or towards highway sewers located within the A50 to the southwest of the site where existing piped connections are made from onsite ditches. There are no Main Rivers within the vicinity of the site. For further detail, reference should be made to the existing and proposed discharge rates plan (30206-BGL-XX-XX-DR-C-00251) included in Appendix C of this document.

3.4 - Geology and hydrogeology

Reference should be made to the Geo 2 Preliminary Risk Assessment. Document Number: 25/4467A.2, the key findings of which have been summarised below.

Information published by the British Geological Survey (BGS) indicates that the majority of the site is underlain by natural Superficial deposits of Head and Oadby Till (Glacial Till). Superficial soils are indicated to be locally absent in the centre of the site.

Bedrock geology at the site is complex, indicated to comprise relatively flat lying strata of the Gunthorpe Member (clays and mudstones) overlying the strata of the Beacon Hill and Bradgate Formation; the latter are shown to be steeply inclined to the southwest and outcrop in the central area. The Beacon Hill and Bradgate Formation strata comprise volcanoclastic siltstones (i.e. siltstones composed of volcanic ash).

The Environment Agency (EA) classifies the Superficial deposits of Head and Oadby till as a Secondary Undifferentiated Aquifers. The bedrock geologies are classified as Secondary B Aquifers.

The site is not located in a groundwater Source Protection Zone (SPZ) and there are no sensitive groundwater abstractions in the vicinity of the site. The closest protection zone is circa 1.5 km to the west of the site.

There is low risk for groundwater flooding to occur on the site.

4.0 – FLOOD RISK STATEMENT

4.1 – Fluvial flood risk

The National Planning Policy Framework (NPPF) categorises flood risk as follows:

- Zone 1 (low probability) – Land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 (medium probability) – Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year; and
- Zone 3a (high probability) – Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Zone 3b The Functional Floodplain – This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the EA. (Not separately distinguished from Zone 3a on the Flood Map).

The EA flood maps for planning show that the site is wholly located within flood zone 1, as stated above, the site is considered to be at low risk of flooding from rivers or sea.

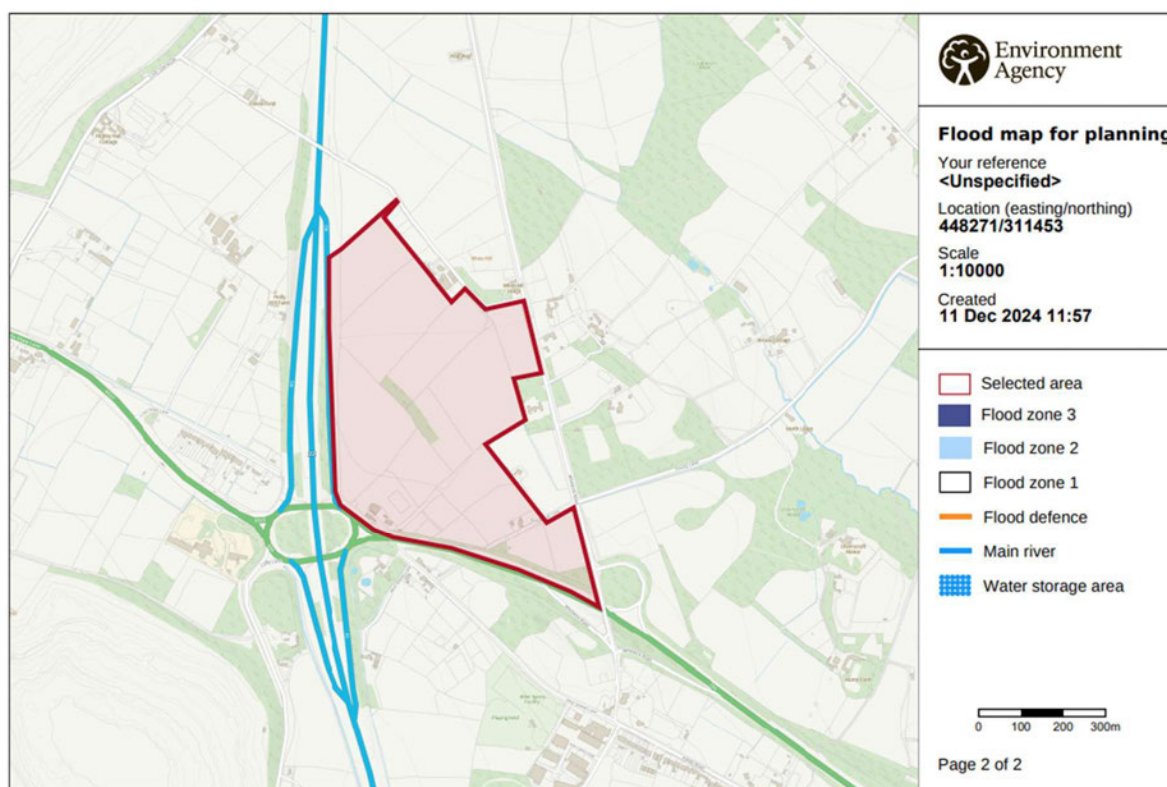
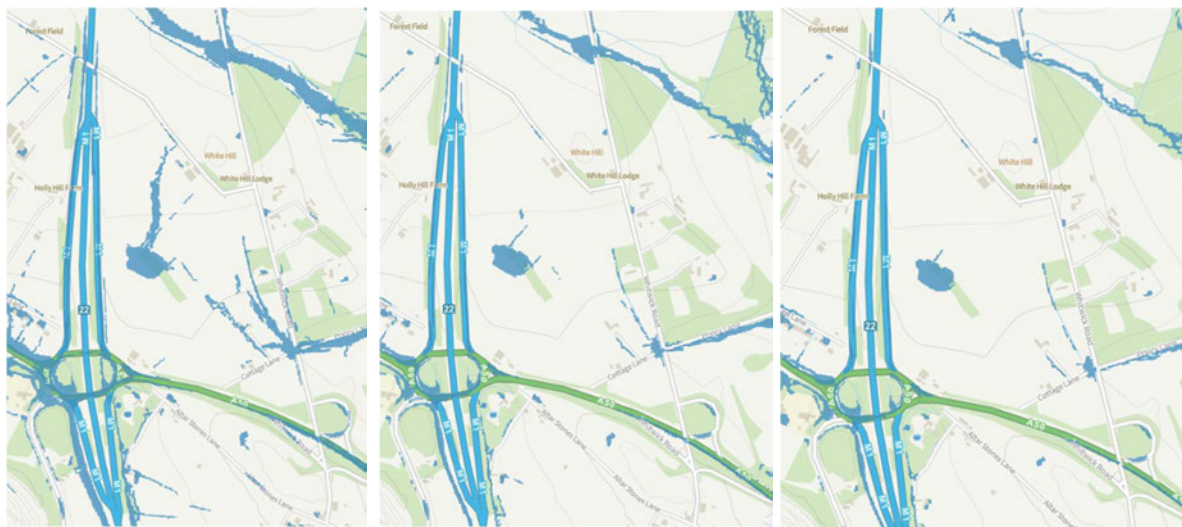


Figure 3 – EA Flood Map for Planning

4.2 - Surface water flooding

The EA descriptions for the High, Medium and Low risk scenarios for surface water flooding are as follows:

- High risk means that each year this area has a chance of flooding of greater than 3.3%.
- Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Very Low risk means that each year this area has a chance of flooding of less than 0.1%.



Low Risk

Medium Risk

High Risk

Figure 4 – EA Flood Map for Surface Water

The EA Map of long-term flood risk from surface water indicates that the site is predominantly very low risk from surface water flooding however, the maps shows some localised areas of low to high-risk surface water flooding on the site.

The proposed drainage strategy detailed in section 5.0 of this report shall provide details on how the surface water will be managed to ensure the site is low risk of surface water flooding.

The area of low to high-risk surface water flooding shown in the centre of the site, is located along the routes of the existing ditches which run west towards the M1. These areas are to be redeveloped, the corresponding catchment shall be collected and attenuated by the sites surface water drainage system.

The area of low to high-risk surface water flooding shown to the east of the site is located along the route of the ditch which runs along the eastern boundary with most of the flooding predominantly offsite.

Through the implementation of the proposed drainage strategy, the incoming discharge rates that the eastern ditch shall receive post-development will be substantially better than the existing scenario. The reduced and controlled discharge rates from the proposed development will provide betterment to the surface water flooding in this area therefore, it is determined that surface water flooding should not pose a risk to the site.

4.3 - Groundwater flood risk

The areas susceptible to groundwater flooding map, taken from the Leicestershire County Council Preliminary Flood Risk Assessment, shows most of the site to be in an area with <25% chance of groundwater emergence. A small part of the site along the southern boundary may fall within an area with >25%, <50% chance of groundwater emergence. Overall, this map highlights that the development is sited in an area of Leicestershire which is less susceptible to groundwater flooding.

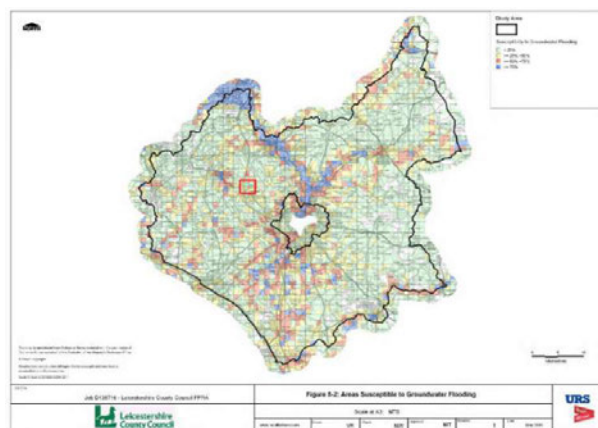


Figure 5 – Leicestershire County Council SFRA– Areas Susceptible to Groundwater Flooding Extract



Figure 6 – Groundsure Groundwater Flooding Map

For further detailed mapping, reference should be made to the Geo 2 'Preliminary Risk Assessment' Document Number: 25/4467A.2 which includes a site-specific groundwater flooding map. This mapping highlights that the site has predominantly negligible risk of groundwater flooding with areas to the south of the site highlighted as low risk.

Based on the information available, it is considered that groundwater flooding does not pose a risk to the proposed development.

4.4 - Sewer flooding

There are no existing public sewers within the vicinity of the site. Therefore, the site is at low of risk of flooding from sewers.

4.5 - Tidal flooding

The site is remote from tidal influences and is therefore not at risk of tidal or coastal flooding.

4.6 - Reservoir flooding

Based on the EA Flood Risk from Reservoirs Map, the site is not at risk of flooding from reservoirs.

4.7 – Artificial Flooding

The site is at low risk of flooding from artificial sources and canals.

5.0– SURFACE WATER DRAINAGE STRATEGY

5.1 – Disposal of surface water

The method for removal of surface water from the site has been selected in accordance with the hierarchy outlined in Building Regulations Part H as summarised below:

- Infiltration to the ground
- Discharge to a watercourse
- Connection to a surface water sewer
- Connection to a combined sewer

As detailed in the Geo 2 'Preliminary Risk Assessment', Infiltration testing was undertaken which showed the site to be unsuitable for soakaway drainage, as such this has been discounted.

Therefore, it is proposed to discharge surface water runoff to the existing watercourses to the east and south west of this site which is mentioned in section 3.3 of this report.

The eastern portion of the site shall be collected, attenuated and discharged into an existing ditch towards the southeast this of the site, flows are then directed through an existing culvert under Whitwick Road connecting into a downstream watercourse.

The western portion of the site shall be collected, attenuated and discharged into an existing drainage ditch within the site boundary towards the southwest of the site; the ditch currently discharges into a highway drain via a pipe which connections into a highway sewer located in the footway of the A50. Flows are then directed through a culvert under the A50 connecting into a downstream watercourse which flows south.

The relevant site area post-development discharging into each catchment has been matched to the current scenario with no cross catchment flows proposed.

A betterment to incoming flows shall be achieved to each watercourse through on site attenuation and flow control, for further details regarding the proposed betterments, refer to section 5.6 of this document.

5.2 – Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS) will be utilised in line with The SuDS Manual (C753) guidance and aim to minimise the impact a development has on the runoff quantity and quality and maximise amenity and biodiversity opportunities.

The management train approach is a fundamental principle of SuDS, it aims to primarily reduce pollution, flow rates and volume of runoff from the site. The main objective is to treat the runoff as close to the source as possible and it is imperative that at least two of the following should be included within the drainage strategy.

- **Prevention** – The use of good site design and rainwater re-use measures to prevent runoff.
- **Source Control** – Controlling the runoff as close to source as possible by using; green roofs, porous pavements and soakaways.
- **Site Control** – Use of water management techniques within local area, i.e. detention basins and geo-cellular storage.
- **Regional Control** – Management of water from a number of sites in a specific location, i.e. balancing ponds and wetlands.

The drainage strategy for this development will incorporate prevention by using rainwater harvesting systems, these systems reduce the total runoff volume from the developed site and reduces overall water consumption. A rainwater harvesting tank shall be implemented and utilised as greywater for the office WC for each building on the development. Site control measures such as the attenuation basins will be sized to store and control storm water for the most extreme events.

5.3 – General strategy

For details of the outline drainage proposals for the site, reference should be made to drawing (ref: 30206-BGL-XX-XX-DR-C-00250) which has been included in Appendix C of this report.

5.4 – Total site area and impermeable areas

The total drained area of the proposed development has been measured to be 15.8 hectares.

5.5 – Climate Change

In line with the latest guidance and the Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment (SFRA) 2025, a 40% allowance has been made for climate change.

5.6 – Discharge rates

The site is considered to be a greenfield development.

The hydrological characteristics for the site have been taken from uksuds.com and summarised in Table 3 below.

Table 3 – Hydrological characteristics for the site

SAAR (mm)	714
Hydrological region	4
Soil type	4
SPR	0.47

Using the IH124 method (Institute of Hydrology, 1994) and the above hydrological characteristics, the greenfield runoff rates have been set out in Tables 4 and 5.

Table 4 – Eastern Catchment Greenfield runoff rates (6.3 hectares)

QBAR	31.1 l/s
Q(1)	25.8 l/s
Q(30)	62.3 l/s
Q(100)	80 l/s

Table 5 – Western Catchment Greenfield runoff rates (9.5 hectares)

QBAR	46.9 l/s
Q(1)	39 l/s
Q(30)	69.9 l/s
Q(100)	120.6 l/s

A betterment to the final discharge rates for both catchments shall be provided to improve the flooding risks within the local catchment.

A reduction of 20% will be applied to the QBAR (4.94 l/s/ha) discharge rate for the eastern catchment to provide betterment to the existing watercourse downstream, the maximum discharge into the eastern catchment will not exceed 24.9 l/s for all storms up to and including the 1 in 100-year storm plus a 40% allowance for climate change.

Table 6 – Proposed betterment to greenfield runoff rates

Eastern Catchment	Existing	Proposed	Betterment
QBAR	31.1 l/s	24.9 l/s	20%
Q(1)	25.8 l/s	24.9 l/s	3.6%
Q(30)	62.3 l/s	24.9 l/s	60%
Q(100)	80 l/s	24.9 l/s	69%

A reduction of 57% will be applied to the QBAR (4.94 l/s/ha) discharge rate for the western catchment to provide betterment to the existing watercourse downstream and match the existing flows that are expected to discharge from the onsite ditch, which connects into the A50 drainage system, via an existing 150mm drain. The current flow into this ditch has been calculated based on a sub-catchment of 4.1ha (sub-catchment outlined on drawing ref: 30206-BGL-XX-XX-DR-C-00255). Flow controls will be used to ensure discharge to this ditch, in the post development scenario, will not exceed the existing flows of 20l/s. The maximum discharge into the western catchment will not exceed 20 l/s for all storms up to and including the 1 in 100-year storm plus a 40% allowance for climate change.

Table 7 – Proposed betterment to greenfield runoff rates

Western Catchment	Existing	Proposed	Betterment
QBAR	46.9 l/s	20 l/s	57%
Q(1)	39 l/s	20 l/s	48%
Q(30)	69.9 l/s	20 l/s	72%
Q(100)	120.6 l/s	20 l/s	83%

For further details on the drainage catchments and discharge rates for the site, reference should be made to drawings (ref: 30206-BGL-XX-XX-DR-C-0251 and 30206-BGL-XX-XX-DR-C-0255), which are included in Appendix C of this report.

The betterment to the existing discharge rates, as stated above, aims to provide a reduction in offsite flood risk within the local catchment. A significant volume of attenuation is proposed onsite to retain flows and allow a reduced, controlled and slower discharge into the existing drainage networks post-development.

5.7 – Attenuation storage

In order to discharge the surface water runoff from the developed site as described above, on site surface water attenuation storage will be required to temporarily store the residual volume of surface water for all rainfall events.

Attenuation will be provided in the form of attenuation ponds.

The attenuation storage will be designed to ensure that there is no surface water flooding on site for rainfall events up to and including the 1 in 30 year storm event. The attenuation storage will be designed to ensure that surface water runoff for storm events up to and including the 100 year storm plus a 40% allowance for climate change will not cause a risk of flooding to properties or increase the flood risk outside of the site.

Areas of exceedance are shown in the hydraulic calculations in the extreme rainfall events (1 in 100 year events); all exceedance shall be contained within the area of dock levellers which are below ground and shall not pose a risk to the development or the local catchment. An exceedance plan can be found in Appendix F of this document.

A hydraulic modelling exercise of the proposed drainage system has been undertaken to ensure sufficient attenuation capacity is provided. The hydraulic calculations for this exercise can be found in Appendix E of this document.

The hydraulic calculations present that the drainage network has been designed to successfully manage surface water flows onsite, ensuring no exceedances from the drainage networks arise in the storm events up to and including a 1:30 year event and all volumes of exceedance within a 1:100 year event can be safely managed onsite.

5.8 – Water quality

Water quality has been considered, and the following measures have been included within the surface water drainage proposals:

- All drainage from car park areas, which are considered low risk, will pass through a Class 1 by-pass separator plus at least one attenuation pond which will provide multiple stages of treatment prior to discharging.
- All drainage from service yards, which are considered high risk, will pass through a Class 1 full retention separator plus at least one attenuation pond which will provide multiple stages of treatment prior to discharging.
- All drainage from the site roads and other hard surfaces will pass through an attenuation pond which will provide treatment for runoff from these areas.
- Silt will be prevented from entering the system using channels with silt traps and catch pits where required.

5.9 – Maintenance

Reference should be made to the Drainage Inspection and Maintenance Schedule in Appendix F, which includes required actions and typical frequencies for all drainage infrastructure serving the development.

The drainage will be managed and maintained by an appointed Management Company.

6.0 – FOUL WATER DRAINAGE STRATEGY

It is currently proposed to discharge the foul flows generated from the development to the existing public foul sewer, the closest feasible Severn Trent Water connection is a manhole approximately 450m to the south of the site (ref.7601) on Ashby Road, existing sewer plans can be found in Appendix G of this report. Due to the distance and existing ground profile, it would not be considered feasible to achieve a gravity connection to this sewer therefore, it is proposed for a pumping station will be located to the south of the site which will pump foul flows towards this sewer via a rising main.

It is proposed to route the rising main within Alter Stones Lane to the Severn Trent Sewer, this will require approximately 800m of offsite construction works in the form of a rising main and associated air valves and washout chambers to suit the detailed design.

A predevelopment enquiry has been made to Severn Trent Water regarding this connection point which advises manhole ref. 7601 as the most appropriate connection point, this correspondence can be found in Appendix H of this report.

Based on a gross internal floor space of 64,794 square metres, it is anticipated that the average flow from the development will be 1.2 l/s, pumped at a rate of 4 l/s. For the connection into the existing Severn Trent Sewer, a Section 106 agreement shall be sought.

Average flows have been calculated using the following formula:

$$6DWF = 6PG + I + 3E$$

Where:

6DWF = foul drainage design flow (l/d)

P = population= 165 persons per hectare

G = water consumption = 90 l/person/day

I = dry weather infiltration = 10%

E = trade effluent = 0 l/s/ha

7.0 - MITIGATION / MANAGEMENT OF FLOOD RISK

7.1 – Access and egress

Access to the site shall be gained via the proposed junction connecting the development to the A50. Egress from the site shall be gained through the proposed junction connecting onto Whitwick Road. Both access and egress roads are located within flood zone 1. Therefore, a safe means of access / egress is available to the site at all times.

7.2 - Drainage & exceedance flow routes

The proposed surface water drainage system has been designed in accordance with the drainage strategy set out in Section 5 of this report. This will ensure that there is no increase in flood risk to the site or elsewhere in the local catchment for all storm events up to and including the 100 year storm plus 40% climate change. Areas of exceedance are shown in the hydraulic calculations in the extreme rainfall events; all exceedances shall be contained within the area of dock levellers which are below ground. An exceedance plan can be found in Appendix F of this document.

It should be noted that if storm events in excess of the 100 year storm plus 40% climate change or blockages occur, this will result in flood water arising from the site drainage system. This will be contained within the yards, car parks and roads until maintenance has been carried out and the levels recede.

8.0 – CONCLUSION

This Flood Risk Assessment and Drainage Strategy has concluded that the development is appropriate and can be occupied safely subject to implementation of the flood risk mitigation described in this report being carried out.

The proposals set out within this document shall ensure that the development will not increase flood risk to the local catchment. The sustainable drainage system proposed, including multiple attenuation ponds and flow control measures will result in a betterment to the existing discharge rates pre-development which aims to reduce the flood risk within the local catchment.

A long-term maintenance plans shall be in place to ensure the drainage system has longevity and continues to perform as designed throughout the operation of the development.

9.0 – BREEAM POL 03 COMPLIANCE

Prerequisite	1. An appropriate consultant, Burrows Graham, has been appointed to carry out and demonstrate compliance with all criteria.
Flood Resilience	2. This document provides a site specific FRA and confirms that the development is defined as having a low annual probability of flooding. The measures set out in this report shall ensure that the development has high flood resilience and minimises the impact of flooding on properties within the development and surrounding area.
Surface Water Run-off Rate	5. In line with the latest guidance and the Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment (SFRA) 2025, a 40% allowance has been made for climate change. All surface water run-off design solutions are bespoke, taking account of the specific site requirements and natural or man-made environment of and surrounding the site. This report details the methodology for disposal of surface water, following the hierarchy outlined in building regulation's part H. 7. The surface water shall be restricted to greenfield runoff rate (QBAR) with a 20% betterment applied (24.1 l/s) for the eastern catchment and 57% betterment (20 l/s) applied for the western catchment meaning the peak run-off rate from the site shall be lower than the pre-development site. This rate shall be utilised for all storm events up to and including 1:100 year plus a 40% allowance for climate change. The predevelopment rates are given in Table 4 of this document. The reduced rate can be achieved by attenuating flows within the various SuDS ponds across the development. 8. The drainage will be managed and maintained by an appointed Management Company, a copy of the proposed maintenance strategy has been included in this document. 9. A hydraulic modelling exercise of the proposed drainage system has been undertaken and included in this document with an appropriate allowance for climate change.
Surface Water Runoff Volume	10. In line with the latest guidance and the Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment (SFRA) 2025, a 40% allowance has been made for climate change. If the site drainage system were to flood, it is considered that any surface water arising from the site drainage system would be contained within the area of dock levellers which are below ground and will not affect any property within the development or surrounding areas. 11. The pre-development volume of runoff and post development volume of runoff (prior to mitigation) are assumed to be the same as infiltration is not considered feasible so all runoffs would eventually be routed towards the existing watercourse. Estimated volume of runoff based on site area, rainfall intensity and 6-hour duration storm event, plus a 40% allowance for climate change is 8,300m³.

	Due to the mitigation measures in place the proposed discharged volume from the site in 100 year 6 hour +40cc storm event shall be much lower than the predevelopment volume due to the reduced discharge rate and the various attenuation ponds storing and holding the water on-site for a longer period than the existing scenario, discharging the runoff volume over a longer period. Proposed discharge volume for 6 hr 1:100 year storm event plus 40% climate change = 970m³ Total additional volumes of runoff which can be held on-site within the attenuation ponds is circa 14,200m³ 12. Infiltration is not viable due to the ground conditions; the above point highlight show the Suds ponds will manage surface water runoff achieving a better post-development scenario for this storm event. 14. Final discharge rate has been limited to lower than the predevelopment discharge rates (QBAR). 15. The drainage will be managed and maintained by an appointed Management Company, a copy of the proposed maintenance strategy has been included in this document. 16. A hydraulic modelling exercise of the proposed drainage system has been undertaken and included in this document with an appropriate allowance for climate change.
Minimising Watercourse Pollution	17. The use of infiltration is not a feasible solution for this site given the site conditions and therefore it is not possible to prevent discharge from rainfall events up to 5mm for the entire proposed impermeable area. However, the BREEAM guidance states that: "In a small number of sites it may not be possible for the first 5mm of rainfall to be prevented from leaving site completely. Where this is the case, an appropriately qualified professional must design the system to ensure that the intent of this criterion has been met as far as possible and provide justifications to explain why the criterion could not be fully achieved on the site. Where this can be justified, the awarding of the water quality credit would not be affected, provided all other relevant criteria have been achieved." Although infiltration is not feasible, measures are implemented within the drainage design to reduce and delay the discharge into the watercourse, such as the series of attenuation ponds restricted to low rates to delay the flows. Watercourse pollution and environmental damage has been considered, refer to section 5.8 of this document for details. 18. Areas which are considered low risk, will pass through a Class 1 by-pass separator plus at least one attenuation ponds which will provide multiple stages of treatment prior to discharging. 19. Areas which are considered high risk, will pass through a Class 1 full retention separator plus at least one attenuation ponds which will provide multiple stages of treatment prior to discharging.

	20. Chemical or liquid gas is not intended on this development. 21. All water pollution prevention systems have been designed inline with industry best practice guidance and the SuDS manual. 22. A detailed drainage plan has been included in this document. 23. The drainage will be managed and maintained by an appointed Management Company. Relevant maintenance agreements shall be available upon completion/occupation. 24. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.
--	---

10.0 – BS 8533:2017 HIERARCHY APPROACH

A risk based approach ,in line with Section 5 of the British Standard BS 8533:2017, has been applied to this development. The stages of the approach are as follow;

Stage 1 – Assessing and understanding the flood risk.

Stage 2 – Avoiding the risk.

Stage 3 – Substitution.

Stage 4 – Land raising, flood control/surface water management incorporation

Stage 5 – Resistant/resilient building techniques.

Stage 6 – Safety.

Each of these stages has been considered and application of each stage is presented below;

Stage 1- The contents of this document assess the risk of flooding from all sources. A sound understanding of the variation of flood risk across the development has been understood and it has been determined that flooding from any source does not pose a considerable risk to the development.

Stage 2 - The only areas which are to be developed with an identified risk of flooding are where surface water flooding is shown in the centre of the site on the EA maps. As described in section 4.2 of this document, the surface water flooding shown in this location is localised to the low lying land where existing ditches are situated, the ditch shall be removed as part of these works and any surface water flooding shall be mitigated through the development of the site and the proposed drainage designs.

Stage 3 – Substitution is not required as there shall be no areas of the development vulnerable to flooding.

Stage 4 – Flood risk will be managed throughout the development through the proposed levels and sustainable drainage designs. Finished levels fall away from all buildings directing flow paths into external areas such as the service yards and carparking areas. All surface water will be collected and attenuated on site through sustainable techniques. Any exceedance from the surface water drainage system shall be contained safely within low-lying areas of the development until flood levels reside.

Stage 5 –This is not required as appropriate mitigation is provided by way of Stage 4 measures.

Stage 6 - Both access and egress roads are located within flood zone 1. Therefore, a safe means of access / egress is available to the site at all times. Safe places of refuge are available on site in the case of extreme events.

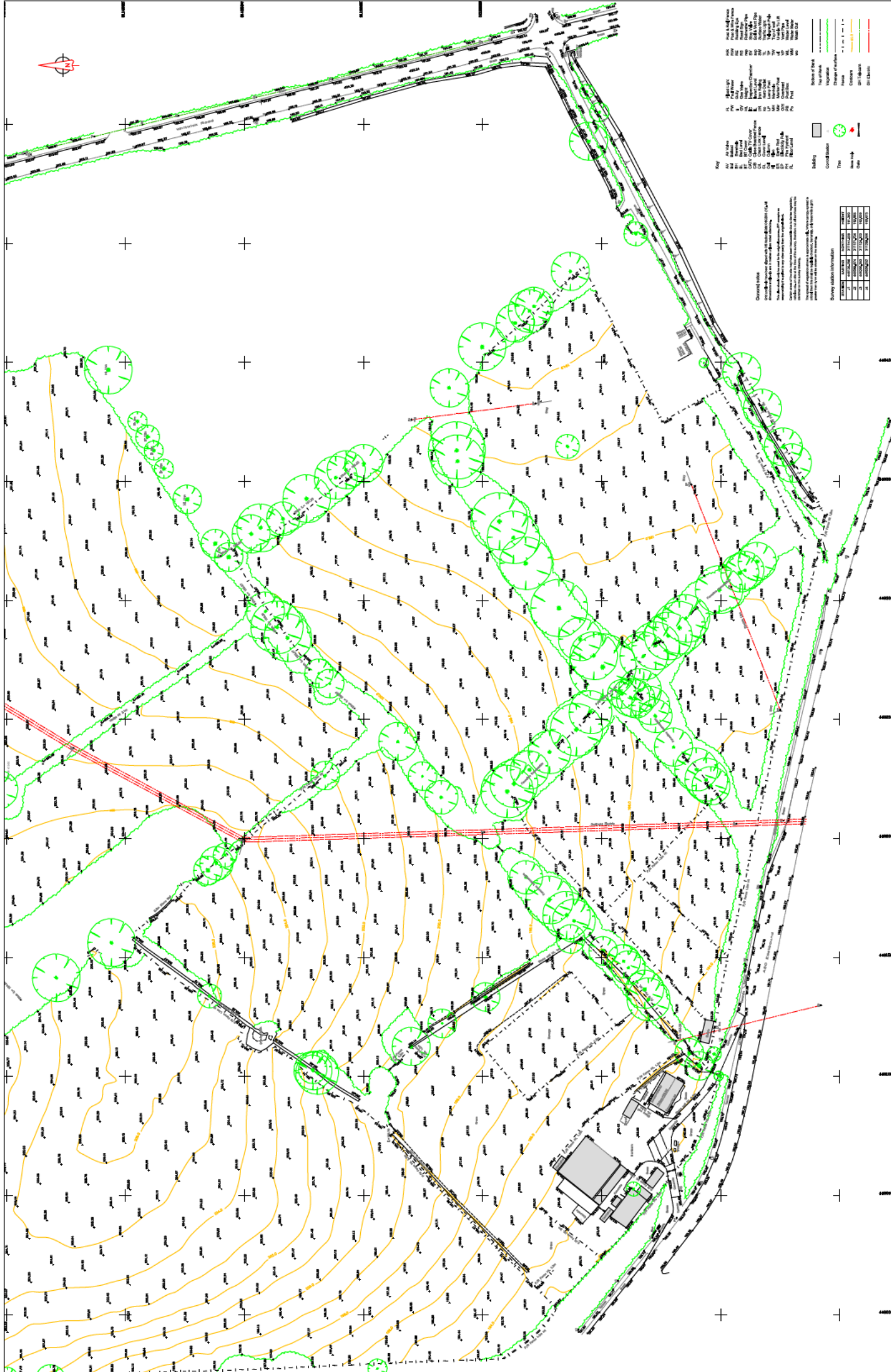
APPENDIX A – SITE LAYOUT



SCHEDULE OF ACCOMMODATION			
(Gross Internal Area)			
Total Area	637440 m ²	64734 m ²	
Site Area	60.79 acres	25.24 ha	
Green Infrastructure	35.79 acres	14.43 ha	
Road Infrastructure	3.54 acres	1.59 ha	
Site Density	48.72%		
Unit 01			
Warehouse	137050 m ²	137050 m ²	
Offices including ground floor core	43341 m ²	43341 m ²	
Total Area	137050 m ²	137050 m ²	
Unit 02			
Warehouse	226551 m ²	226551 m ²	
Offices including ground floor core	44259 m ²	44259 m ²	
Offices including ground floor core	11475 m ²	11475 m ²	
Offices including ground floor core	301 m ²	301 m ²	
Total Area	226551 m ²	226551 m ²	
Unit 03			
Warehouse	137050 m ²	137050 m ²	
Offices including ground floor core	43341 m ²	43341 m ²	
Offices including ground floor core	11475 m ²	11475 m ²	
Offices including ground floor core	301 m ²	301 m ²	
Total Area	226551 m ²	226551 m ²	
Unit 04			
Warehouse	137050 m ²	137050 m ²	
Offices including ground floor core	43341 m ²	43341 m ²	
Offices including ground floor core	11475 m ²	11475 m ²	
Offices including ground floor core	301 m ²	301 m ²	
Total Area	226551 m ²	226551 m ²	
Unit 05			
Warehouse	137050 m ²	137050 m ²	
Offices including ground floor core	43341 m ²	43341 m ²	
Offices including ground floor core	11475 m ²	11475 m ²	
Offices including ground floor core	301 m ²	301 m ²	
Total Area	226551 m ²	226551 m ²	
Unit 06			
Warehouse	137050 m ²	137050 m ²	
Offices including ground floor core	43341 m ²	43341 m ²	
Offices including ground floor core	11475 m ²	11475 m ²	
Offices including ground floor core	301 m ²	301 m ²	
Total Area	226551 m ²	226551 m ²	

Project Name		Land at Junction 22 M1, Cliffe Hill Farm	
Employer		Cadillac Developments Limited	
Project Address		Land at Junction 22 M1, Cliffe Hill Farm, Market Harborough, Leicestershire, LE16 9JL	
Status		Approved	
3 - Spatial Coordination		Approved	
Drawn		Created	
JT		SDB	
UMC Substances		Scale	
24473		1:2000	
Document Title		Proposed Masterplan	
Document Reference		24473 - UMC - ZZZZ - ZZ - DR - A - 0601	
Revision Note		PLANNING ISSUE	

APPENDIX B – TOPOGRAPHICAL SURVEY



Key

1:1	2:1	3:1	4:1	5:1	6:1	7:1	8:1	9:1	10:1	11:1	12:1	13:1	14:1	15:1	16:1	17:1	18:1	19:1	20:1	21:1	22:1	23:1	24:1	25:1	26:1	27:1	28:1	29:1	30:1	31:1	32:1	33:1	34:1	35:1	36:1	37:1	38:1	39:1	40:1	41:1	42:1	43:1	44:1	45:1	46:1	47:1	48:1	49:1	50:1	51:1	52:1	53:1	54:1	55:1	56:1	57:1	58:1	59:1	60:1	61:1	62:1	63:1	64:1	65:1	66:1	67:1	68:1	69:1	70:1	71:1	72:1	73:1	74:1	75:1	76:1	77:1	78:1	79:1	80:1	81:1	82:1	83:1	84:1	85:1	86:1	87:1	88:1	89:1	90:1	91:1	92:1	93:1	94:1	95:1	96:1	97:1	98:1	99:1	100:1
-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------

Building

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Change of Surface

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Other

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Geotechnical Data

Station	Soil Type	Depth (m)	Unit Weight (kN/m³)	cohesion (kPa)	friction angle (°)	Saturated Unit Weight (kN/m³)	Water Content (%)	Liquid Limit (%)	Plasticity Index (%)
1	CL	0-1.5	18.5	10	25	20.0	25	45	20
2	CL	1.5-3.0	19.0	12	28	20.5	28	48	22
3	CL	3.0-4.5	19.5	15	30	21.0	30	50	25
4	CL	4.5-6.0	20.0	18	32	21.5	32	52	28
5	CL	6.0-7.5	20.5	20	35	22.0	35	55	30
6	CL	7.5-9.0	21.0	22	38	22.5	38	58	32
7	CL	9.0-10.5	21.5	25	40	23.0	40	60	35
8	CL	10.5-12.0	22.0	28	42	23.5	42	62	38
9	CL	12.0-13.5	22.5	30	45	24.0	45	65	40
10	CL	13.5-15.0	23.0	32	48	24.5	48	68	42

Client: Catalyst Residential

Project: Maitland

Title: Topographical Survey

Drawn By: [Name]

Check By: [Name]

Date: [Date]

Scale: 1:1000

Project No.: [Number]

Revision No.: 01

jpp

Infrastructure Design

- Geotechnical & Environmental
- Structural Engineering
- Planning Services

Surveying

- Professional Advice

11/03/2021

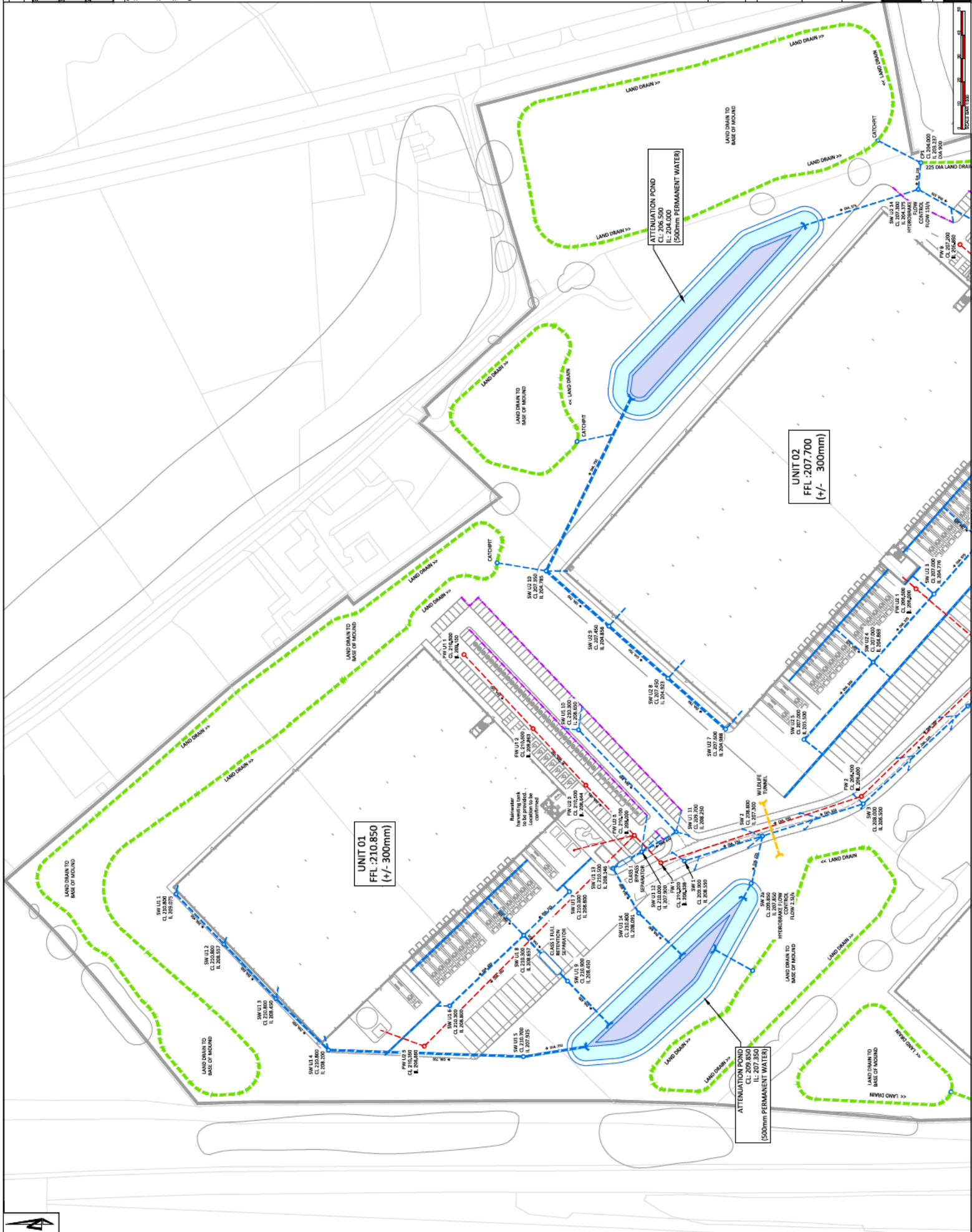
E: mait@jppuk.net

W: jppuk.net

11/03/2021

APPENDIX C – EXISTING CATCHMENT AND PROPOSED DISCHARGE RATE PLANS

APPENDIX D – PROPOSED DRAINAGE STRATEGY



APPENDIX E – HYDRAULIC CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	x
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
U3 1	448100.209	311457.180	203.800	1.500	1200		0	22.000	202.300	300
HIGHWAY POND SOUTH	448220.586	311152.666	195.500	2.000			1	13.018	193.500	600
							0	13.019	193.500	225
5	448192.443	311446.618	206.500	1.500	1200		1	13.008	205.000	300
							0	13.009	205.000	300
8	448226.871	311328.262	203.300	1.656	1350		1	13.011	201.644	450
							0	13.012	201.644	450
13	448201.487	311316.387	202.700	4.701	1200		1	22.009	197.999	300
							0	22.010	197.999	300
14	448220.029	311299.860	201.800	3.884	1350		1	22.010	197.916	300
							2	13.012	200.106	450
							0	13.013	197.916	450
15	448207.470	311271.779	202.300	4.461	1350		1	13.013	197.839	450
							0	13.014	197.943	450
17	448210.693	311201.277	197.000	1.700	1350		1	13.015	195.300	450
							0	13.016	195.300	450
21	448251.483	311130.653	194.700	1.500	1200					
							0	3.000	193.200	300
23	448249.373	311166.253	196.300	3.375	1350		1	3.001	193.000	450
							0	3.002	192.925	450
24	448235.468	311171.720	197.000	4.112	1350		1	3.002	192.888	450
							0	3.003	192.888	450
25	448240.492	311185.736	197.000	4.157	1350		1	3.003	192.843	450
							0	3.004	192.843	450
27	448296.507	311125.912	196.300	3.663	1350		1	3.005	192.637	450
							0	3.006	192.637	450
29	448351.894	311114.057	197.200	5.468	1800		1	1.012	191.732	750
							0	1.013	191.732	750
U5 4	448380.811	311233.077	196.600	1.650	1350					
							0	6.000	194.950	450
U5 6	448334.509	311198.222	196.600	2.276	1500		1	6.001	194.324	600
							0	6.002	194.325	600
33	448538.391	311132.228	193.500	1.500	1200					
							0	12.000	192.000	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
34	448514.829	311135.974	194.000	2.757	1800		1 12.000 2 11.001 3 1.016 0 1.017	191.768 191.768 191.243 191.243	225 225 750 750
HIGHWAY POND EAST	448515.443	311166.267	193.500	2.500			1 1.017 0 1.018	191.000 191.000	750 300
EAST OUTFAL	448523.851	311204.388	191.000	1.000	1200		1 1.019	190.000	300
7	448225.278	311353.460	204.500	2.388	1350		1 19.008 2 13.010 0 13.011	202.487 202.800 202.112	225 450 450
12	448134.265	311363.338	201.900	3.628	1200		1 22.008 0 22.009	198.308 198.272	225 300
U3 5	448071.872	311398.699	203.100	1.425	1200		0 23.000	201.675	225
26	448260.596	311170.090	196.000	3.221	1350		1 3.004 0 3.005	192.779 192.779	450 450
30	448388.201	311118.177	196.500	4.841	1800		1 1.013 0 1.014	191.659 191.659	750 750
31	448452.202	311143.416	196.500	4.980	1800		1 8.000 2 1.014 0 1.015	192.629 191.521 191.520	225 750 750
32	448491.296	311142.278	194.300	3.008	1800		1 9.001 2 1.015 0 1.016	192.192 191.292 191.292	300 750 750
16	448203.606	311239.582	198.000	1.700	1350		1 13.014 0 13.015	196.300 196.300	450 450
22	448256.213	311149.413	195.300	2.239	1350		1 3.000 0 3.001	193.136 193.061	300 450
19	448201.729	311184.551	197.000	1.897	1500		1 27.007 2 13.016 0 13.017	195.103 195.253 195.103	225 450 600
20	448215.390	311169.789	196.900	1.847	1500		1 13.017 0 13.018	195.053 195.053	600 600
35	448503.833	311180.730	193.500	2.686	1200		1 1.018 0 1.019	190.814 190.814	300 300
U2 POND 1	448323.828	311592.805	206.500	2.000			1 1.003 0 1.004	204.500 204.500	750 375
U2 17	448256.550	311384.451	205.300	1.997	1500		1 19.005 0 19.006	203.303 203.303	600 600
U 1 POND	448022.119	311614.907	209.850	2.000			1 15.002 2 14.004 3 13.004 0 13.005	207.850 207.850 207.850 207.850	450 600 750 225
3	448109.438	311535.362	208.000	1.500	1200		1 13.006 0 13.007	206.500 206.500	225 225
U1 7	448072.169	311659.944	210.300	1.500	1200		0 16.000	208.800	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
U2 4	448169.570	311531.161	207.000	2.011	1350		1 20.000 2 19.000 0 19.001	205.215 205.064 204.989	225 300 375
U2 DOCK 2	448183.627	311546.942	206.500	0.700	1200		0 20.000	205.800	225
U2 2	448221.059	311485.297	207.000	2.299	1350		1 21.000 2 19.002 0 19.003	205.387 204.776 204.701	225 375 450
U2 7	448141.143	311593.720	207.600	2.612	1800		0 1.000	204.988	750
U4 2	448054.746	311355.551	201.700	1.700	1200		0 25.000	200.000	225
U4 5	448038.009	311338.943	201.100	1.860	1350		1 26.000 2 25.000 0 25.001	199.398 199.475 199.240	300 225 450
U3 POND	448003.140	311357.902	201.000	2.000			1 25.001 2 22.004 0 22.005	199.000 199.500 199.000	450 600 225
U4 9	448177.532	311242.804	201.400	2.949	1500		1 27.003 0 27.004	198.601 198.451	450 600
U4 10	448137.336	311187.181	201.400	1.700	1350		0 29.000	199.700	450
U4 11	448157.231	311214.711	201.400	3.122	1500		1 29.000 2 27.004 0 27.005	198.428 198.278 198.278	450 600 600
U 4 POND	448179.598	311197.596	199.000	2.500			1 27.005 0 27.006	196.500 196.500	600 225
U4 1	448077.792	311345.492	201.400	1.500	1350		0 27.000	199.900	375
U4 8	448184.792	311274.411	201.000	2.291	1350		1 27.002 0 27.003	198.747 198.709	450 450
U3 DOCK	448022.507	311438.070	202.750	0.800	1200		0 24.000	201.950	150
U4 DOCK	448128.663	311285.966	200.250	0.800	1200		0 28.000	199.450	225
U4 6	448142.742	311305.449	201.000	1.865	1350		1 28.000 2 27.000 0 27.001	199.210 199.135 199.135	225 375 375
U5 DOCK	448291.772	311246.119	195.400	0.800	1200		0 4.000	194.600	150
U5 2	448268.895	311227.247	196.300	2.048	1350		1 5.000 2 4.000 0 4.001	194.402 194.402 194.252	300 150 450
1	448085.141	311611.176	209.900	1.350	1200		0 18.000	208.550	150
9	448022.844	311364.640	201.000	2.104	1200		1 22.005 0 22.006	198.896 198.896	225 225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
10	448059.653	311381.135	202.850	4.156	1200		1	22.006	198.694	225
							0	22.007	198.694	225
11	448098.507	311376.395	202.100	3.602	1200		1	22.007	198.498	225
							0	22.008	198.498	225
U4 7	448167.332	311287.337	201.000	2.144	1350		1	27.001	198.931	375
							0	27.002	198.856	450
U5 3	448287.428	311203.551	196.300	2.348	1500		1	4.001	194.102	450
							0	4.002	193.952	600
U1 5	448002.154	311679.509	210.700	2.775	1800		1	13.003	207.925	750
							0	13.004	207.925	750
U1 6	448023.711	311710.675	210.300	1.500	1350					
							0	15.000	208.800	450
U1 DOCK	448069.159	311694.360	209.600	0.800	1200					
							0	17.000	208.800	150
U1 8	448053.645	311679.464	210.300	1.643	1350		1	17.000	208.657	150
							2	16.000	208.657	225
							3	15.000	208.657	450
							0	15.001	208.657	450
U1 9	448034.192	311660.757	210.900	2.450	1350		1	15.001	208.450	450
							0	15.002	208.450	450
U1 12	448089.000	311629.381	210.000	1.807	1500		1	14.001	208.193	600
							0	14.002	208.193	600
U1 13	448082.054	311641.500	210.500	2.354	1500		1	14.002	208.146	600
							0	14.003	208.146	600
U1 14	448063.022	311630.529	210.800	2.709	1500		1	14.003	208.091	600
							0	14.004	208.091	600
2	448098.267	311570.767	208.800	1.500	1200		1	18.000	207.300	150
							2	13.005	207.300	225
							0	13.006	207.300	225
4	448150.941	311490.990	207.400	1.575	1200		1	13.007	205.900	225
							0	13.008	205.825	300
6	448205.182	311423.031	206.100	1.650	1350		1	13.009	204.600	300
							0	13.010	204.450	450
U3 2	448077.928	311431.454	203.800	1.745	1350		1	22.000	202.130	300
							0	22.001	202.055	375
U3 3	448060.774	311411.649	203.800	1.901	1350		1	22.001	201.899	375
							0	22.002	201.899	450
U3 6	448060.293	311400.357	203.300	1.742	1200		1	23.000	201.558	225
							0	23.001	201.558	300
U3 4	448040.067	311402.933	203.600	2.546	1500		1	23.001	201.354	300
							2	22.002	201.219	450
							0	22.003	201.054	600
U3 7	447997.628	311410.207	202.950	1.650	1200		1	24.000	201.300	150
							0	24.001	201.300	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
U3 8	448024.763	311385.798	202.950	2.200	1500		1 2	24.001 22.003	201.049 200.824	300 600
							0	22.004	200.750	600
U4 3	448032.218	311330.600	201.100	1.600	1200		0	26.000	199.500	300
19 A	448190.690	311187.634	200.000	3.575	1200		1	27.006	196.425	225
							0	27.007	196.425	225
28	448314.529	311122.054	196.600	4.159	1800		1 2	4.004 3.006	192.441 192.591	600 450
							0	3.007	192.441	750
U6 1	448450.100	311119.697	194.600	1.425	1200		0	8.000	193.175	225
U6 4	448512.346	311124.763	194.600	1.425	1200		0	9.000	193.175	225
U6 5	448469.489	311136.179	194.600	1.425	1200		0	10.000	193.175	225
U6 6	448489.253	311131.253	194.600	1.904	1200		1 2	10.000 9.000	192.771 192.771	225 225
							0	9.001	192.696	300
U6 2	448531.690	311095.039	194.300	1.425	1200		0	11.000	192.875	225
U6 3	448536.306	311111.994	194.300	1.721	1200		1	11.000	192.579	225
							0	11.001	192.579	225
U5 1	448251.539	311249.489	196.300	1.500	1200		0	5.000	194.800	300
U5 5	448356.511	311214.683	196.600	2.139	1500		1	6.000	194.611	450
							0	6.001	194.461	600
U5 7	448307.428	311177.599	196.400	2.612	1500		1 2	6.002 4.002	193.788 193.788	600 600
							0	4.003	193.788	600
U2 1	448254.872	311455.178	207.000	2.410	1350		1	19.003	204.590	450
							0	19.004	204.590	450
U2 DOCK 1	448235.194	311501.247	206.500	0.700	1200		0	21.000	205.800	225
U2 3	448198.536	311505.360	207.000	2.131	1350		1	19.001	204.869	375
							0	19.002	204.869	375
U2 5	448136.741	311560.404	207.000	1.500	1200		0	19.000	205.500	300
U2 8	448162.699	311618.125	207.450	2.527	1800		1	1.000	204.923	750
							0	1.001	204.923	750
U2 9	448184.854	311643.208	207.450	2.594	1800		1	1.001	204.856	750
							0	1.002	204.856	750
U2 10	448208.305	311669.792	207.350	2.565	1800		1	1.002	204.785	750
							0	1.003	204.785	750

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
U2 20	448354.444	311483.993	206.800	1.840	1350		1 2.000	205.035	300
						0	2.001	204.960	375
U2 19	448325.122	311449.947	206.800	1.500	1200		0 2.000	205.300	300
						0	19.006	203.177	600
U2 18	448255.674	311371.880	205.000	1.823	1500		1 19.007	203.177	600
						0	19.007	203.177	600
U5 10	448318.473	311156.591	196.800	3.131	1500		1 7.001	194.781	300
						2	4.003	193.669	600
						0	4.004	193.669	600
U1 4	448004.900	311762.107	210.800	2.600	1800		1 13.002	208.345	600
						0	13.003	208.200	750
U1 1	448071.106	311826.861	210.800	1.725	1350		0 13.000	209.075	450
						0	13.000	208.707	450
U1 2	448049.869	311806.525	210.800	2.243	1500		1 13.001	208.557	600
						0	13.001	208.451	600
U1 3	448026.754	311784.635	210.800	2.350	1500		1 13.002	208.450	600
						0	13.002	208.450	600
U1 10	448140.860	311656.066	210.300	1.650	1200		0 14.000	208.650	300
						0	14.000	208.250	300
U1 11	448097.547	311614.719	209.700	1.450	1500		1 14.001	208.250	600
						0	14.001	208.250	600
U5 8	448331.224	311176.008	196.800	1.500	1200		0 7.000	195.300	300
						0	7.000	195.156	300
U5 9	448336.678	311169.467	196.800	1.644	1200		1 7.001	195.156	300
						0	2.001	204.828	375
U2 14	448370.307	311511.984	207.100	2.725	1800		2 1.004	204.375	375
						1	1.005	204.375	225
CP1	448381.647	311510.993	204.000	0.763	1200		1 1.005	203.237	225
						0	1.006	203.237	225
CP2	448388.613	311454.763	201.900	1.200	1200		1 1.006	200.700	225
						0	1.007	200.700	225
CP3	448303.133	311362.836	199.400	1.000	1200		1 1.007	198.400	225
						0	1.008	198.400	300
CP4	448430.434	311207.012	193.950	1.250	1200		1 1.008	192.700	300
						0	1.009	192.700	300
CP5	448376.819	311171.597	195.300	2.990	1200		1 1.009	192.486	300
						0	1.010	192.310	300
CP6	448335.452	311131.746	196.500	4.382	1200		1 1.010	192.119	300
						0	1.011	192.118	300
28A	448332.230	311118.303	197.200	5.428	1800		1 3.007	191.772	750
						2	1.011	192.072	300
						0	1.012	191.772	750

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
U2-16	448292.071	311418.377	206.100	2.183	1500		1	19.004	204.067	450
							0	19.005	203.917	600
U2 POND 2	448254.570	311358.841	204.650	1.500			1	19.007	203.150	600
							0	19.008	203.150	225
19C	448108.261	311165.396	194.600	2.000	1200		1	13.020	192.600	225
							0	13.021	192.600	150
WEST OUTFALL	448103.895	311160.010	194.000	1.600	1200		1	13.021	192.400	150
19B	448179.037	311157.457	195.500	2.050	2100		1	13.019	193.450	225
							0	13.020	193.450	225

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Additional Storage (m³/ha)	20.0
Rainfall Events	Singular	Winter CV	0.840	Starting Level (m)	
FSR Region	England and Wales	Analysis Speed	Normal	Check Discharge Rate(s)	x
M5-60 (mm)	20.000	Skip Steady State	x	Check Discharge Volume	x
Ratio-R	0.400	Drain Down Time (mins)	240		

Storm Durations

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

Node HIGHWAY POND EAST Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.018	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0197-2490-2500-2490
Invert Level (m)	191.000	Min Outlet Diameter (m)	0.225
Design Depth (m)	2.500	Min Node Diameter (mm)	2100
Design Flow (l/s)	24.9		

Node 23 Online Orifice Control

Flap Valve	✓	Invert Level (m)	192.925	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.300		

Node U 1 POND Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	13.005	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0066-2500-1800-2500
Invert Level (m)	207.850	Min Outlet Diameter (m)	0.100
Design Depth (m)	1.800	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.5		

Node U2 14 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	204.375	Product Number	CTL-SHE-0160-1500-2000-1500
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	15.0	Min Node Diameter (mm)	1800

Node U2 POND 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	19.008	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0124-8000-1500-8000
Invert Level (m)	203.150	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.500	Min Node Diameter (mm)	1500
Design Flow (l/s)	8.0		

Node U3 POND Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	22.005	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0088-4500-1900-4500
Invert Level (m)	199.000	Min Outlet Diameter (m)	0.100
Design Depth (m)	1.900	Min Node Diameter (mm)	1200
Design Flow (l/s)	4.5		

Node U 4 POND Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	27.006	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0095-6000-2500-6000
Invert Level (m)	196.500	Min Outlet Diameter (m)	0.150
Design Depth (m)	2.500	Min Node Diameter (mm)	1200
Design Flow (l/s)	6.0		

Node 19B Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	13.020	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0184-2000-2000-2000
Invert Level (m)	193.450	Min Outlet Diameter (m)	0.225
Design Depth (m)	2.000	Min Node Diameter (mm)	1800
Design Flow (l/s)	20.0		

Node HIGHWAY POND EAST Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	191.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	387.0	0.0	2.500	1373.0	0.0

Node HIGHWAY POND SOUTH Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	193.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	203.0	0.0	2.000	1087.0	0.0

Node U2 POND 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	204.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	983.0	0.0	2.000	2529.0	0.0

Node U 1 POND Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	207.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	792.0	0.0	2.000	2506.0	0.0

Node U2 POND 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	203.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	215.0	0.0	1.500	896.0	0.0

Node U3 POND Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	199.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	339.0	0.0	2.000	1091.0	0.0

Node U 4 POND Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	196.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	148.0	0.0	2.500	999.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U3 1	10	202.420	0.120	25.9	0.4301	0.0000	OK
600 minute winter	HIGHWAY POND SOUTH	570	194.085	0.585	36.4	194.7478	0.0000	SURCHARGED
15 minute winter	5	11	205.109	0.109	36.5	0.1989	0.0000	OK
15 minute winter	8	12	201.747	0.103	79.6	0.1972	0.0000	OK
15 minute winter	13	12	198.227	0.228	33.0	0.3263	0.0000	OK
15 minute winter	14	12	198.205	0.289	120.3	0.5245	0.0000	OK
15 minute winter	15	12	198.070	0.231	125.5	0.3726	0.0000	OK
15 minute winter	17	12	195.627	0.327	144.8	0.9900	0.0000	OK
15 minute winter	21	11	193.229	0.029	1.2	0.0365	0.0000	OK
15 minute winter	23	11	192.980	0.055	5.2	0.0878	0.0000	OK
15 minute winter	24	11	192.940	0.052	5.1	0.0745	0.0000	OK
15 minute winter	25	11	192.917	0.074	9.7	0.1173	0.0000	OK
15 minute winter	27	12	192.750	0.113	22.1	0.1824	0.0000	OK
15 minute winter	29	12	192.152	0.420	297.7	1.4284	0.0000	OK
15 minute winter	U5 4	10	195.041	0.091	29.8	0.3637	0.0000	OK
15 minute winter	U5 6	10	194.504	0.180	164.0	1.1264	0.0000	OK
15 minute winter	33	10	192.043	0.042	4.0	0.0641	0.0000	OK
480 minute winter	34	440	191.750	0.507	65.9	1.3923	0.0000	OK
360 minute winter	HIGHWAY POND EAST	344	191.749	0.749	80.0	401.2310	0.0000	SURCHARGED
600 minute winter	EAST OUTFAL	600	190.075	0.075	24.9	0.0000	0.0000	OK
15 minute winter	7	11	202.247	0.135	74.6	0.2459	0.0000	OK
15 minute winter	12	12	198.398	0.126	24.9	0.1943	0.0000	OK
15 minute winter	U3 5	10	201.797	0.122	25.8	0.4507	0.0000	OK
15 minute winter	26	11	192.878	0.099	17.9	0.1800	0.0000	OK
15 minute winter	30	12	192.057	0.398	300.9	1.1290	0.0000	OK
15 minute winter	31	12	191.852	0.332	310.5	0.9013	0.0000	OK
480 minute winter	32	440	191.751	0.459	63.1	1.2531	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U3 1	22.000	U3 2	25.1	0.983	0.321	0.8711	
240 minute winter	HIGHWAY POND SOUTH	13.019	19B	20.1	0.529	0.549	0.3977	
15 minute winter	5	13.009	6	35.7	1.596	0.263	0.6001	
15 minute winter	8	13.012	14	79.8	3.031	0.107	0.7690	
15 minute winter	13	22.010	14	33.3	0.542	0.522	1.5788	
15 minute winter	14	13.013	15	121.0	1.277	0.753	2.9112	
15 minute winter	15	13.014	16	125.5	3.023	0.172	1.3488	
15 minute winter	17	13.016	19	142.2	1.294	0.885	2.0883	
15 minute winter	21	3.000	22	1.2	0.373	0.019	0.0616	
15 minute winter	23	Orifice	24	5.1				
15 minute winter	24	3.003	25	5.2	0.385	0.029	0.2008	
15 minute winter	25	3.004	26	9.7	0.456	0.060	0.5431	
15 minute winter	27	3.006	28	21.2	0.747	0.132	0.5243	
15 minute winter	29	1.013	30	293.2	1.232	0.533	8.9675	
15 minute winter	U5 4	6.000	U5 5	29.1	1.308	0.085	0.6787	
15 minute winter	U5 6	6.002	U5 7	161.7	1.537	0.187	3.6314	
15 minute winter	33	12.000	34	3.9	0.760	0.076	0.1220	
15 minute winter	34	1.017	HIGHWAY POND EAST	375.6	3.472	0.339	4.6960	
600 minute winter	HIGHWAY POND EAST	Hydro-Brake®	35	24.9				
15 minute winter	7	13.011	8	74.5	2.233	0.169	0.8468	
15 minute winter	12	22.009	13	24.2	0.635	0.379	3.5127	
15 minute winter	U3 5	23.000	U3 6	25.4	1.190	0.489	0.2499	
15 minute winter	26	3.005	27	17.7	0.629	0.110	1.6025	
15 minute winter	30	1.014	31	297.6	1.410	0.541	14.6206	
15 minute winter	31	1.015	32	311.8	1.489	0.331	8.2493	
15 minute winter	32	1.016	34	350.5	1.767	0.637	4.8610	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	16	12	196.451	0.151	130.2	0.2922	0.0000	OK
15 minute winter	22	12	193.087	0.026	1.2	0.0374	0.0000	OK
15 minute winter	19	12	195.357	0.254	150.1	0.5274	0.0000	OK
15 minute winter	20	12	195.164	0.111	151.9	0.2252	0.0000	OK
600 minute winter	35	600	190.891	0.077	24.9	0.0871	0.0000	OK
360 minute winter	U2 POND 1	288	204.830	0.330	62.3	366.9991	0.0000	OK
240 minute winter	U2 17	200	203.583	0.280	36.0	0.4951	0.0000	OK
1440 minute winter	U 1 POND	1440	208.470	0.620	23.5	659.0518	0.0000	SURCHARGED
15 minute winter	3	11	206.606	0.106	23.4	0.2054	0.0000	OK
15 minute winter	U1 7	10	208.901	0.101	16.2	0.2680	0.0000	OK
15 minute winter	U2 4	11	205.202	0.213	64.6	0.7976	0.0000	OK
15 minute winter	U2 DOCK 2	10	205.876	0.076	20.2	0.3962	0.0000	OK
15 minute winter	U2 2	11	204.962	0.261	104.8	0.7814	0.0000	OK
15 minute winter	U2 7	11	205.272	0.284	55.6	1.5826	0.0000	OK
15 minute winter	U4 2	10	200.055	0.055	10.0	0.1086	0.0000	OK
600 minute winter	U4 5	585	199.603	0.363	6.0	0.5195	0.0000	OK
600 minute winter	U3 POND	570	199.602	0.602	25.7	273.2639	0.0000	SURCHARGED
15 minute winter	U4 9	11	198.670	0.219	129.0	0.8393	0.0000	OK
15 minute winter	U4 10	10	199.780	0.080	41.8	0.3921	0.0000	OK
15 minute winter	U4 11	11	198.424	0.146	235.1	0.7332	0.0000	OK
480 minute winter	U 4 POND	464	197.404	0.904	33.2	273.7524	0.0000	SURCHARGED
15 minute winter	U4 1	10	200.000	0.100	33.3	0.4601	0.0000	OK
15 minute winter	U4 8	11	198.940	0.231	90.6	0.3303	0.0000	OK
15 minute winter	U3 DOCK	10	202.012	0.062	8.7	0.1668	0.0000	OK
15 minute winter	U4 DOCK	11	199.609	0.159	41.9	1.3628	0.0000	OK
15 minute winter	U4 6	11	199.319	0.184	72.6	0.2635	0.0000	OK
15 minute summer	U5 DOCK	1	194.600	0.000	0.0	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	16	13.015	17	129.8	1.519	0.250	3.3088	
15 minute winter	22	3.001	23	1.1	0.354	0.006	0.0589	
15 minute winter	19	13.017	20	149.5	2.097	0.437	1.4980	
15 minute winter	20	13.018	HIGHWAY POND SOUTH	152.0	4.655	0.075	1.2276	
600 minute winter	35	1.019	EAST OUTFAL	24.9	1.783	0.138	0.4327	980.8
15 minute winter	U2 POND 1	1.004	U2 14	-28.4	-0.530	-0.286	3.6505	
15 minute winter	U2 17	19.006	U2 18	164.6	1.364	0.239	1.5212	
60 minute summer	U 1 POND	Hydro-Brake®	2	1.9				
15 minute winter	3	13.007	4	22.7	1.254	0.439	1.1001	
15 minute winter	U1 7	16.000	U1 8	15.8	0.695	0.420	0.6115	
15 minute winter	U2 4	19.001	U2 3	63.4	0.978	0.573	2.5328	
15 minute winter	U2 DOCK 2	20.000	U2 4	19.8	1.732	0.228	0.2414	
15 minute winter	U2 2	19.003	U2 1	104.2	1.280	0.655	3.6832	
15 minute winter	U2 7	1.000	U2 8	51.7	0.399	0.094	5.7006	
15 minute winter	U4 2	25.000	U4 5	9.8	1.326	0.126	0.1745	
15 minute winter	U4 5	25.001	U3 POND	46.1	1.554	0.184	2.2173	
180 minute summer	U3 POND	22.005	9	3.7	0.597	0.102	0.1317	
15 minute winter	U4 9	27.004	U4 11	128.0	1.804	0.263	2.5287	
15 minute winter	U4 10	29.000	U4 11	41.1	2.232	0.066	0.6265	
15 minute winter	U4 11	27.005	U 4 POND	235.1	3.848	0.135	3.6300	
15 minute summer	U 4 POND	Hydro-Brake®	19 A	4.6				
15 minute winter	U4 1	27.000	U4 6	32.2	0.882	0.161	2.9522	
15 minute winter	U4 8	27.003	U4 9	90.3	1.177	0.486	2.4868	
15 minute winter	U3 DOCK	24.000	U3 7	8.5	0.616	0.362	0.4581	
15 minute winter	U4 DOCK	28.000	U4 6	40.5	1.405	0.780	0.6933	
15 minute winter	U4 6	27.001	U4 7	72.0	1.402	0.442	1.5712	
15 minute summer	U5 DOCK	4.000	U5 2	0.0	0.000	0.000	0.0004	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U5 2	10	194.407	0.155	54.7	0.5491	0.0000	OK
15 minute winter	1	10	208.606	0.056	9.1	0.1160	0.0000	OK
60 minute winter	9	67	198.945	0.049	3.7	0.0552	0.0000	OK
15 minute winter	10	11	198.783	0.089	12.4	0.1355	0.0000	OK
15 minute winter	11	12	198.603	0.105	16.1	0.1359	0.0000	OK
15 minute winter	U4 7	11	199.067	0.211	91.1	0.5869	0.0000	OK
15 minute winter	U5 3	11	194.104	0.152	71.2	0.4347	0.0000	OK
1440 minute winter	U1 5	1440	208.470	0.545	13.3	1.3874	0.0000	OK
15 minute winter	U1 6	12	208.810	0.010	0.6	0.0146	0.0000	OK
15 minute winter	U1 DOCK	11	208.811	0.011	0.4	0.0127	0.0000	OK
15 minute winter	U1 8	10	208.808	0.151	63.8	0.8399	0.0000	OK
15 minute winter	U1 9	10	208.564	0.114	61.2	0.1636	0.0000	OK
1440 minute winter	U1 12	1440	208.470	0.277	3.6	0.9576	0.0000	OK
1440 minute winter	U1 13	1440	208.470	0.324	3.6	0.5728	0.0000	OK
1440 minute winter	U1 14	1440	208.470	0.379	3.4	0.6700	0.0000	OK
15 minute winter	2	11	207.368	0.068	15.4	0.1100	0.0000	OK
15 minute winter	4	11	205.922	0.097	29.9	0.1766	0.0000	OK
15 minute winter	6	11	204.560	0.110	64.2	0.4487	0.0000	OK
15 minute winter	U3 2	10	202.241	0.185	70.6	0.9562	0.0000	OK
15 minute winter	U3 3	10	202.031	0.132	94.7	0.4381	0.0000	OK
15 minute winter	U3 6	10	201.675	0.117	32.6	0.2007	0.0000	OK
15 minute winter	U3 4	11	201.242	0.188	126.1	0.3315	0.0000	OK
15 minute winter	U3 7	10	201.457	0.157	47.9	0.7090	0.0000	OK
15 minute winter	U3 8	11	200.900	0.150	174.1	0.2657	0.0000	OK
15 minute winter	U4 3	10	199.631	0.131	37.1	0.5791	0.0000	OK
15 minute summer	19 A	64	196.450	0.025	4.6	0.0282	0.0000	OK
15 minute winter	28	11	192.625	0.184	277.9	0.5222	0.0000	OK
15 minute winter	U6 1	10	193.236	0.061	12.3	0.1437	0.0000	OK
15 minute winter	U6 4	10	193.240	0.065	11.8	0.1491	0.0000	OK
15 minute winter	U6 5	10	193.235	0.060	11.0	0.1335	0.0000	OK
15 minute winter	U6 6	10	192.797	0.101	48.7	0.3134	0.0000	OK
15 minute winter	U6 2	10	192.966	0.091	21.4	0.2968	0.0000	OK
15 minute winter	U6 3	10	192.666	0.087	25.4	0.1294	0.0000	OK
15 minute winter	U5 1	10	194.890	0.090	24.8	0.3124	0.0000	OK
15 minute winter	U5 5	10	194.649	0.188	93.4	1.1364	0.0000	OK
15 minute winter	U5 7	11	194.093	0.305	239.1	0.6483	0.0000	OK
15 minute winter	U2 1	11	204.789	0.199	124.5	0.5378	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U5 2	4.001	U5 3	53.9	1.163	0.236	1.3937	
15 minute winter	1	18.000	2	9.0	1.323	0.292	0.2881	
120 minute summer	9	22.006	10	3.7	0.593	0.102	0.3412	
15 minute winter	10	22.007	11	12.2	0.752	0.332	0.6347	
15 minute winter	11	22.008	12	15.6	0.881	0.427	0.6765	
15 minute winter	U4 7	27.002	U4 8	90.6	1.313	0.397	1.4998	
15 minute winter	U5 3	4.002	U5 7	71.5	0.725	0.147	3.2785	
15 minute winter	U1 5	13.004	U 1 POND	227.4	2.539	0.357	2.9829	
15 minute winter	U1 6	15.000	U1 8	-0.6	-0.031	-0.003	1.0153	
15 minute winter	U1 DOCK	17.000	U1 8	-0.4	-0.040	-0.025	0.1955	
15 minute winter	U1 8	15.001	U1 9	61.2	1.609	0.216	1.0542	
15 minute winter	U1 9	15.002	U 1 POND	62.5	2.850	0.127	1.0278	
15 minute winter	U1 12	14.002	U1 13	62.8	0.935	0.159	0.9391	
15 minute winter	U1 13	14.003	U1 14	62.8	1.169	0.183	1.1896	
15 minute winter	U1 14	14.004	U 1 POND	62.8	1.985	0.093	1.2519	
15 minute winter	2	13.006	3	15.3	1.104	0.200	0.5288	
15 minute winter	4	13.008	5	29.6	1.385	0.228	1.3002	
15 minute winter	6	13.010	7	63.1	2.136	0.129	2.1391	
15 minute winter	U3 2	22.001	U3 3	69.4	1.576	0.451	1.1649	
15 minute winter	U3 3	22.002	U3 4	94.0	2.558	0.167	0.8262	
15 minute winter	U3 6	23.001	U3 4	32.1	1.329	0.289	0.4943	
15 minute winter	U3 4	22.003	U3 8	127.4	1.804	0.185	1.6226	
15 minute winter	U3 7	24.001	U3 8	46.7	1.292	0.508	1.3194	
15 minute winter	U3 8	22.004	U3 POND	174.9	3.240	0.135	1.9056	
15 minute winter	U4 3	26.000	U4 5	36.5	1.329	0.329	0.2792	
15 minute summer	19 A	27.007	19	4.6	0.704	0.026	0.2415	
15 minute winter	28	3.007	28A	277.5	1.654	0.117	3.1018	
15 minute winter	U6 1	8.000	31	12.1	1.420	0.153	0.2026	
15 minute winter	U6 4	9.000	U6 6	11.5	1.254	0.171	0.2209	
15 minute winter	U6 5	10.000	U6 6	10.8	1.301	0.147	0.1688	
15 minute winter	U6 6	9.001	32	48.3	2.481	0.204	0.2187	
15 minute winter	U6 2	11.000	U6 3	21.1	1.446	0.313	0.2570	
15 minute winter	U6 3	11.001	34	24.9	1.802	0.301	0.4460	
15 minute winter	U5 1	5.000	U5 2	24.2	1.407	0.183	0.4861	
15 minute winter	U5 5	6.001	U5 6	92.1	1.270	0.190	2.0148	
15 minute winter	U5 7	4.003	U5 10	241.8	2.219	0.498	2.6014	
15 minute winter	U2 1	19.004	U2-16	122.7	1.883	0.380	3.4107	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U2 DOCK 1	10	205.873	0.073	15.9	0.3196	0.0000	OK
15 minute winter	U2 3	11	205.086	0.217	66.9	0.3634	0.0000	OK
15 minute winter	U2 5	10	205.566	0.066	12.3	0.1518	0.0000	OK
15 minute winter	U2 8	11	205.268	0.345	141.7	2.7069	0.0000	OK
15 minute winter	U2 9	11	205.246	0.390	261.7	3.7623	0.0000	OK
15 minute winter	U2 10	11	205.146	0.361	344.5	2.7011	0.0000	OK
15 minute winter	U2 20	11	205.116	0.156	43.5	0.4842	0.0000	OK
15 minute winter	U2 19	11	205.407	0.107	23.1	0.3536	0.0000	OK
240 minute winter	U2 18	192	203.586	0.409	34.9	0.7221	0.0000	OK
15 minute winter	U5 10	11	193.857	0.187	248.8	0.3941	0.0000	OK
15 minute winter	U1 4	11	208.503	0.303	231.9	1.7001	0.0000	OK
15 minute winter	U1 1	10	209.212	0.137	68.1	0.9676	0.0000	OK
15 minute winter	U1 2	10	208.810	0.253	122.5	1.3394	0.0000	OK
15 minute winter	U1 3	11	208.750	0.300	179.1	1.6017	0.0000	OK
15 minute winter	U1 10	10	208.773	0.123	32.5	0.4824	0.0000	OK
1440 minute winter	U1 11	1440	208.470	0.220	2.4	0.6266	0.0000	OK
15 minute summer	U5 8	1	195.300	0.000	0.0	0.0000	0.0000	OK
15 minute summer	U5 9	1	195.156	0.000	0.0	0.0000	0.0000	OK
360 minute winter	U2 14	288	204.828	0.453	14.8	1.1519	0.0000	SURCHARGED
360 minute winter	CP1	288	203.292	0.055	14.8	0.0627	0.0000	OK
360 minute winter	CP2	288	200.773	0.073	14.8	0.0826	0.0000	OK
360 minute winter	CP3	288	198.457	0.057	14.8	0.0641	0.0000	OK
360 minute winter	CP4	288	192.800	0.100	14.8	0.1129	0.0000	OK
360 minute winter	CP5	288	192.409	0.099	14.8	0.1115	0.0000	OK
360 minute winter	CP6	296	192.221	0.103	14.8	0.1160	0.0000	OK
15 minute winter	28A	12	192.203	0.431	277.5	1.0966	0.0000	OK
15 minute winter	U2-16	11	204.107	0.189	164.5	0.9123	0.0000	OK
240 minute winter	U2 POND 2	196	203.583	0.433	37.0	136.2674	0.0000	SURCHARGED
960 minute winter	19C	915	192.702	0.102	20.0	0.1152	0.0000	OK
960 minute winter	WEST OUTFALL	915	192.489	0.089	20.0	0.0000	0.0000	OK
600 minute winter	19B	570	194.066	0.616	20.1	2.1331	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U2 DOCK 1	21.000	U2 2	15.5	1.426	0.214	0.2323	
15 minute winter	U2 3	19.002	U2 2	65.6	1.094	0.594	1.8199	
15 minute winter	U2 5	19.000	U2 4	12.0	0.703	0.109	0.9458	
15 minute winter	U2 8	1.001	U2 9	139.4	0.669	0.254	7.1708	
15 minute winter	U2 9	1.002	U2 10	260.5	1.191	0.474	7.8114	
15 minute winter	U2 10	1.003	U2 POND 1	342.9	3.210	0.481	10.1192	
15 minute winter	U2 20	2.001	U2 14	43.4	1.037	0.340	1.3482	
15 minute winter	U2 19	2.000	U2 20	22.4	1.017	0.263	0.9898	
15 minute winter	U2 18	19.007	U2 POND 2	164.3	2.170	0.529	1.5687	
15 minute winter	U5 10	4.004	28	249.5	3.370	0.192	2.5739	
15 minute winter	U1 4	13.003	U1 5	233.1	1.431	0.328	13.4663	
15 minute winter	U1 1	13.000	U1 2	66.8	1.708	0.185	1.1517	
15 minute winter	U1 2	13.001	U1 3	120.3	0.960	0.304	4.0166	
15 minute winter	U1 3	13.002	U1 4	179.0	1.350	0.452	4.1639	
15 minute winter	U1 10	14.000	U1 11	31.7	1.044	0.350	1.8338	
15 minute winter	U1 11	14.001	U1 12	42.4	0.689	0.107	1.0477	
15 minute summer	U5 8	7.000	U5 9	0.0	0.000	0.000	0.0000	
15 minute summer	U5 9	7.001	U5 10	0.0	0.000	0.000	0.0000	
360 minute winter	U2 14	Hydro-Brake®	CP1	14.8				
360 minute winter	CP1	1.006	CP2	14.8	1.589	0.134	0.5307	
360 minute winter	CP2	1.007	CP3	14.8	1.568	0.210	1.1904	
360 minute winter	CP3	1.008	CP4	14.8	1.016	0.079	2.9876	
360 minute winter	CP4	1.009	CP5	14.8	0.763	0.232	1.2476	
360 minute winter	CP5	1.010	CP6	14.8	0.721	0.232	1.1807	
360 minute winter	CP6	1.011	28A	14.8	0.749	0.232	0.2737	
15 minute winter	28A	1.012	29	266.5	1.050	0.485	5.1809	
15 minute winter	U2-16	19.005	U2 17	163.2	1.765	0.212	4.5552	
240 minute winter	U2 POND 2	Hydro-Brake®	7	8.0				
960 minute winter	19C	13.021	WEST OUTFALL	20.0	1.693	0.660	0.0819	1135.4
960 minute winter	19B	Hydro-Brake®	19C	20.0				

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U3 1	10	202.518	0.217	63.5	0.7783	0.0000	OK
1440 minute winter	HIGHWAY POND SOUTH	1680	194.816	1.316	37.5	651.4716	0.0000	SURCHARGED
15 minute winter	5	11	205.190	0.190	88.4	0.3455	0.0000	OK
15 minute winter	8	11	201.811	0.167	194.2	0.3213	0.0000	OK
15 minute winter	13	11	198.652	0.653	69.9	0.9328	0.0000	SURCHARGED
15 minute winter	14	11	198.522	0.606	288.0	1.0997	0.0000	SURCHARGED
15 minute winter	15	11	198.146	0.307	299.4	0.4958	0.0000	OK
15 minute winter	17	12	196.009	0.709	351.4	2.1498	0.0000	SURCHARGED
15 minute winter	21	11	193.244	0.044	3.0	0.0554	0.0000	OK
15 minute winter	23	11	193.035	0.110	13.1	0.1773	0.0000	OK
15 minute winter	24	11	192.978	0.090	12.9	0.1292	0.0000	OK
15 minute winter	25	11	192.967	0.124	24.2	0.1977	0.0000	OK
15 minute winter	27	12	192.839	0.202	55.1	0.3256	0.0000	OK
15 minute winter	29	12	192.676	0.944	698.7	3.2140	0.0000	SURCHARGED
15 minute winter	U5 4	10	195.095	0.145	72.9	0.5798	0.0000	OK
15 minute winter	U5 6	10	194.651	0.327	404.2	2.0404	0.0000	OK
960 minute winter	33	945	192.589	0.589	0.6	0.8876	0.0000	SURCHARGED
960 minute winter	34	945	192.589	1.346	73.9	3.6950	0.0000	SURCHARGED
960 minute winter	HIGHWAY POND EAST	945	192.589	1.589	76.8	1114.3210	0.0000	SURCHARGED
15 minute summer	EAST OUTFAL	70	190.075	0.075	24.9	0.0000	0.0000	OK
15 minute winter	7	11	202.336	0.224	181.1	0.4073	0.0000	OK
15 minute winter	12	11	198.814	0.542	53.4	0.8341	0.0000	SURCHARGED
15 minute winter	U3 5	11	201.984	0.309	63.3	1.1436	0.0000	SURCHARGED
15 minute winter	26	11	192.940	0.161	44.3	0.2922	0.0000	OK
960 minute winter	30	945	192.589	0.930	64.7	2.6366	0.0000	SURCHARGED
960 minute winter	31	945	192.589	1.069	65.0	2.9019	0.0000	SURCHARGED
960 minute winter	32	945	192.589	1.297	69.7	3.5387	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U3 1	22.000	U3 2	61.8	1.044	0.789	2.0526	
15 minute summer	HIGHWAY POND SOUTH	13.019	19B	23.0	0.741	0.627	0.3977	
15 minute winter	5	13.009	6	87.6	1.968	0.645	1.1937	
15 minute winter	8	13.012	14	193.8	3.813	0.260	1.4851	
15 minute winter	13	22.010	14	70.4	1.000	1.104	1.7491	
15 minute winter	14	13.013	15	286.0	1.918	1.780	4.2090	
15 minute winter	15	13.014	16	299.1	3.493	0.410	2.8691	
15 minute winter	17	13.016	19	350.9	2.217	2.184	2.9265	
15 minute winter	21	3.000	22	2.9	0.480	0.045	0.1165	
15 minute winter	23	Orifice	24	12.9				
15 minute winter	24	3.003	25	12.9	0.448	0.073	0.4322	
15 minute winter	25	3.004	26	24.0	0.558	0.149	1.0995	
15 minute winter	27	3.006	28	53.7	0.931	0.334	1.3659	
15 minute winter	29	1.013	30	697.0	1.584	1.268	16.0820	
15 minute winter	U5 4	6.000	U5 5	72.1	1.527	0.212	1.5654	
15 minute winter	U5 6	6.002	U5 7	402.3	1.868	0.465	7.1514	
15 minute winter	33	12.000	34	9.5	0.976	0.186	0.2336	
15 minute winter	34	1.017	HIGHWAY POND EAST	919.0	3.926	0.831	12.1792	
15 minute summer	HIGHWAY POND EAST	Hydro-Brake®	35	24.9				
15 minute winter	7	13.011	8	181.0	2.737	0.411	1.6726	
15 minute winter	12	22.009	13	51.8	0.751	0.811	5.7740	
15 minute winter	U3 5	23.000	U3 6	61.1	1.537	1.175	0.4535	
15 minute winter	26	3.005	27	44.3	0.781	0.276	3.3346	
15 minute winter	30	1.014	31	714.9	1.633	1.300	29.7077	
15 minute winter	31	1.015	32	748.6	1.730	0.794	16.8734	
15 minute winter	32	1.016	34	853.9	2.169	1.553	9.4693	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	16	12	196.589	0.289	313.0	0.5596	0.0000	OK
15 minute winter	22	11	193.101	0.040	2.9	0.0571	0.0000	OK
15 minute winter	19	12	195.510	0.407	363.2	0.8467	0.0000	OK
15 minute winter	20	11	195.224	0.171	371.5	0.3470	0.0000	OK
15 minute winter	35	16	190.891	0.077	24.9	0.0871	0.0000	OK
480 minute winter	U2 POND 1	464	205.261	0.761	109.4	973.4343	0.0000	SURCHARGED
360 minute winter	U2 17	352	204.080	0.777	59.7	1.3727	0.0000	SURCHARGED
1440 minute winter	U 1 POND	1440	208.971	1.121	44.8	1432.0190	0.0000	SURCHARGED
15 minute winter	3	11	206.707	0.207	56.8	0.3997	0.0000	OK
15 minute winter	U1 7	11	209.084	0.284	39.7	0.7549	0.0000	SURCHARGED
15 minute winter	U2 4	12	205.692	0.703	149.3	2.6325	0.0000	SURCHARGED
15 minute winter	U2 DOCK 2	11	205.937	0.137	49.5	0.7165	0.0000	OK
15 minute winter	U2 2	11	205.252	0.551	240.1	1.6513	0.0000	SURCHARGED
15 minute winter	U2 7	11	205.606	0.618	136.7	3.4411	0.0000	OK
960 minute winter	U4 2	945	200.235	0.235	1.6	0.4619	0.0000	SURCHARGED
960 minute winter	U4 5	945	200.235	0.995	12.8	1.4241	0.0000	SURCHARGED
960 minute winter	U3 POND	945	200.235	1.235	39.7	707.8963	0.0000	SURCHARGED
15 minute winter	U4 9	11	198.798	0.347	296.2	1.3312	0.0000	OK
15 minute winter	U4 10	10	199.827	0.127	102.6	0.6267	0.0000	OK
15 minute winter	U4 11	11	198.507	0.229	558.0	1.1473	0.0000	OK
720 minute winter	U 4 POND	705	198.157	1.657	52.5	714.3699	0.0000	SURCHARGED
15 minute winter	U4 1	10	200.062	0.162	81.6	0.7429	0.0000	OK
15 minute winter	U4 8	12	199.112	0.403	201.7	0.5771	0.0000	OK
15 minute winter	U3 DOCK	12	202.136	0.186	21.4	0.4983	0.0000	SURCHARGED
15 minute winter	U4 DOCK	12	200.247	0.797	102.8	6.8239	0.0000	FLOOD RISK
15 minute winter	U4 6	11	199.474	0.338	161.7	0.4844	0.0000	OK
15 minute summer	U5 DOCK	1	194.600	0.000	0.0	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	16	13.015	17	309.6	2.112	0.596	5.1825	
15 minute winter	22	3.001	23	2.9	0.461	0.016	0.1144	
15 minute winter	19	13.017	20	364.9	2.722	1.066	2.7077	
15 minute winter	20	13.018	HIGHWAY POND SOUTH	372.1	5.000	0.183	2.6579	
15 minute summer	35	1.019	EAST OUTFAL	24.9	1.783	0.138	0.4327	365.4
15 minute winter	U2 POND 1	1.004	U2 14	-91.4	-0.935	-0.920	5.5149	
15 minute winter	U2 17	19.006	U2 18	394.7	1.692	0.573	2.9734	
1440 minute winter	U 1 POND	Hydro-Brake®	2	2.0				
15 minute winter	3	13.007	4	53.7	1.480	1.039	2.2552	
15 minute winter	U1 7	16.000	U1 8	38.3	0.963	1.014	1.0702	
15 minute winter	U2 4	19.001	U2 3	141.5	1.283	1.278	4.2785	
15 minute winter	U2 DOCK 2	20.000	U2 4	47.0	1.995	0.542	0.6885	
15 minute winter	U2 2	19.003	U2 1	240.8	1.548	1.514	6.6699	
15 minute winter	U2 7	1.000	U2 8	131.3	0.425	0.239	13.1278	
15 minute winter	U4 2	25.000	U4 5	24.1	1.689	0.310	0.3369	
15 minute winter	U4 5	25.001	U3 POND	113.5	1.720	0.452	5.8305	
15 minute summer	U3 POND	22.005	9	3.8	0.669	0.103	0.1913	
15 minute winter	U4 9	27.004	U4 11	295.3	2.247	0.608	4.6369	
15 minute winter	U4 10	29.000	U4 11	101.4	2.861	0.162	1.2042	
15 minute winter	U4 11	27.005	U 4 POND	558.9	4.189	0.322	5.3409	
720 minute winter	U 4 POND	Hydro-Brake®	19 A	5.0				
15 minute winter	U4 1	27.000	U4 6	79.9	1.127	0.399	5.7110	
15 minute winter	U4 8	27.003	U4 9	201.5	1.482	1.085	4.3624	
15 minute winter	U3 DOCK	24.000	U3 7	19.0	1.126	0.811	0.6576	
15 minute winter	U4 DOCK	28.000	U4 6	84.2	2.117	1.620	0.9560	
15 minute winter	U4 6	27.001	U4 7	157.8	1.612	0.967	3.0988	
15 minute summer	U5 DOCK	4.000	U5 2	0.0	0.000	0.000	0.1966	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U5 2	10	194.515	0.263	134.6	0.9329	0.0000	OK
15 minute winter	1	10	208.644	0.094	22.3	0.1968	0.0000	OK
15 minute winter	9	13	199.018	0.122	10.2	0.1379	0.0000	OK
15 minute winter	10	13	199.006	0.312	31.2	0.4751	0.0000	SURCHARGED
15 minute winter	11	12	198.935	0.437	40.6	0.5666	0.0000	SURCHARGED
15 minute winter	U4 7	11	199.244	0.388	204.2	1.0764	0.0000	OK
15 minute winter	U5 3	11	194.354	0.402	175.8	1.1491	0.0000	OK
1440 minute winter	U1 5	1440	208.971	1.046	25.7	2.6622	0.0000	SURCHARGED
1440 minute winter	U1 6	1440	208.971	0.171	0.2	0.2447	0.0000	OK
1440 minute winter	U1 DOCK	1440	208.971	0.171	0.0	0.1933	0.0000	SURCHARGED
1440 minute winter	U1 8	1440	208.971	0.314	7.2	1.7510	0.0000	OK
1440 minute winter	U1 9	1440	208.971	0.521	7.3	0.7457	0.0000	SURCHARGED
1440 minute winter	U1 12	1440	208.971	0.778	6.9	2.6882	0.0000	SURCHARGED
1440 minute winter	U1 13	1440	208.971	0.825	6.5	1.4579	0.0000	SURCHARGED
1440 minute winter	U1 14	1440	208.971	0.880	6.2	1.5551	0.0000	SURCHARGED
15 minute winter	2	10	207.408	0.108	36.4	0.1746	0.0000	OK
15 minute winter	4	11	205.984	0.159	71.4	0.2896	0.0000	OK
15 minute winter	6	11	204.630	0.180	158.5	0.7332	0.0000	OK
15 minute winter	U3 2	10	202.395	0.340	174.1	1.7549	0.0000	OK
15 minute winter	U3 3	10	202.123	0.224	231.7	0.7437	0.0000	OK
15 minute winter	U3 6	11	201.761	0.203	78.3	0.3493	0.0000	OK
15 minute winter	U3 4	11	201.371	0.317	309.3	0.5605	0.0000	OK
15 minute winter	U3 7	11	201.707	0.406	115.7	1.8365	0.0000	SURCHARGED
15 minute winter	U3 8	11	200.993	0.243	421.5	0.4289	0.0000	OK
960 minute winter	U4 3	945	200.235	0.735	7.8	3.2480	0.0000	SURCHARGED
720 minute winter	19 A	705	196.451	0.026	5.0	0.0292	0.0000	OK
15 minute winter	28	12	192.816	0.375	685.0	1.0669	0.0000	OK
15 minute winter	U6 1	10	193.275	0.100	30.1	0.2357	0.0000	OK
15 minute winter	U6 4	10	193.282	0.107	28.9	0.2473	0.0000	OK
15 minute winter	U6 5	10	193.273	0.098	26.9	0.2170	0.0000	OK
15 minute winter	U6 6	10	192.873	0.177	119.9	0.5489	0.0000	OK
15 minute winter	U6 2	10	193.038	0.163	52.4	0.5311	0.0000	OK
15 minute winter	U6 3	10	192.732	0.153	62.3	0.2268	0.0000	OK
15 minute winter	U5 1	10	194.950	0.150	60.8	0.5214	0.0000	OK
15 minute winter	U5 5	10	194.790	0.328	230.1	1.9840	0.0000	OK
15 minute winter	U5 7	11	194.332	0.544	586.6	1.1539	0.0000	OK
15 minute winter	U2 1	11	204.951	0.361	290.9	0.9764	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U5 2	4.001	U5 3	131.4	1.443	0.576	2.8147	
15 minute winter	1	18.000	2	22.0	1.741	0.718	0.5354	
15 minute winter	9	22.006	10	9.8	0.592	0.267	1.2448	
15 minute winter	10	22.007	11	30.3	0.883	0.829	1.5567	
15 minute winter	11	22.008	12	36.9	0.968	1.008	1.5140	
15 minute winter	U4 7	27.002	U4 8	201.7	1.448	0.885	3.0679	
15 minute winter	U5 3	4.002	U5 7	175.6	0.777	0.361	7.6838	
15 minute winter	U1 5	13.004	U 1 POND	566.6	2.864	0.889	7.3064	
15 minute summer	U1 6	15.000	U1 8	-9.3	-0.210	-0.050	2.5033	
15 minute summer	U1 DOCK	17.000	U1 8	-2.5	-0.204	-0.170	0.3376	
15 minute winter	U1 8	15.001	U1 9	152.8	2.076	0.540	1.9881	
15 minute winter	U1 9	15.002	U 1 POND	154.1	3.152	0.313	2.3830	
15 minute winter	U1 12	14.002	U1 13	155.2	1.195	0.392	1.8149	
15 minute winter	U1 13	14.003	U1 14	155.5	1.499	0.454	2.2843	
15 minute winter	U1 14	14.004	U 1 POND	154.2	2.176	0.228	4.1705	
15 minute winter	2	13.006	3	35.9	1.322	0.469	1.0546	
15 minute winter	4	13.008	5	71.5	1.685	0.552	2.5761	
15 minute winter	6	13.010	7	158.4	2.744	0.324	4.1798	
15 minute winter	U3 2	22.001	U3 3	170.6	1.929	1.108	2.2775	
15 minute winter	U3 3	22.002	U3 4	230.8	3.175	0.409	1.6339	
15 minute winter	U3 6	23.001	U3 4	78.4	1.634	0.706	0.9780	
15 minute winter	U3 4	22.003	U3 8	311.1	2.243	0.452	3.1873	
15 minute winter	U3 7	24.001	U3 8	110.4	1.577	1.200	2.4526	
15 minute winter	U3 8	22.004	U3 POND	422.8	4.100	0.326	3.6404	
15 minute winter	U4 3	26.000	U4 5	89.7	1.627	0.807	0.5581	
720 minute winter	19 A	27.007	19	5.0	0.603	0.028	0.1696	
15 minute winter	28	3.007	28A	665.2	1.892	0.279	5.9738	
15 minute winter	U6 1	8.000	31	29.6	1.799	0.375	0.3926	
15 minute winter	U6 4	9.000	U6 6	28.6	1.580	0.423	0.4344	
15 minute winter	U6 5	10.000	U6 6	26.7	1.581	0.363	0.3470	
15 minute winter	U6 6	9.001	32	118.6	3.032	0.501	0.4385	
15 minute winter	U6 2	11.000	U6 3	51.8	1.739	0.766	0.5229	
15 minute winter	U6 3	11.001	34	61.1	2.222	0.739	0.8894	
15 minute winter	U5 1	5.000	U5 2	59.7	1.771	0.452	0.9516	
15 minute winter	U5 5	6.001	U5 6	227.9	1.480	0.469	4.3223	
15 minute winter	U5 7	4.003	U5 10	592.8	2.762	1.220	4.9708	
15 minute winter	U2 1	19.004	U2-16	289.7	2.251	0.896	6.7557	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U2 DOCK 1	10	205.924	0.124	39.1	0.5410	0.0000	OK
15 minute winter	U2 3	11	205.458	0.589	148.6	0.9878	0.0000	SURCHARGED
15 minute winter	U2 5	11	205.732	0.232	30.2	0.5314	0.0000	OK
15 minute winter	U2 8	11	205.600	0.677	353.0	5.3188	0.0000	OK
15 minute winter	U2 9	11	205.562	0.706	652.3	6.8187	0.0000	OK
15 minute winter	U2 10	11	205.386	0.601	860.4	4.4941	0.0000	OK
480 minute winter	U2 20	464	205.258	0.298	12.0	0.9255	0.0000	OK
15 minute winter	U2 19	10	205.484	0.184	56.7	0.6113	0.0000	OK
360 minute winter	U2 18	352	204.080	0.903	57.7	1.5954	0.0000	SURCHARGED
15 minute winter	U5 10	11	193.985	0.316	609.9	0.6643	0.0000	OK
1440 minute winter	U1 4	1440	208.971	0.771	27.1	4.3264	0.0000	SURCHARGED
15 minute winter	U1 1	10	209.313	0.238	167.3	1.6741	0.0000	OK
15 minute winter	U1 2	11	209.069	0.512	303.5	2.7109	0.0000	OK
15 minute winter	U1 3	11	208.997	0.547	434.8	2.9228	0.0000	OK
1440 minute winter	U1 10	1440	208.971	0.321	3.7	1.2604	0.0000	SURCHARGED
1440 minute winter	U1 11	1440	208.971	0.721	4.9	2.0521	0.0000	SURCHARGED
15 minute summer	U5 8	1	195.300	0.000	0.0	0.0000	0.0000	OK
15 minute summer	U5 9	1	195.156	0.000	0.0	0.0000	0.0000	OK
480 minute winter	U2 14	464	205.258	0.883	15.5	2.2477	0.0000	SURCHARGED
30 minute summer	CP1	33	203.293	0.056	15.0	0.0631	0.0000	OK
60 minute winter	CP2	39	200.774	0.073	15.0	0.0831	0.0000	OK
30 minute summer	CP3	42	198.457	0.057	15.0	0.0644	0.0000	OK
15 minute winter	CP4	13	192.813	0.113	17.6	0.1274	0.0000	OK
15 minute winter	CP5	12	192.849	0.539	37.7	0.6095	0.0000	SURCHARGED
15 minute winter	CP6	12	192.798	0.680	47.2	0.7695	0.0000	SURCHARGED
15 minute winter	28A	12	192.783	1.010	665.2	2.5716	0.0000	SURCHARGED
15 minute winter	U2-16	11	204.248	0.331	398.0	1.5941	0.0000	OK
360 minute winter	U2 POND 2	352	204.080	0.930	60.9	397.3069	0.0000	SURCHARGED
15 minute winter	19C	94	192.702	0.102	20.0	0.1152	0.0000	OK
15 minute winter	WEST OUTFALL	94	192.489	0.089	20.0	0.0000	0.0000	OK
1440 minute winter	19B	1680	194.803	1.353	20.1	4.6881	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U2 DOCK 1	21.000	U2 2	38.4	1.786	0.529	0.4579	
15 minute winter	U2 3	19.002	U2 2	150.2	1.362	1.359	3.3269	
15 minute winter	U2 5	19.000	U2 4	36.8	0.699	0.333	2.8318	
15 minute winter	U2 8	1.001	U2 9	352.3	0.834	0.641	14.1974	
15 minute winter	U2 9	1.002	U2 10	654.3	1.607	1.190	14.3213	
15 minute winter	U2 10	1.003	U2 POND 1	863.7	3.741	1.211	21.1074	
15 minute winter	U2 20	2.001	U2 14	107.2	1.320	0.839	2.6079	
15 minute winter	U2 19	2.000	U2 20	55.7	1.180	0.655	2.1296	
15 minute summer	U2 18	19.007	U2 POND 2	398.0	2.442	1.281	3.3015	
15 minute winter	U5 10	4.004	28	614.0	4.019	0.473	5.6263	
15 minute winter	U1 4	13.003	U1 5	568.1	1.790	0.799	26.2157	
15 minute winter	U1 1	13.000	U1 2	166.6	1.793	0.461	3.1957	
15 minute winter	U1 2	13.001	U1 3	294.0	1.122	0.743	8.3589	
15 minute winter	U1 3	13.002	U1 4	436.2	1.770	1.102	7.6508	
15 minute winter	U1 10	14.000	U1 11	77.9	1.290	0.860	3.5980	
15 minute winter	U1 11	14.001	U1 12	104.4	0.815	0.264	2.1749	
15 minute summer	U5 8	7.000	U5 9	0.0	0.000	0.000	0.0000	
15 minute summer	U5 9	7.001	U5 10	0.0	0.000	0.000	0.0000	
30 minute summer	U2 14	Hydro-Brake®	CP1	15.0				
30 minute summer	CP1	1.006	CP2	15.0	1.595	0.135	0.5349	
30 minute summer	CP2	1.007	CP3	15.0	1.573	0.212	1.1997	
30 minute summer	CP3	1.008	CP4	15.0	1.592	0.080	3.0114	
15 minute winter	CP4	1.009	CP5	19.2	0.798	0.300	2.8116	
15 minute winter	CP5	1.010	CP6	47.2	0.725	0.740	4.0449	
15 minute winter	CP6	1.011	28A	53.6	0.850	0.840	0.9735	
15 minute winter	28A	1.012	29	634.9	1.443	1.155	8.8539	
15 minute winter	U2-16	19.005	U2 17	397.1	2.036	0.516	9.5242	
15 minute summer	U2 POND 2	Hydro-Brake®	7	8.0				
15 minute winter	19C	13.021	WEST OUTFALL	20.0	1.693	0.660	0.0819	294.8
15 minute winter	19B	Hydro-Brake®	19C	20.0				

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U3 1	11	202.829	0.529	82.3	1.8924	0.0000	SURCHARGED
1440 minute winter	HIGHWAY POND SOUTH	1680	195.017	1.517	42.9	817.9993	0.0000	SURCHARGED
15 minute winter	5	11	205.219	0.219	107.3	0.3988	0.0000	OK
15 minute winter	8	11	201.835	0.191	243.3	0.3673	0.0000	OK
15 minute winter	13	11	198.892	0.893	83.4	1.2755	0.0000	SURCHARGED
15 minute winter	14	11	198.717	0.801	357.1	1.4550	0.0000	SURCHARGED
15 minute winter	15	11	198.172	0.333	375.2	0.5376	0.0000	OK
15 minute winter	17	12	196.214	0.914	433.5	2.7717	0.0000	SURCHARGED
15 minute winter	21	10	193.251	0.051	3.9	0.0633	0.0000	OK
15 minute winter	23	14	193.207	0.282	17.2	0.4537	0.0000	OK
15 minute winter	24	12	193.469	0.581	23.9	0.8311	0.0000	SURCHARGED
15 minute winter	25	12	193.479	0.636	46.3	1.0149	0.0000	SURCHARGED
15 minute winter	27	13	193.302	0.665	106.2	1.0723	0.0000	SURCHARGED
15 minute winter	29	13	193.056	1.324	788.5	4.5076	0.0000	SURCHARGED
15 minute winter	U5 4	10	195.120	0.170	94.7	0.6783	0.0000	OK
15 minute winter	U5 6	11	194.755	0.431	520.8	2.6902	0.0000	OK
960 minute winter	33	945	192.930	0.930	0.8	1.4025	0.0000	SURCHARGED
960 minute winter	34	945	192.930	1.687	91.9	4.6325	0.0000	SURCHARGED
960 minute winter	HIGHWAY POND EAST	945	192.930	1.930	95.9	1483.7420	0.0000	SURCHARGED
15 minute winter	EAST OUTFAL	14	190.075	0.075	24.9	0.0000	0.0000	OK
15 minute winter	7	11	202.370	0.258	226.1	0.4680	0.0000	OK
15 minute winter	12	12	199.147	0.875	60.4	1.3467	0.0000	SURCHARGED
15 minute winter	U3 5	11	202.190	0.515	82.0	1.9048	0.0000	SURCHARGED
15 minute winter	26	12	193.305	0.526	106.7	0.9552	0.0000	SURCHARGED
960 minute winter	30	945	192.930	1.271	76.7	3.6044	0.0000	SURCHARGED
960 minute winter	31	945	192.930	1.410	77.0	3.8288	0.0000	SURCHARGED
960 minute winter	32	945	192.930	1.638	85.5	4.4704	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U3 1	22.000	U3 2	79.2	1.124	1.011	2.3966	
15 minute winter	HIGHWAY POND SOUTH	13.019	19B	24.4	0.775	0.667	0.3977	
15 minute winter	5	13.009	6	106.1	2.043	0.781	1.3946	
15 minute winter	8	13.012	14	243.6	4.033	0.327	1.7653	
15 minute winter	13	22.010	14	84.3	1.197	1.322	1.7491	
15 minute winter	14	13.013	15	358.0	2.347	2.228	4.3709	
15 minute winter	15	13.014	16	370.3	3.467	0.507	3.8821	
15 minute winter	17	13.016	19	435.4	2.748	2.710	2.9756	
15 minute winter	21	3.000	22	3.8	0.520	0.059	0.2334	
15 minute winter	23	Orifice	24	23.9				
15 minute winter	24	3.003	25	35.6	0.456	0.202	2.3591	
15 minute summer	25	3.004	26	-70.8	0.617	-0.440	4.0001	
15 minute summer	27	3.006	28	148.4	1.244	0.924	2.9201	
15 minute winter	29	1.013	30	795.6	1.808	1.447	16.0820	
15 minute winter	U5 4	6.000	U5 5	93.6	1.570	0.275	2.1620	
15 minute winter	U5 6	6.002	U5 7	502.2	1.949	0.580	8.4690	
15 minute winter	33	12.000	34	12.4	1.046	0.242	0.4780	
15 minute winter	34	1.017	HIGHWAY POND EAST	1058.2	4.017	0.956	13.3298	
180 minute summer	HIGHWAY POND EAST	Hydro-Brake®	35	24.9				
15 minute winter	7	13.011	8	226.2	2.865	0.513	1.9944	
15 minute winter	12	22.009	13	62.3	0.885	0.977	5.7740	
15 minute winter	U3 5	23.000	U3 6	78.8	1.982	1.516	0.4652	
15 minute winter	26	3.005	27	102.2	0.921	0.636	9.0205	
15 minute winter	30	1.014	31	813.5	1.849	1.480	30.2794	
15 minute winter	31	1.015	32	849.2	1.930	0.901	17.2136	
15 minute winter	32	1.016	34	978.0	2.265	1.779	10.6310	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	16	12	196.927	0.627	388.4	1.2132	0.0000	SURCHARGED
15 minute winter	22	14	193.232	0.171	3.8	0.2449	0.0000	OK
15 minute winter	19	12	195.567	0.463	449.7	0.9635	0.0000	OK
15 minute summer	20	11	195.244	0.191	442.6	0.3883	0.0000	OK
15 minute winter	35	14	190.891	0.077	24.9	0.0871	0.0000	OK
480 minute winter	U2 POND 1	472	205.484	0.984	134.9	1344.7170	0.0000	SURCHARGED
360 minute winter	U2 17	360	204.298	0.995	77.3	1.7585	0.0000	SURCHARGED
1440 minute winter	U 1 POND	1440	209.204	1.354	58.0	1864.9160	0.0000	SURCHARGED
15 minute winter	3	12	207.055	0.554	73.2	1.0729	0.0000	SURCHARGED
15 minute winter	U1 7	11	209.248	0.448	51.5	1.1931	0.0000	SURCHARGED
15 minute winter	U2 4	12	206.258	1.269	179.2	4.7484	0.0000	SURCHARGED
15 minute winter	U2 DOCK 2	12	206.500	0.700	64.1	3.6512	0.0790	FLOOD
15 minute winter	U2 2	11	205.611	0.910	292.5	2.7242	0.0000	SURCHARGED
15 minute winter	U2 7	11	205.996	1.008	177.4	5.6188	0.0000	SURCHARGED
1440 minute winter	U4 2	1410	200.512	0.512	1.4	1.0048	0.0000	SURCHARGED
1440 minute winter	U4 5	1410	200.512	1.272	6.6	1.8196	0.0000	SURCHARGED
1440 minute winter	U3 POND	1410	200.512	1.512	35.7	944.8509	0.0000	SURCHARGED
15 minute winter	U4 9	11	198.844	0.393	362.3	1.5062	0.0000	OK
15 minute winter	U4 10	10	199.847	0.147	133.1	0.7230	0.0000	OK
15 minute winter	U4 11	11	198.539	0.261	708.9	1.3093	0.0000	OK
960 minute winter	U 4 POND	945	198.478	1.978	53.6	960.4360	0.0000	SURCHARGED
15 minute winter	U4 1	10	200.089	0.189	106.0	0.8641	0.0000	OK
15 minute winter	U4 8	11	199.187	0.478	234.3	0.6841	0.0000	SURCHARGED
15 minute winter	U3 DOCK	12	202.607	0.657	27.7	1.7556	0.0000	FLOOD RISK
15 minute winter	U4 DOCK	10	200.250	0.800	133.4	6.8512	8.1451	FLOOD
15 minute winter	U4 6	11	199.656	0.521	182.4	0.7459	0.0000	SURCHARGED
15 minute winter	U5 DOCK	12	194.706	0.106	5.8	0.1203	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	16	13.015	17	385.8	2.435	0.743	6.1722	
15 minute winter	22	3.001	23	10.2	0.439	0.055	1.1480	
15 minute winter	19	13.017	20	451.2	2.879	1.318	3.1179	
15 minute winter	20	13.018	HIGHWAY POND SOUTH	460.3	5.124	0.226	2.9850	
15 minute winter	35	1.019	EAST OUTFAL	24.9	1.783	0.138	0.4327	363.7
15 minute winter	U2 POND 1	1.004	U2 14	-121.4	-1.162	-1.222	5.5149	
15 minute winter	U2 17	19.006	U2 18	487.3	1.968	0.708	3.4416	
1440 minute winter	U 1 POND	Hydro-Brake®	2	2.2				
15 minute winter	3	13.007	4	64.2	1.616	1.244	2.3595	
15 minute winter	U1 7	16.000	U1 8	49.8	1.251	1.318	1.0702	
15 minute winter	U2 4	19.001	U2 3	167.1	1.515	1.510	4.2785	
15 minute winter	U2 DOCK 2	20.000	U2 4	58.8	1.964	0.678	0.8405	
15 minute winter	U2 2	19.003	U2 1	288.7	1.822	1.815	7.1746	
15 minute winter	U2 7	1.000	U2 8	170.8	0.428	0.311	14.3312	
15 minute winter	U4 2	25.000	U4 5	31.3	1.803	0.403	0.5304	
15 minute winter	U4 5	25.001	U3 POND	145.0	1.777	0.578	6.2886	
15 minute winter	U3 POND	22.005	9	-18.3	0.683	-0.501	0.8282	
15 minute winter	U4 9	27.004	U4 11	363.1	2.318	0.747	5.4258	
15 minute winter	U4 10	29.000	U4 11	131.7	3.063	0.210	1.4602	
15 minute winter	U4 11	27.005	U 4 POND	703.8	4.370	0.406	5.6241	
960 minute winter	U 4 POND	Hydro-Brake®	19 A	5.4				
15 minute winter	U4 1	27.000	U4 6	104.0	1.171	0.519	6.3251	
15 minute winter	U4 8	27.003	U4 9	233.5	1.542	1.257	4.6570	
15 minute winter	U3 DOCK	24.000	U3 7	23.9	1.360	1.019	0.6576	
30 minute winter	U4 DOCK	28.000	U4 6	83.7	2.105	1.611	0.9560	
15 minute winter	U4 6	27.001	U4 7	173.7	1.605	1.065	3.3685	
15 minute winter	U5 DOCK	4.000	U5 2	-5.8	-0.408	-0.398	0.4590	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U5 2	11	194.715	0.463	175.5	1.6426	0.0000	SURCHARGED
15 minute winter	1	10	208.668	0.118	29.0	0.2452	0.0000	OK
15 minute winter	9	13	199.477	0.581	20.5	0.6575	0.0000	SURCHARGED
15 minute winter	10	12	199.458	0.764	37.2	1.1652	0.0000	SURCHARGED
15 minute winter	11	12	199.354	0.856	45.7	1.1096	0.0000	SURCHARGED
15 minute winter	U4 7	11	199.356	0.500	234.7	1.3878	0.0000	SURCHARGED
15 minute winter	U5 3	11	194.605	0.653	218.4	1.8672	0.0000	SURCHARGED
1440 minute winter	U1 5	1440	209.204	1.279	31.9	3.2553	0.0000	SURCHARGED
1440 minute winter	U1 6	1440	209.204	0.404	0.3	0.5783	0.0000	OK
1440 minute winter	U1 DOCK	1440	209.204	0.404	0.1	0.4570	0.0000	SURCHARGED
1440 minute winter	U1 8	1440	209.204	0.547	9.2	3.0500	0.0000	SURCHARGED
1440 minute winter	U1 9	1440	209.204	0.754	9.2	1.0791	0.0000	SURCHARGED
1440 minute winter	U1 12	1440	209.204	1.011	8.9	3.4933	0.0000	SURCHARGED
1440 minute winter	U1 13	1440	209.204	1.058	8.5	1.8697	0.0000	SURCHARGED
1440 minute winter	U1 14	1440	209.204	1.113	8.2	1.9668	0.0000	SURCHARGED
15 minute winter	2	11	207.429	0.129	46.8	0.2095	0.0000	OK
15 minute winter	4	11	206.004	0.179	85.9	0.3255	0.0000	OK
15 minute winter	6	11	204.655	0.205	198.1	0.8349	0.0000	OK
15 minute winter	U3 2	11	202.616	0.561	221.0	2.8945	0.0000	SURCHARGED
15 minute winter	U3 3	11	202.163	0.264	294.4	0.8759	0.0000	OK
15 minute winter	U3 6	11	201.809	0.251	100.4	0.4317	0.0000	OK
15 minute winter	U3 4	11	201.427	0.373	396.7	0.6585	0.0000	OK
15 minute winter	U3 7	11	201.987	0.687	143.4	3.1055	0.0000	SURCHARGED
15 minute winter	U3 8	11	201.029	0.279	536.3	0.4938	0.0000	OK
1440 minute winter	U4 3	1410	200.512	1.012	5.3	4.4692	0.0000	SURCHARGED
960 minute winter	19 A	945	196.452	0.027	5.4	0.0304	0.0000	OK
15 minute winter	28	13	193.321	0.880	785.2	2.5022	0.0000	SURCHARGED
15 minute winter	U6 1	10	193.292	0.117	39.1	0.2762	0.0000	OK
15 minute winter	U6 4	10	193.299	0.124	37.5	0.2857	0.0000	OK
15 minute winter	U6 5	10	193.287	0.112	34.9	0.2497	0.0000	OK
960 minute winter	U6 6	945	192.930	0.234	9.8	0.7246	0.0000	OK
15 minute winter	U6 2	11	193.112	0.236	68.0	0.7707	0.0000	SURCHARGED
960 minute winter	U6 3	945	192.930	0.351	5.2	0.5209	0.0000	SURCHARGED
15 minute winter	U5 1	10	194.977	0.177	78.8	0.6141	0.0000	OK
15 minute winter	U5 5	11	194.859	0.398	298.6	2.4020	0.0000	OK
15 minute winter	U5 7	11	194.560	0.772	737.9	1.6391	0.0000	SURCHARGED
15 minute winter	U2 1	11	205.162	0.572	349.8	1.5481	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U5 2	4.001	U5 3	164.2	1.380	0.720	4.7665	
15 minute winter	1	18.000	2	28.4	1.863	0.929	0.6481	
15 minute summer	9	22.006	10	20.9	0.589	0.571	1.6042	
15 minute winter	10	22.007	11	33.9	0.886	0.926	1.5567	
15 minute winter	11	22.008	12	41.3	1.083	1.129	1.5140	
15 minute winter	U4 7	27.002	U4 8	234.3	1.479	1.028	3.4324	
15 minute winter	U5 3	4.002	U5 7	216.1	0.829	0.445	9.2289	
15 minute winter	U1 5	13.004	U 1 POND	727.8	3.160	1.142	9.4185	
15 minute summer	U1 6	15.000	U1 8	-11.5	-0.244	-0.062	3.3080	
15 minute summer	U1 DOCK	17.000	U1 8	-3.1	-0.214	-0.214	0.3775	
15 minute winter	U1 8	15.001	U1 9	197.1	2.194	0.697	2.4190	
15 minute winter	U1 9	15.002	U 1 POND	197.7	3.244	0.402	2.7556	
15 minute winter	U1 12	14.002	U1 13	195.8	1.266	0.495	2.1641	
15 minute winter	U1 13	14.003	U1 14	195.1	1.591	0.570	3.1710	
15 minute winter	U1 14	14.004	U 1 POND	194.0	2.243	0.287	5.4606	
15 minute winter	2	13.006	3	46.2	1.360	0.603	1.1762	
15 minute winter	4	13.008	5	85.5	1.732	0.659	3.0006	
15 minute winter	6	13.010	7	198.6	2.907	0.406	4.9485	
15 minute winter	U3 2	22.001	U3 3	218.7	2.088	1.419	2.5311	
15 minute winter	U3 3	22.002	U3 4	295.7	3.343	0.524	1.9867	
15 minute winter	U3 6	23.001	U3 4	101.0	1.700	0.909	1.2082	
15 minute winter	U3 4	22.003	U3 8	397.9	2.369	0.578	3.8574	
15 minute winter	U3 7	24.001	U3 8	138.4	1.966	1.504	2.5241	
15 minute winter	U3 8	22.004	U3 POND	537.1	4.348	0.414	4.3608	
15 minute winter	U4 3	26.000	U4 5	113.6	1.684	1.022	0.6856	
960 minute winter	19 A	27.007	19	5.4	0.633	0.030	0.1717	
15 minute winter	28	3.007	28A	765.5	1.913	0.321	7.9635	
15 minute winter	U6 1	8.000	31	38.5	1.915	0.488	0.4792	
15 minute winter	U6 4	9.000	U6 6	37.1	1.578	0.549	0.5829	
15 minute winter	U6 5	10.000	U6 6	34.6	1.577	0.472	0.4685	
15 minute winter	U6 6	9.001	32	154.3	3.176	0.652	0.5433	
15 minute winter	U6 2	11.000	U6 3	65.8	1.775	0.974	0.6625	
15 minute winter	U6 3	11.001	34	78.1	2.300	0.943	1.1014	
15 minute winter	U5 1	5.000	U5 2	78.4	1.828	0.593	1.5357	
15 minute winter	U5 5	6.001	U5 6	292.0	1.603	0.601	5.6977	
15 minute winter	U5 7	4.003	U5 10	735.9	2.833	1.515	5.5856	
15 minute winter	U2 1	19.004	U2-16	347.6	2.297	1.075	8.0607	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U2 DOCK 1	10	205.948	0.148	50.7	0.6455	0.0000	OK
15 minute winter	U2 3	12	205.919	1.050	176.3	1.7608	0.0000	SURCHARGED
15 minute winter	U2 5	12	206.305	0.805	39.1	1.8455	0.0000	SURCHARGED
15 minute winter	U2 8	11	205.994	1.071	471.8	8.4079	0.0000	SURCHARGED
15 minute winter	U2 9	11	205.921	1.065	857.8	10.2786	0.0000	SURCHARGED
15 minute winter	U2 10	11	205.669	0.884	1120.7	6.6126	0.0000	SURCHARGED
480 minute winter	U2 20	472	205.482	0.522	15.5	1.6208	0.0000	SURCHARGED
15 minute winter	U2 19	10	205.522	0.222	73.5	0.7353	0.0000	OK
360 minute winter	U2 18	360	204.298	1.121	75.5	1.9812	0.0000	SURCHARGED
15 minute winter	U5 10	11	194.050	0.381	758.1	0.8018	0.0000	OK
1440 minute winter	U1 4	1440	209.204	1.004	33.5	5.6339	0.0000	SURCHARGED
15 minute winter	U1 1	11	209.433	0.358	217.1	2.5205	0.0000	OK
15 minute winter	U1 2	11	209.309	0.752	376.2	3.9862	0.0000	SURCHARGED
1440 minute winter	U1 3	1440	209.204	0.754	26.3	4.0312	0.0000	SURCHARGED
1440 minute winter	U1 10	1440	209.204	0.554	4.7	2.1753	0.0000	SURCHARGED
1440 minute winter	U1 11	1440	209.204	0.954	6.3	2.7154	0.0000	SURCHARGED
15 minute summer	U5 8	1	195.300	0.000	0.0	0.0000	0.0000	OK
15 minute summer	U5 9	1	195.156	0.000	0.0	0.0000	0.0000	OK
480 minute winter	U2 14	472	205.482	1.107	15.6	2.8178	0.0000	SURCHARGED
15 minute summer	CP1	32	203.293	0.056	15.0	0.0631	0.0000	OK
30 minute summer	CP2	20	200.774	0.073	15.0	0.0831	0.0000	OK
15 minute summer	CP3	36	198.457	0.057	15.0	0.0644	0.0000	OK
15 minute winter	CP4	14	193.143	0.443	58.3	0.5008	0.0000	SURCHARGED
15 minute winter	CP5	13	193.093	0.783	62.8	0.8855	0.0000	SURCHARGED
15 minute winter	CP6	13	193.180	1.062	71.3	1.2008	0.0000	SURCHARGED
15 minute winter	28A	13	193.189	1.417	765.5	3.6053	0.0000	SURCHARGED
15 minute winter	U2-16	11	204.305	0.387	486.4	1.8657	0.0000	OK
360 minute winter	U2 POND 2	360	204.298	1.148	80.7	547.5559	0.0000	SURCHARGED
240 minute winter	19C	108	192.702	0.102	20.0	0.1152	0.0000	OK
240 minute winter	WEST OUTFALL	108	192.489	0.089	20.0	0.0000	0.0000	OK
1440 minute winter	19B	1680	195.002	1.552	20.1	5.3768	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U2 DOCK 1	21.000	U2 2	49.7	1.886	0.686	0.7027	
15 minute winter	U2 3	19.002	U2 2	182.1	1.651	1.648	3.3269	
15 minute winter	U2 5	19.000	U2 4	39.8	0.703	0.360	3.0960	
15 minute winter	U2 8	1.001	U2 9	447.1	1.016	0.813	14.7291	
15 minute winter	U2 9	1.002	U2 10	836.5	1.901	1.522	15.6018	
15 minute winter	U2 10	1.003	U2 POND 1	1084.3	3.813	1.520	26.7308	
15 minute winter	U2 20	2.001	U2 14	138.2	1.410	1.082	3.1118	
15 minute winter	U2 19	2.000	U2 20	72.3	1.196	0.849	2.7333	
15 minute summer	U2 18	19.007	U2 POND 2	497.8	2.599	1.602	3.6852	
15 minute winter	U5 10	4.004	28	737.6	4.021	0.569	8.1804	
15 minute winter	U1 4	13.003	U1 5	731.7	1.900	1.029	31.7734	
15 minute winter	U1 1	13.000	U1 2	208.6	1.771	0.577	4.3168	
15 minute winter	U1 2	13.001	U1 3	378.0	1.342	0.955	8.9672	
15 minute winter	U1 3	13.002	U1 4	557.8	1.991	1.409	8.4589	
15 minute winter	U1 10	14.000	U1 11	98.2	1.395	1.083	4.2167	
15 minute winter	U1 11	14.001	U1 12	131.4	0.853	0.332	2.6367	
15 minute summer	U5 8	7.000	U5 9	0.0	0.000	0.000	0.0000	
15 minute summer	U5 9	7.001	U5 10	0.0	0.000	0.000	0.0000	
15 minute summer	U2 14	Hydro-Brake®	CP1	15.0				
15 minute summer	CP1	1.006	CP2	15.0	1.857	0.135	0.5350	
30 minute summer	CP2	1.007	CP3	15.0	1.577	0.212	1.1997	
15 minute summer	CP3	1.008	CP4	15.0	1.732	0.080	7.9934	
15 minute winter	CP4	1.009	CP5	62.8	1.058	0.985	4.5249	
15 minute winter	CP5	1.010	CP6	71.3	1.012	1.118	4.0449	
15 minute winter	CP6	1.011	28A	74.7	1.151	1.170	0.9735	
15 minute winter	28A	1.012	29	728.0	1.654	1.324	8.8539	
15 minute winter	U2-16	19.005	U2 17	485.7	2.143	0.631	11.0192	
15 minute summer	U2 POND 2	Hydro-Brake®	7	8.0				
240 minute winter	19C	13.021	WEST OUTFALL	20.0	1.693	0.660	0.0819	453.2
180 minute winter	19B	Hydro-Brake®	19C	20.0				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U3 1	11	203.433	1.133	115.3	4.0564	0.0000	SURCHARGED
1440 minute winter	HIGHWAY POND SOUTH	1680	195.422	1.922	77.0	1208.4090	0.0000	FLOOD RISK
15 minute winter	5	12	205.354	0.354	140.5	0.6455	0.0000	SURCHARGED
15 minute winter	8	11	201.873	0.229	324.9	0.4397	0.0000	OK
15 minute winter	13	12	199.847	1.848	105.5	2.6406	0.0000	SURCHARGED
15 minute winter	14	12	199.550	1.633	462.9	2.9664	0.0000	SURCHARGED
15 minute winter	15	12	198.734	0.895	476.5	1.4461	0.0000	SURCHARGED
15 minute winter	17	12	196.596	1.296	568.8	3.9293	0.0000	SURCHARGED
30 minute winter	21	24	193.564	0.364	9.2	0.4546	0.0000	SURCHARGED
30 minute winter	23	24	193.597	0.672	41.0	1.0833	0.0000	SURCHARGED
15 minute winter	24	12	194.374	1.486	132.5	2.1267	0.0000	SURCHARGED
15 minute winter	25	12	194.349	1.506	205.8	2.4026	0.0000	SURCHARGED
15 minute winter	27	12	194.303	1.666	150.3	2.6860	0.0000	SURCHARGED
15 minute winter	29	13	193.893	2.161	970.4	7.3573	0.0000	SURCHARGED
15 minute winter	U5 4	12	196.128	1.177	132.6	4.6981	0.0000	SURCHARGED
15 minute winter	U5 6	12	195.985	1.661	641.3	10.3756	0.0000	SURCHARGED
960 minute winter	33	945	193.472	1.472	1.1	2.2203	0.0000	FLOOD RISK
960 minute winter	34	945	193.473	2.229	130.0	6.1222	0.0000	SURCHARGED
960 minute winter	HIGHWAY POND EAST	945	193.472	2.472	135.5	2165.2010	0.0000	FLOOD RISK
60 minute winter	EAST OUTFAL	29	190.075	0.075	24.9	0.0000	0.0000	OK
15 minute winter	7	11	202.425	0.313	300.3	0.5690	0.0000	OK
15 minute winter	12	12	200.219	1.947	73.7	2.9967	0.0000	SURCHARGED
15 minute winter	U3 5	11	202.752	1.077	114.9	3.9852	0.0000	SURCHARGED
15 minute winter	26	12	194.339	1.560	178.1	2.8338	0.0000	SURCHARGED
15 minute winter	30	13	193.571	1.912	983.5	5.4198	0.0000	SURCHARGED
960 minute winter	31	945	193.473	1.953	106.9	5.3026	0.0000	SURCHARGED
960 minute winter	32	945	193.473	2.181	121.4	5.9510	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U3 1	22.000	U3 2	109.7	1.558	1.401	2.3966	
15 minute winter	HIGHWAY POND SOUTH	13.019	19B	25.3	0.776	0.691	0.3977	
15 minute winter	5	13.009	6	134.1	2.089	0.987	1.8476	
15 minute winter	8	13.012	14	325.7	4.311	0.438	2.2082	
15 minute winter	13	22.010	14	117.0	1.661	1.834	1.7491	
15 minute winter	14	13.013	15	452.2	2.855	2.815	4.8740	
15 minute winter	15	13.014	16	475.8	3.457	0.652	5.1380	
15 minute winter	17	13.016	19	569.3	3.594	3.544	2.9764	
15 minute winter	21	3.000	22	14.0	0.566	0.220	1.3624	
30 minute winter	23	Orifice	24	56.9				
15 minute winter	24	3.003	25	-129.8	-0.915	-0.734	2.3591	
15 minute winter	25	3.004	26	-184.4	-1.164	-1.148	4.0363	
30 minute summer	27	3.006	28	163.3	1.308	1.016	2.9201	
15 minute winter	29	1.013	30	949.0	2.156	1.726	16.0820	
15 minute winter	U5 4	6.000	U5 5	128.1	1.463	0.376	4.8289	
15 minute summer	U5 6	6.002	U5 7	608.7	2.161	0.703	9.5883	
15 minute winter	33	12.000	34	17.9	1.107	0.349	0.9489	
15 minute winter	34	1.017	HIGHWAY POND EAST	1343.5	4.118	1.214	13.3352	
180 minute summer	HIGHWAY POND EAST	Hydro-Brake®	35	24.9				
15 minute winter	7	13.011	8	301.0	3.017	0.683	2.5096	
15 minute winter	12	22.009	13	85.9	1.220	1.347	5.7740	
15 minute winter	U3 5	23.000	U3 6	107.3	2.698	2.064	0.4652	
15 minute winter	26	3.005	27	-139.2	1.011	-0.866	9.0205	
15 minute winter	30	1.014	31	978.7	2.224	1.780	30.2794	
15 minute winter	31	1.015	32	1043.6	2.372	1.107	17.2136	
15 minute winter	32	1.016	34	1238.9	2.815	2.254	10.7227	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	16	12	197.794	1.494	496.8	2.8904	0.0000	FLOOD RISK
30 minute winter	22	24	193.573	0.512	19.4	0.7325	0.0000	SURCHARGED
15 minute winter	19	12	195.666	0.563	587.7	1.1705	0.0000	OK
1440 minute winter	20	1680	195.422	0.369	88.7	0.7496	0.0000	OK
60 minute winter	35	29	190.891	0.077	24.9	0.0871	0.0000	OK
720 minute winter	U2 POND 1	705	205.876	1.376	134.2	2088.2090	0.0000	SURCHARGED
600 minute winter	U2 17	585	204.642	1.339	70.0	2.3657	0.0000	SURCHARGED
1440 minute winter	U 1 POND	1440	209.595	1.745	83.4	2696.3420	0.0000	FLOOD RISK
15 minute winter	3	12	207.650	1.150	85.5	2.2254	0.0000	SURCHARGED
15 minute winter	U1 7	11	209.608	0.808	72.1	2.1509	0.0000	SURCHARGED
15 minute winter	U2 4	11	206.671	1.682	199.0	6.2951	0.0000	SURCHARGED
15 minute winter	U2 DOCK 2	10	206.500	0.700	126.5	3.6512	22.5750	FLOOD
15 minute winter	U2 2	11	206.141	1.440	331.2	4.3134	0.0000	SURCHARGED
15 minute winter	U2 7	11	207.070	2.082	248.3	11.5994	0.0000	SURCHARGED
1440 minute winter	U4 2	1410	200.969	0.969	2.0	1.9023	0.0000	SURCHARGED
1440 minute winter	U4 5	1410	200.969	1.729	10.6	2.4736	0.0000	FLOOD RISK
1440 minute winter	U3 POND	1410	200.969	1.969	50.2	1399.6280	0.0000	FLOOD RISK
1440 minute winter	U4 9	1410	198.974	0.523	27.8	2.0077	0.0000	OK
15 minute winter	U4 10	10	199.876	0.176	186.4	0.8642	0.0000	OK
1440 minute winter	U4 11	1410	198.974	0.696	50.5	3.4910	0.0000	SURCHARGED
1440 minute winter	U 4 POND	1410	198.974	2.474	54.0	1410.7410	0.0000	FLOOD RISK
15 minute winter	U4 1	11	200.205	0.305	148.4	1.3960	0.0000	OK
15 minute winter	U4 8	11	199.291	0.582	277.9	0.8331	0.0000	SURCHARGED
15 minute winter	U3 DOCK	10	202.750	0.800	38.8	2.1392	3.5529	FLOOD
15 minute winter	U4 DOCK	8	200.250	0.800	186.8	6.8512	32.7858	FLOOD
15 minute winter	U4 6	11	199.899	0.764	201.7	1.0933	0.0000	SURCHARGED
15 minute winter	U5 DOCK	11	195.400	0.800	19.2	0.9048	2.8296	FLOOD
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	16	13.015	17	499.8	3.155	0.963	6.1722	
15 minute summer	22	3.001	23	38.0	0.455	0.204	2.3903	
15 minute winter	19	13.017	20	589.5	3.022	1.721	3.7206	
15 minute winter	20	13.018	HIGHWAY POND SOUTH	602.6	5.413	0.296	3.3231	
60 minute winter	35	1.019	EAST OUTFAL	24.9	1.783	0.138	0.4327	366.0
15 minute winter	U2 POND 1	1.004	U2 14	-163.6	-1.497	-1.646	5.5149	
15 minute summer	U2 17	19.006	U2 18	619.6	2.205	0.900	3.5494	
1440 minute winter	U 1 POND	Hydro-Brake®	2	2.5				
15 minute winter	3	13.007	4	80.2	2.017	1.553	2.3919	
15 minute winter	U1 7	16.000	U1 8	69.1	1.738	1.830	1.0702	
15 minute winter	U2 4	19.001	U2 3	167.6	1.520	1.515	4.2785	
15 minute winter	U2 DOCK 2	20.000	U2 4	60.0	1.945	0.691	0.8405	
15 minute winter	U2 2	19.003	U2 1	331.6	2.093	2.085	7.1746	
15 minute winter	U2 7	1.000	U2 8	226.9	0.516	0.413	14.3312	
15 minute winter	U4 2	25.000	U4 5	43.9	1.949	0.564	0.7165	
15 minute winter	U4 5	25.001	U3 POND	200.2	1.883	0.798	6.2886	
15 minute summer	U3 POND	22.005	9	-27.9	-0.702	-0.763	0.8282	
15 minute winter	U4 9	27.004	U4 11	459.9	2.297	0.947	6.9268	
15 minute winter	U4 10	29.000	U4 11	186.2	3.255	0.297	1.9976	
15 minute winter	U4 11	27.005	U 4 POND	949.5	4.671	0.547	6.2865	
1440 minute winter	U 4 POND	Hydro-Brake®	19 A	6.0				
15 minute winter	U4 1	27.000	U4 6	135.5	1.330	0.676	7.8680	
15 minute winter	U4 8	27.003	U4 9	278.1	1.779	1.497	4.8262	
15 minute summer	U3 DOCK	24.000	U3 7	25.4	1.441	1.080	0.6576	
60 minute winter	U4 DOCK	28.000	U4 6	84.5	2.126	1.626	0.9560	
15 minute winter	U4 6	27.001	U4 7	196.1	1.778	1.202	3.3685	
15 minute winter	U5 DOCK	4.000	U5 2	-19.2	-1.091	-1.328	0.5221	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U5 2	12	195.806	1.553	223.0	5.5070	0.0000	SURCHARGED
15 minute winter	1	12	209.454	0.904	40.5	1.8856	0.0000	SURCHARGED
15 minute winter	9	13	200.599	1.703	35.9	1.9257	0.0000	SURCHARGED
15 minute winter	10	13	200.576	1.882	51.5	2.8706	0.0000	SURCHARGED
15 minute winter	11	12	200.411	1.913	46.7	2.4794	0.0000	SURCHARGED
15 minute winter	U4 7	11	199.532	0.676	277.5	1.8783	0.0000	SURCHARGED
15 minute winter	U5 3	12	195.688	1.736	278.0	4.9645	0.0000	SURCHARGED
1440 minute winter	U1 5	1440	209.595	1.670	45.8	4.2510	0.0000	SURCHARGED
1440 minute winter	U1 6	1440	209.595	0.795	0.5	1.1382	0.0000	SURCHARGED
1440 minute winter	U1 DOCK	1440	209.595	0.795	0.1	0.8995	0.0000	FLOOD RISK
1440 minute winter	U1 8	1440	209.595	0.938	12.6	5.2310	0.0000	SURCHARGED
1440 minute winter	U1 9	1440	209.595	1.145	11.6	1.6389	0.0000	SURCHARGED
1440 minute winter	U1 12	1440	209.595	1.402	12.7	4.8451	0.0000	SURCHARGED
1440 minute winter	U1 13	1440	209.595	1.449	12.5	2.5610	0.0000	SURCHARGED
1440 minute winter	U1 14	1440	209.595	1.504	12.4	2.6582	0.0000	SURCHARGED
15 minute winter	2	12	208.054	0.753	55.1	1.2214	0.0000	SURCHARGED
15 minute winter	4	11	206.040	0.215	110.4	0.3918	0.0000	OK
15 minute winter	6	11	204.694	0.244	265.2	0.9948	0.0000	OK
15 minute winter	U3 2	11	203.024	0.969	307.0	4.9949	0.0000	SURCHARGED
15 minute winter	U3 3	11	202.236	0.336	410.2	1.1165	0.0000	OK
15 minute winter	U3 6	11	202.044	0.486	137.6	0.8358	0.0000	SURCHARGED
15 minute winter	U3 4	11	201.526	0.472	548.8	0.8341	0.0000	OK
15 minute winter	U3 7	11	202.484	1.184	190.8	5.3504	0.0000	SURCHARGED
15 minute winter	U3 8	11	201.089	0.339	732.5	0.5997	0.0000	OK
1440 minute winter	U4 3	1410	200.969	1.469	7.9	6.4882	0.0000	FLOOD RISK
1440 minute winter	19 A	1410	196.453	0.028	6.0	0.0319	0.0000	OK
15 minute winter	28	12	194.293	1.852	971.0	5.2661	0.0000	SURCHARGED
960 minute winter	U6 1	945	193.473	0.298	3.4	0.7012	0.0000	SURCHARGED
960 minute winter	U6 4	945	193.472	0.297	3.3	0.6854	0.0000	SURCHARGED
960 minute winter	U6 5	945	193.472	0.297	3.1	0.6609	0.0000	SURCHARGED
960 minute winter	U6 6	945	193.472	0.776	13.8	2.4026	0.0000	SURCHARGED
15 minute winter	U6 2	12	193.897	1.022	95.2	3.3301	0.0000	SURCHARGED
960 minute winter	U6 3	945	193.473	0.894	7.3	1.3264	0.0000	SURCHARGED
15 minute winter	U5 1	12	196.019	1.219	110.3	4.2331	0.0000	FLOOD RISK
15 minute winter	U5 5	12	196.083	1.622	398.4	9.7981	0.0000	SURCHARGED
15 minute winter	U5 7	12	195.636	1.848	868.0	3.9229	0.0000	SURCHARGED
15 minute winter	U2 1	11	205.544	0.954	422.5	2.5837	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U5 2	4.001	U5 3	197.4	1.375	0.866	4.7665	
30 minute winter	1	18.000	2	31.0	1.865	1.014	0.7480	
15 minute summer	9	22.006	10	-33.2	-0.834	-0.906	1.6042	
15 minute winter	10	22.007	11	39.6	0.997	1.083	1.5567	
15 minute winter	11	22.008	12	55.2	1.387	1.507	1.5140	
15 minute winter	U4 7	27.002	U4 8	277.9	1.754	1.219	3.4420	
15 minute winter	U5 3	4.002	U5 7	256.6	0.995	0.528	9.2289	
15 minute winter	U1 5	13.004	U 1 POND	1017.7	3.086	1.597	11.9416	
15 minute summer	U1 6	15.000	U1 8	-16.1	-0.265	-0.087	4.6852	
15 minute summer	U1 DOCK	17.000	U1 8	-3.0	-0.180	-0.210	0.3786	
15 minute winter	U1 8	15.001	U1 9	274.7	2.299	0.971	3.1796	
15 minute winter	U1 9	15.002	U 1 POND	273.0	3.351	0.555	3.2393	
15 minute winter	U1 12	14.002	U1 13	273.9	1.376	0.692	3.0043	
15 minute winter	U1 13	14.003	U1 14	274.3	1.682	0.801	5.2896	
15 minute winter	U1 14	14.004	U 1 POND	274.9	2.327	0.407	6.6921	
15 minute summer	2	13.006	3	50.8	1.445	0.664	1.4765	
15 minute winter	4	13.008	5	109.8	1.745	0.847	3.7785	
15 minute winter	6	13.010	7	265.1	3.116	0.542	6.1623	
15 minute winter	U3 2	22.001	U3 3	304.2	2.761	1.974	2.8111	
15 minute winter	U3 3	22.002	U3 4	411.3	3.413	0.729	2.7228	
15 minute winter	U3 6	23.001	U3 4	137.5	1.953	1.237	1.4090	
15 minute winter	U3 4	22.003	U3 8	549.8	2.530	0.799	4.9753	
15 minute winter	U3 7	24.001	U3 8	182.7	2.595	1.986	2.5442	
15 minute winter	U3 8	22.004	U3 POND	733.3	4.673	0.565	5.5389	
15 minute winter	U4 3	26.000	U4 5	162.1	2.302	1.459	0.7152	
1440 minute winter	19 A	27.007	19	6.0	0.556	0.034	0.2443	
15 minute winter	28	3.007	28A	953.6	2.167	0.400	7.9635	
15 minute winter	U6 1	8.000	31	53.9	2.058	0.683	0.7792	
15 minute winter	U6 4	9.000	U6 6	50.5	1.541	0.746	0.8556	
15 minute winter	U6 5	10.000	U6 6	47.1	1.571	0.641	0.6799	
15 minute winter	U6 6	9.001	32	210.5	3.223	0.890	0.7896	
15 minute winter	U6 2	11.000	U6 3	82.6	2.077	1.222	0.6989	
15 minute winter	U6 3	11.001	34	98.1	2.467	1.185	1.2803	
15 minute summer	U5 1	5.000	U5 2	93.9	1.818	0.710	1.9867	
15 minute summer	U5 5	6.001	U5 6	347.8	1.412	0.716	7.7399	
15 minute summer	U5 7	4.003	U5 10	872.4	3.124	1.796	6.6856	
15 minute winter	U2 1	19.004	U2-16	423.1	2.670	1.309	8.1913	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	U2 DOCK 1	11	206.500	0.700	71.0	3.0492	0.4103	FLOOD
15 minute winter	U2 3	11	206.406	1.537	183.1	2.5779	0.0000	SURCHARGED
15 minute winter	U2 5	10	206.794	1.294	54.8	2.9664	0.0000	FLOOD RISK
15 minute winter	U2 8	11	207.052	2.129	632.3	16.7214	0.0000	SURCHARGED
15 minute winter	U2 9	11	206.920	2.064	1156.2	19.9276	0.0000	SURCHARGED
15 minute winter	U2 10	11	206.451	1.666	1518.7	12.4655	0.0000	SURCHARGED
720 minute winter	U2 20	705	205.874	0.914	15.7	2.8369	0.0000	SURCHARGED
15 minute winter	U2 19	11	205.941	0.641	102.9	2.1248	0.0000	SURCHARGED
600 minute winter	U2 18	585	204.642	1.465	69.2	2.5883	0.0000	SURCHARGED
15 minute winter	U5 10	12	195.064	1.395	874.9	2.9323	0.0000	SURCHARGED
1440 minute winter	U1 4	1440	209.595	1.395	46.3	7.8290	0.0000	SURCHARGED
15 minute winter	U1 1	11	210.397	1.322	304.0	9.3074	0.0000	SURCHARGED
15 minute winter	U1 2	11	210.070	1.513	521.4	8.0170	0.0000	SURCHARGED
15 minute winter	U1 3	11	209.795	1.345	773.3	7.1878	0.0000	SURCHARGED
15 minute winter	U1 10	11	209.698	1.048	144.9	4.1156	0.0000	SURCHARGED
1440 minute winter	U1 11	1440	209.595	1.345	8.5	3.8288	0.0000	FLOOD RISK
15 minute summer	U5 8	1	195.300	0.000	0.0	0.0000	0.0000	OK
15 minute summer	U5 9	1	195.156	0.000	0.0	0.0000	0.0000	OK
720 minute winter	U2 14	705	205.874	1.499	15.7	3.8149	0.0000	SURCHARGED
240 minute summer	CP1	112	203.293	0.056	15.0	0.0631	0.0000	OK
15 minute winter	CP2	8	200.774	0.074	15.0	0.0836	0.0000	OK
15 minute winter	CP3	10	198.457	0.057	15.1	0.0646	0.0000	OK
15 minute winter	CP4	15	193.937	1.237	94.5	1.3994	0.0000	FLOOD RISK
15 minute winter	CP5	14	193.856	1.546	93.4	1.7487	0.0000	SURCHARGED
15 minute winter	CP6	13	194.019	1.901	102.2	2.1497	0.0000	SURCHARGED
15 minute winter	28A	13	194.084	2.312	953.6	5.8831	0.0000	SURCHARGED
600 minute winter	U2-16	585	204.642	0.725	71.9	3.4903	0.0000	SURCHARGED
600 minute winter	U2 POND 2	585	204.642	1.492	80.9	827.6909	0.0000	FLOOD RISK
15 minute summer	19C	13	192.702	0.102	20.0	0.1152	0.0000	OK
60 minute winter	WEST OUTFALL	30	192.489	0.089	20.0	0.0000	0.0000	OK
1440 minute winter	19B	1680	195.404	1.954	20.1	6.7673	0.0000	FLOOD RISK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	U2 DOCK 1	21.000	U2 2	65.5	1.876	0.903	0.8476	
30 minute winter	U2 3	19.002	U2 2	181.4	1.645	1.642	3.3269	
15 minute winter	U2 5	19.000	U2 4	53.0	0.753	0.479	3.0960	
15 minute winter	U2 8	1.001	U2 9	611.0	1.388	1.111	14.7291	
15 minute winter	U2 9	1.002	U2 10	1144.0	2.600	2.081	15.6018	
15 minute winter	U2 10	1.003	U2 POND 1	1492.8	3.981	2.092	34.1887	
15 minute winter	U2 20	2.001	U2 14	185.2	1.694	1.451	3.5486	
15 minute winter	U2 19	2.000	U2 20	96.0	1.364	1.128	3.1641	
15 minute summer	U2 18	19.007	U2 POND 2	605.7	3.102	1.949	3.6860	
15 minute winter	U5 10	4.004	28	859.3	3.995	0.662	9.7914	
15 minute winter	U1 4	13.003	U1 5	1018.5	2.338	1.432	35.1327	
15 minute winter	U1 1	13.000	U1 2	287.3	1.813	0.794	4.6587	
15 minute winter	U1 2	13.001	U1 3	524.6	1.863	1.325	8.9672	
15 minute winter	U1 3	13.002	U1 4	776.7	2.758	1.962	8.8407	
15 minute winter	U1 10	14.000	U1 11	137.3	1.950	1.514	4.2167	
15 minute winter	U1 11	14.001	U1 12	183.6	0.897	0.464	3.4860	
15 minute summer	U5 8	7.000	U5 9	0.0	0.000	0.000	0.0000	
15 minute summer	U5 9	7.001	U5 10	0.0	0.000	0.000	0.1217	
240 minute summer	U2 14	Hydro-Brake®	CP1	15.0				
240 minute summer	CP1	1.006	CP2	15.0	1.593	0.135	0.5349	
15 minute winter	CP2	1.007	CP3	15.1	1.714	0.214	1.2036	
15 minute winter	CP3	1.008	CP4	15.1	1.765	0.080	8.0119	
15 minute summer	CP4	1.009	CP5	-81.3	-1.155	-1.275	4.5249	
15 minute winter	CP5	1.010	CP6	-93.4	-1.327	-1.465	4.0449	
15 minute winter	CP6	1.011	28A	-102.2	-1.451	-1.602	0.9735	
15 minute winter	28A	1.012	29	858.5	1.951	1.562	8.8539	
15 minute winter	U2-16	19.005	U2 17	615.7	2.240	0.799	12.8636	
60 minute winter	U2 POND 2	Hydro-Brake®	7	8.0				
60 minute winter	19C	13.021	WEST OUTFALL	20.0	1.693	0.660	0.0819	284.7
30 minute summer	19B	Hydro-Brake®	19C	20.0				

APPENDIX F – EXCEEDANCE PLAN

APPENDIX G – DRAINAGE INSPECTION & MAINTENANCE SCHEDULE

Maintenance Schedule	Required Action	Typical Frequency
Below Ground Drainage Pipes, Manholes, Outfall headwalls, ditches, trash screens etc		
Regular Maintenance	Lift covers and inspect manholes for evidence of debris and silt deposits and evidence of blockages (standing water). Carry out CCTV survey if required. Inspect ditches, trash screens, headwalls etc. and clear debris and silt deposits to avoid restriction to flow.	Quarterly or following significant rainfall events.
Remedial Actions	High pressure jetting and/or remove minor blockages and silt build up	As required – 20% loss of pipe cross-section
	Replace broken access covers, remove major blockages, repair structurally defective pipework	As required
Flow control chamber		
Regular Maintenance	Lift covers and inspect chamber fore evidence of debris and silt deposits and evidence of blockages. Test bypass door operating correctly.	Quarterly or following significant rainfall events.
Remedial Actions	High pressure jetting and or remove minor blockages and silt build up	As required
	Replace broken access covers, remove major blockages, repair/replace defective flow control devices	As required
Linear channel drains and gullies		
Regular Maintenance	Lift access covers and inspect for silt/debris accumulation	Quarterly or following significant rainfall events.
Remedial Actions	Replace broken access covers, gratings	Annually
	High pressure jetting and/or remove minor blockages and silt build up	As required
Rainwater pipes		
Regular Maintenance	Inspect rainwater goods for evidence of leaking pipework	Monthly (or as required)
Occasional Maintenance	Remove rodding eyes and carry out high pressure jetting to remove any debris	Quarterly
Remedial Actions	Replace cracked / leaking pipework	As required
Ponds		
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)

Maintenance Schedule	Required Action	Typical Frequency
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at the start, then as required)
	Inspect inlets, outlets, bankside, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1 to 5 years, or as required
Occasional Maintenance	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required

Maintenance Schedule	Required Action	Typical Frequency
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows	As required
Attenuation Tank (Maintenance activities recommended by the manufacturer should be added to this schedule where not included)		
Regular maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation.	Six monthly
	Change the filter media	As recommended by manufacturer
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor performance	Six monthly
	Inspect sediment accumulation rates and filter media, and establish appropriate replacement frequencies.	Monthly during first half of the year, then every six months
Pumps (Maintenance activities recommended by the manufacturer should be added to this schedule where not included)		
Regular Maintenance	Ensure sumps and Floats are clean	Quarterly
	Assess the condition of the pipework for wear or damage	Quarterly
	Lift covers and inspect manholes for evidence of debris and silt deposits and evidence of blockages - quarterly	Quarterly
	Examine the condition of pump including impeller, seals, valves and pipework (as recommended by the manufacturer)	Quarterly
Remedial Actions	Consult pump specialist	As Required
	Service and replace and elements of the system	Six Monthly

APPENDIX H – EXISTING SEWER PLANS

APPENDIX I – SEVERN TRENT WATER CORRESPONDENCE

WONDERFUL ON TAP



BWB Consulting,
11 Portland Street (Aytoun St Side),
Manchester,
M1 3HU

F.A.O: Matthew Bailey

18/04/2024

Dear Sir/Madam,

Severn Trent Water Ltd
Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

www.stwater.co.uk

Email:
Network.Solutions@SevernTrent.co.uk

Page Barot

Tel:
Our ref: 1113425

Proposed Development: (18 Commercial units – 4.22 l/s) Land North East of Junction 22, M1, Markfield, LE67 9PX, 448150, 311450

I refer to your 'Development Enquiry Request' in respect of the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) which refer to surface water disposal from development sites.

Protective Strip

No public sewers within site boundary.

Due to a change in legislation on 1 October 2011 there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records, but are located in your client's land. These sewers would require protective strips of 3 metres either side of the sewer's centreline that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Please note: there is no guarantee that you will be able to build over or close to any Severn Trent sewers, and where a diversion is required there is no guarantee that you will be able to undertake those works on a self-lay basis. Every approach to build near to or divert our assets has to be assessed on its own merit and the decision of what is or isn't permissible is taken based on the risk to the asset and the wider catchment it serves. It is vital therefore that you contact us at the earliest opportunity to discuss the implications of our assets crossing your site. Failure to do so could significantly

affect the costs and timescales of your project if it transpires diversionary works need to be carried out by Severn Trent.

Foul Water Drainage

Although MH - SK47117201 is closest to the site, connection to this network will require crossing the motorway and the network is well known within Severn Trent due to the capacity issues within this area. I have liaised with our planning team and there currently isn't a scheme taking place however one was previously created for this area but this has since been confirmed that this is unviable.

The 150mm foul sewer, MH SK48107601 along Ashby Road would be the most suitable connection point for your development. Connection to this point would require a pumped solution due to the inconsistencies of the land. As the sewer capacity is reduced in this area, modelling will be required to see if the network can assist with the additional flows.

However, we are undergoing a prioritisation process of all investment requirements and emerging risks from growth on our network and treatment works as we build our plan for the coming Asset Management Plan period (2025-2030) and beyond. We will pass details of your site over for consideration and feedback if anything arises which is of concern. We will let you know as soon as possible if anything will affect your connection point or timescales, should we need to make representation to the Planning Authority to apply conditions relating to phasing or occupation of the site.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter).

Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, subject to the developer discussing all aspects of the developments surface water drainage with the Local

Lead Flood Authority (LLFA). Any discharge rate to a watercourse or drainage ditch will be determined by the LLFA / EA.

Note, STW will have to be satisfied that all sustainable options have been exhausted before allowing discharge to the public network.

Sewer records show a drainage system that runs east of the site. It is advised to pursue a connection to this if feasible, with flow rates to be agreed by the LLFA.

Please note, there isn't any surface water sewers within proximity of the site and under no circumstances will we accept a Surface water flow into a combined/foul sewer.

Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit a Section 106 application form. Our Developer Services department are responsible for handling all new connections enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk.

Please quote the above reference in any future correspondence (including e-mails) with STW Limited. Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely



Page Barot
Network Solutions
Developer Services