

**BRADLEY VILLA FARM, BRADLEY ROAD, BRADLEY,  
HUDDERSFIELD, HD2 2JX**

**FLOOD RISK ASSESSMENT  
FINAL REPORT V1.3**

**May 2021**

|               |                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------|
| Report Title  | <b>Bradley Villa Farm, Bradley Road, Bradley, Huddersfield, HD2 2JX</b><br>Flood Risk Assessment<br>Final Report v1.3 |
| Client        | Redrow Homes (Yorkshire) Ltd, R. Kershaw and S. Gill                                                                  |
| Date of issue | 4 May 2021                                                                                                            |

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|-------------------------|---------------------------------------------------------------------|
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## 1 INTRODUCTION

### 1.1 Background

Weetwood Services Ltd ('Weetwood') has been instructed by Redrow Homes (Yorkshire) Ltd, R. Kershaw and S. Gill to prepare a Flood Risk Assessment (FRA) report for the proposed development of land at Bradley Villa Farm, Bradley, Huddersfield ('the site').

The assessment has been undertaken in accordance with the requirements of the revised National Planning Policy Framework (NPPF) updated on 19 June 2019 and the National Planning Practice Guidance (NPPG) updated on 1 October 2019.

The site is allocated for housing (site reference HS11) in the adopted Kirklees Local Plan (2019). Flood Risk and Drainage Assessment (FRDA) reports have been prepared by Weetwood<sup>1</sup> for the "Bradley Villa Farm Phase of Development" of the site (referred to as "BVF Phase" in **Figure 1**; for consistency within this report, it will be referred to as BVF Phase) and by Alan Wood and Partners<sup>2</sup> for "Land at Tithe House Way" (see **Figure 1**). Both assessments are reported separately and referenced in **Section 1.3** and in Footnotes 1 and 2. For completeness, both parcels of land are included within this report including a summary of the proposed surface water drainage strategies outlined within the FRDA reports.

### 1.2 Structure of the Report

The report is structured as follows:

|                  |                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Section 1</b> | Introduction and report structure                                                                                                   |
| <b>Section 2</b> | Provides background information relating to the development site                                                                    |
| <b>Section 3</b> | Presents national and local flood risk and drainage planning policy                                                                 |
| <b>Section 4</b> | Assesses the potential sources of flooding to the development site                                                                  |
| <b>Section 5</b> | Presents flood risk mitigation measures based on the findings of the assessment                                                     |
| <b>Section 6</b> | Addresses the effect of the proposed development on surface water runoff and presents an illustrative surface water drainage scheme |
| <b>Section 7</b> | Presents a summary of key findings and the recommendations                                                                          |

### 1.3 Relevant Documents

The assessment has been informed by the following documents:

- Calder Catchment Strategic Flood Risk Assessment (SFRA), Volume I, Kirklees Council, Calderdale Metropolitan Borough Council and Wakefield Council, April 2016
- Calder Catchment Strategic Flood Risk Assessment (SFRA), Volume II, Kirklees Council, July 2016
- Bradley Golf Course Flood Risk and Drainage Plan Report for Kirklees Council, Revision P1, RES Environmental Ltd, March 2018
- Bradley Villa Farm Phase of Development, Bradley Road, Bradley, Huddersfield, HD2 2JX, Flood Risk and Drainage Assessment, Final Report v1.5, Weetwood, May 2021
- Flood Risk and Drainage Assessment for Cushman and Wakefield Debenham Tie Leung Limited, Proposed Development – Land at Tithe House Way, Bradley Park (Phase 1), Huddersfield, West Yorkshire, HD2 1RD, Alan Wood and Partners, December 2019 (Issue G)

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<sup>1</sup> Bradley Villa Farm Phase of Development, Bradley Road, Bradley, Huddersfield, HD2 2JX, Flood Risk and Drainage Assessment, Final Report v1.5, Weetwood, May 2021

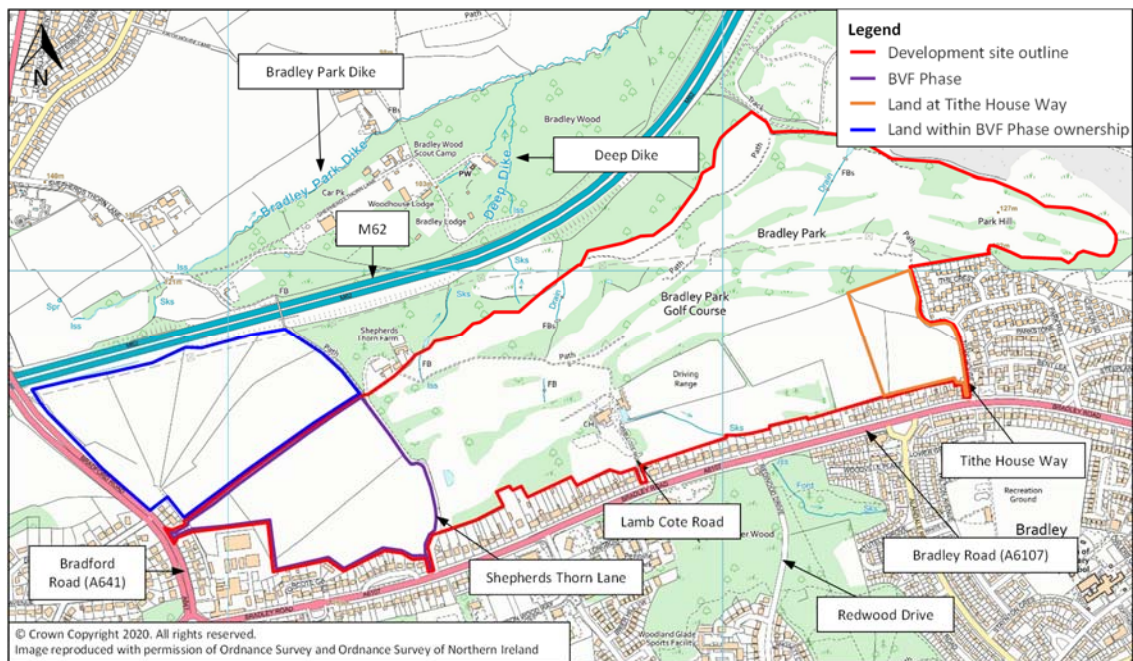
<sup>2</sup> Flood Risk and Drainage Assessment for Cushman and Wakefield Debenham Tie Leung Limited, Proposed Development – Land at Tithe House Way, Bradley Park (Phase 1), Huddersfield, West Yorkshire, HD2 1RD, Alan Wood and Partners, December 2019 (Issue G)

## 2 SITE DETAILS AND PROPOSED DEVELOPMENT

### 2.1 Site Location

The approximately 71 hectare (ha) greenfield site is located at Bradley Villa Farm and Bradley Park Golf Course, Bradley, Huddersfield at Ordnance Survey National Grid Reference SE 158 208, as indicated by the red line on **Figure 1**. The purple and orange lines on **Figure 1** indicates Parcels R and A respectively.

The site is located to the north of Bradley Road, to the east of Bradford Road, to the west of Bradley Park Waste Management and a residential estate and to the south of woodland and the M62. Bradley Park Golf Course and Driving Range is located within the site outline.



**Figure 1: Site Location**

### 2.2 Existing and Proposed Development

The development proposals are for a residential led mixed-use garden suburb development comprising circa 1,958 dwellings, a two-form entry primary school, a local centre, landscaping/greenspace and associated infrastructure. A concept masterplan is provided in **Appendix A**.

The NPPG classifies residential and educational development as More Vulnerable to flood risk.

### 2.3 Waterbodies in the Vicinity of the Site

Bradley Park Dike flows predominantly in a north-easterly direction a minimum of approximately 330 m to the north of the site. Based on OS mapping, it is assumed that Bradley Park Dike flows into the Calder and Hebble Navigation Kirklees Cut approximately 500 m to the north of the eastern portion of the site.

Deep Dike issues within the western portion of the site near to the northern boundary and flows in a north-easterly direction towards Bradley Park Dike approximately 380 m to the north of the site.

The River Calder, a designated main river, is located approximately 520 m to the north of the site. The Calder and Hebble Navigation Kirklees Cut spurs off the right bank of the River Calder approximately 500 m north of the site.

Two unnamed watercourses are indicated to emerge on site (for the purposes of this report, these are referred to as Unnamed Watercourse 1 (UW1) and UW2; it is unclear from OS mapping where UW1 and UW2 flow to although UW1 appears to flow into a pond.

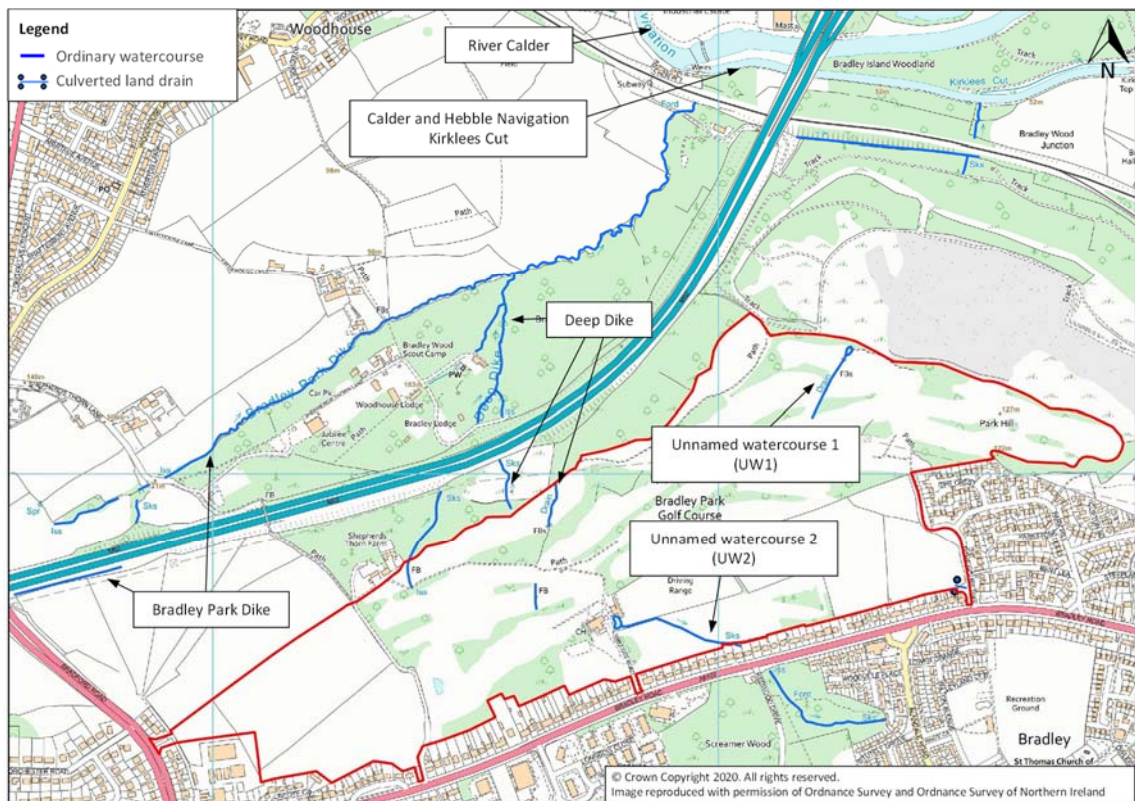
The FRDA report prepared by Alan Wood and Partners<sup>2</sup> states that a previous drainage assessment concluded that the pond does not appear to have any outfalls, and that based on Flood Risk from Surface Water mapping (see **Figure 4**,) flow from this pond may follow a route along the northern boundary of the site and then adjacent to the M62 potentially discharging to Bradley Park Dike via a culvert under the M62 to the north.

The FRDA report states that UW2 leaves the site via a culverted course between dwellings on Bradley Road near to Redwood Drive, eventually connecting into a watercourse located in Screamer Wood adjacent to Redwood Drive.

In addition, the report identifies a culverted land drain located in the south-eastern corner of Land at Tithe House Way.

Larger rivers and streams are usually designated as 'main river'; other rivers are called 'ordinary watercourses'. All ordinary watercourses are shown in **Figure 2**.

The Environment Agency carries out maintenance, improvement and construction work on main rivers to manage flood risk. Lead local flood authorities, district councils and internal drainage boards carry out flood risk management work on ordinary watercourses.



**Figure 2: Location of Ordinary Watercourses**

## 2.4 Ground Conditions

A geo-environmental appraisal of BVF Phase was undertaken in March 2019 by Lithos<sup>3</sup>. Fieldwork was undertaken between 12 and 14 February 2019 and included 41 No. trial pits up to depths of 3.1 m and soakaway tests within six trial pits.

The appraisal report described ground conditions as follows:

- Topsoil: Slightly sandy slightly gravelly clay up to a typical depth of 300 mm
- Cohesive residual soil: Slightly sandy slightly gravelly clay up to a depth of 1.9 m
- Granular residual soil: Slightly clayey sands and gravel/cobble encountered below the cohesive residual soils up to a depth of 3.0 m
- Bedrock: Encountered at the base of each trial pit up to a depth of 3.1 m

Groundwater seepages were encountered in six trial pits between depths of 1.2 m and 2.4 m.

Soakaway tests were carried out in general accordance with BRE 365<sup>4</sup> to determine infiltration rates. Water levels did not fall sufficiently to enable an infiltration rate to be determined in five of the trial pits. The report concluded that soakaways are unlikely to provide a suitable drainage solution for the discharge of surface water runoff at the site.

A Phase 1 geo-environmental appraisal was undertaken for Land at Tithe House Way in October 2018 by Alan Wood and Partners<sup>5</sup>. The report indicates that the underlying bedrock formation comprises Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone) and that no superficial deposits were recorded.

As part of the Land at Tithe House Way FRDA report fieldwork was undertaken comprising of four trial pits. Ground conditions are described as predominantly clayey up to a depth of 0.8 m bgl underlain by Pennine Lower Coal Measures.

British Geological Survey mapping of surface geology<sup>6</sup> indicates that the underlying bedrock at the site comprises of a combination of Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone) and Thick Stone (sandstone). No superficial deposits are recorded.

The National Geoscience Data Centre's Single Onshore Borehole Index<sup>7</sup> holds records of two on-site boreholes and a number of boreholes in the vicinity of the site, in particular along the course of the M62. Records indicate that ground conditions comprise of layers of clay, sandstone, siltstone and shale.

According to the MAGIC website<sup>8</sup> the underlying bedrock is classified as a Secondary A aquifer. The site is not shown to be located within a designated groundwater source protection zone.

## 2.5 Site Levels

LiDAR data has been used to develop a digital terrain model of the site and surrounding area as illustrated in **Figure 3**. Ground levels range between approximately 93.8 metres Above Ordnance Datum (m AOD) to 168.5 m AOD with levels generally falling in a north-easterly/easterly direction. The south-eastern portion of the site falls in a south-easterly direction.

<sup>3</sup> Land at Bradley Villa Park, Huddersfield. Geoenvironmental Appraisal. Lithos, March 2019

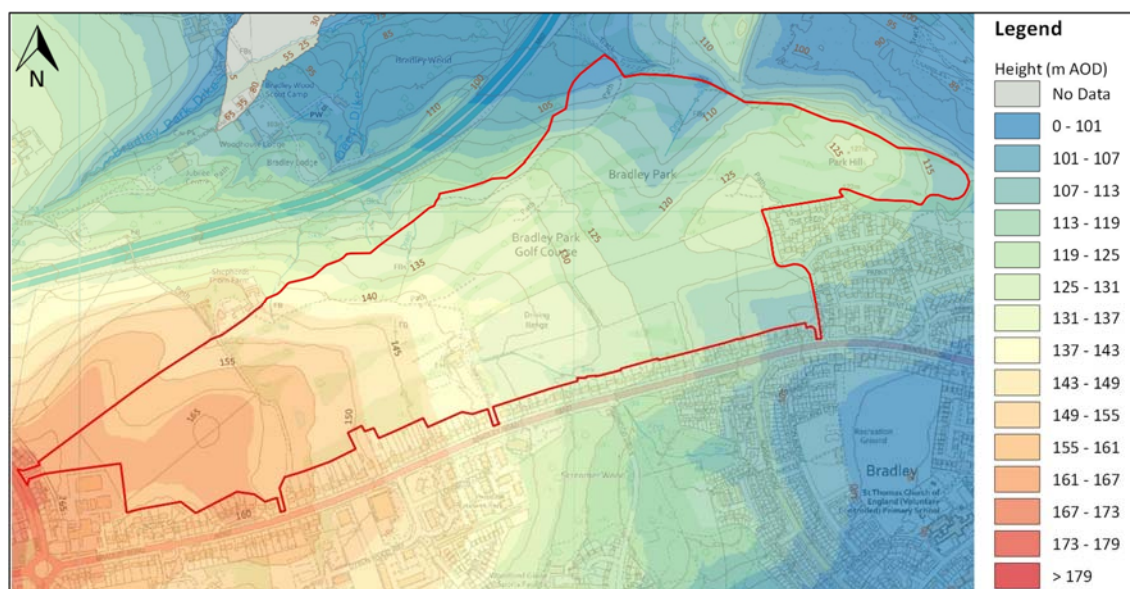
<sup>4</sup> BRE Digest 365 Soakaway Design, Building Research Establishment, 2016

<sup>5</sup> Phase 1 Geo-Environmental Assessment Report and Coal Mining Risk Assessment, Tithe House Way, Bradley Park, Huddersfield, HD2 1RD, Alan Wood and Partners, October 2018

<sup>6</sup> <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

<sup>7</sup> <https://www.bgs.ac.uk/products/onshore/SOBI.html>

<sup>8</sup> <https://magic.defra.gov.uk/MagicMap.aspx>



**Figure 3: Digital Terrain Model from Topographic Survey**

## 2.6 Access and Egress

The site is accessed via Bradford Road and via Shepherds Thorn Lane, Lamb Cote Road and Tithe House Way off Bradley Road. Approximate ground levels at the site access points are as follows:

- Bradford Road: 168.5 m AOD
- Shepherds Thorn Lane: 157.9 m AOD
- Lamb Cote Road: 137.8 m AOD
- Tithe House Way: 108.9 m AOD

## 2.7 Flood Zone Designation

Flood zones refer to the probability of river and sea flooding. Table 1 of the NPPG defines flood zones as follows<sup>9</sup>:

- Flood zone 1: Low Probability. Land having a less than 1 in 1,000 annual probability of river or sea flooding
- Flood zone 2: Medium Probability. Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding
- Flood zone 3a: High Probability. Land having a 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability of sea flooding
- Flood zone 3b: Functional Floodplain. Land where water has to flow or be stored in times of flood.

The flood zones are shown on the Environment Agency Flood Map for Planning (Rivers and Sea)<sup>10</sup>.

The flood zones shown on the flood map are defined by the predicted extent of flooding during the present day 1 in 100 (non-tidal rivers), 1 in 200 (tidal rivers and sea) and 1 in 1,000 (rivers and sea) annual exceedance probability (AEP) events. The zones do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

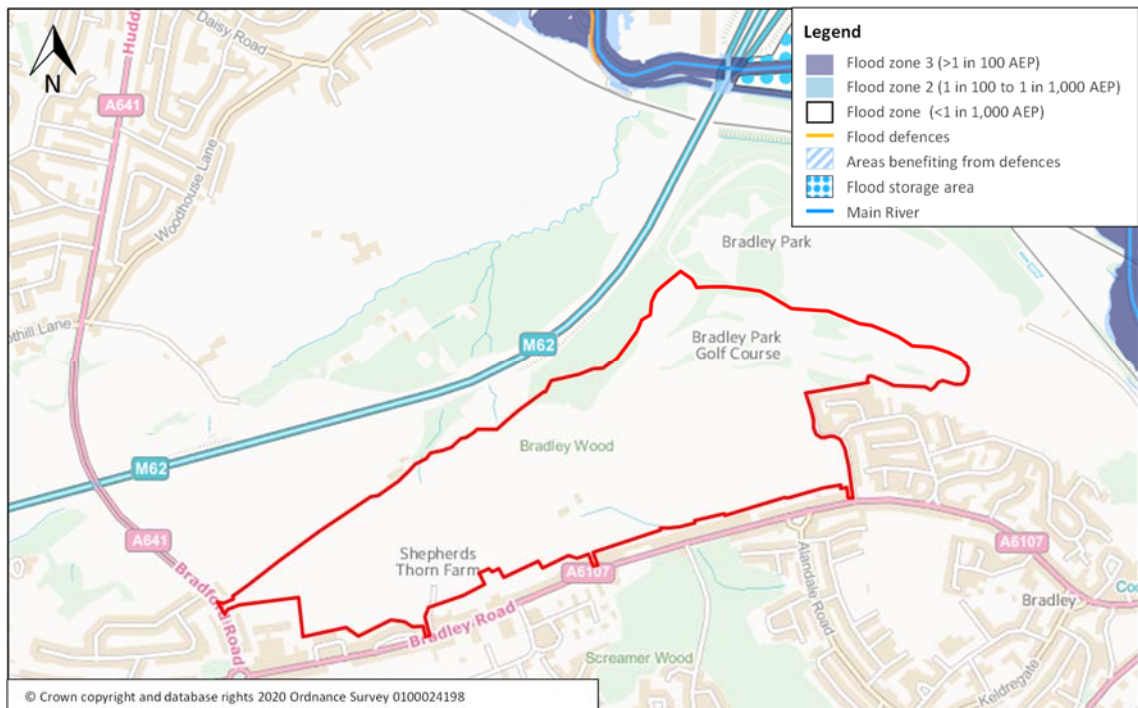
<sup>9</sup> <https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-zone-and-flood-risk-tables>

<sup>10</sup> <https://flood-map-for-planning.service.gov.uk/>

Flood zone 3b (functional floodplain) is not separately distinguished on the Flood Map for Planning but is usually identified by local planning authorities in their SFRAs. The boundary of flood zone 3b is normally defined as land that would flood during the present day 1 in 20 AEP event, although definitions may vary particularly in some districts and in urban areas.

Where an area benefits from formal flood defences providing a minimum standard of protection, the defended area may be indicated as an area benefiting from flood defences. However, not all areas are shown as such, and unless specifically indicated, the Flood Map for Planning conservatively shows land at risk of flooding in the absence of flood defences.

The Environment Agency Flood Map for Planning (**Figure 4**) indicates the site to be located in flood zone 1. Map K of the SFRA reaffirms the sites flood zone 1 designation.



**Figure 4: Flood Map for Planning**  
Source: gov.uk website; Accessed: March 2021

### 3 PLANNING POLICY AND GUIDANCE

#### 3.1 National Requirements

##### 3.1.1 Water Framework Directive

The Water Framework Directive (WFD) provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England, and seeks to:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters
- Achieve at least 'good' status for all waterbodies by 2015
- Promote the sustainable use of water as a natural resource
- Conserve habitats and species that depend directly on water
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of floods and droughts.

The WFD applies to any proposed development which has the potential to impact on a waterbody. Where this is the case, the Environment Agency may require evidence demonstrating that the proposed development does not compromise the aims of the WFD.

##### 3.1.2 National Planning Policy Framework

The NPPF sets out government's planning policies for England and how these are expected to be applied. The NPPF seeks to ensure that flood risk is taken into account at all stages in the planning process and is appropriately addressed.

Footnote 50 of the NPPF states that a site-specific flood risk assessment should be submitted for all development proposed in flood zone 2 and flood zone 3 whilst in flood zone 1, an assessment should accompany all proposals involving: sites of 1 ha or more; land identified as having critical drainage problems or as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

NPPF paragraph 155 states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk but accepts that where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. The policy of seeking to direct development away from areas at highest risk of flooding is implemented through the application of the sequential test (NPPF paragraph 158).

Paragraph 159 of the NPPF states that if it is not possible for a development to be located in zones with a lower risk of flooding, taking into account wider sustainable development objectives, the exception test may have to be applied.

The need for the exception test will depend on the flood zone of the site and the vulnerability of the development proposed (as set out in NPPG Table 2 and 3).

NPPF paragraph 160 states that application of the exception test for development proposals at the application stage should be informed by a site-specific flood risk assessment. For the test to be passed it should be demonstrated that: the development would provide wider sustainability benefits to the community that outweigh the flood risk; and the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

NPPF Paragraph 161 states that both elements of the exception test should be satisfied for development to be permitted.

NPPF paragraph 163 states that development should only be allowed in areas at risk of flooding if it incorporates sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate. NPPF paragraph 165 states that applications for major developments should incorporate sustainable drainage systems to appropriate operational standards and with maintenance arrangements in place unless there is clear evidence that this would be inappropriate.

### 3.1.3 National Guidance

Non-statutory technical standards for sustainable drainage published by DEFRA in March 2015 set out how surface water runoff generated during the present day 1 in 30 and 1 in 100 AEP rainfall events and for events exceeding the present day 1 in 100 AEP event should be managed, how peak runoff rates should be restricted and how runoff volumes should be controlled.

## 3.2 Local Planning Policy and Guidance

The Kirklees Local Plan was adopted on 27 February 2019. The following policies are relevant in respect of flood risk and drainage:

- Policy LP5: Masterplanning Sites Part M states, in part, that masterplans will be expected to provide appropriate measures to mitigate flood risk and ensure that the development is resilient to the potential impacts of climate change.
- Policy LP24: Design Part D vii states, in part, that proposals should promote good design by ensuring high levels of sustainability through designing buildings that are resilient and resistant to flood risk.
- Policy LP27: Flood Risk is summarised as follows:
  - *Proposals for development which require a Sequential Test will need to demonstrate that development has been directed to areas at the lowest probability of flooding, following a sequential risk-based approach*
  - *Proposals within flood zone 3ai will be assessed in accordance with national policies relating to flood zone 3a but with all of the following additional restrictions: No new highly vulnerable or more vulnerable uses will be permitted; Less vulnerable uses may only be permitted where the sequential test has been passed and where extensions are linked operationally to an existing business or where redevelopment of a site provides buildings with the same or a smaller footprint*
  - *All proposals will be expected to include flood mitigation measures which should be identified and considered through a site-specific flood risk assessment*
  - *Development will not be permitted within the functional floodplain*
- Policy LP28: Drainage is summarised as follows:
  - *SuDS will be used to assist in achieving the following:*
    - *Greenfield runoff rates should not be exceeded*
    - *Brownfield sites should have a minimum 30% reduction in runoff where previous positive surface water connections from the site can be proven. New connections will be subject to at least greenfield restrictions*
    - *No negative impact on local water quality*
    - *Consider whether proposed open spaces and green infrastructure within sites can contribute to sustainable drainage of the site*
  - *Local conditions may require a lower runoff rate to be agreed to reflect volume control, local surface water risks, watercourse capacity and flood risk further downstream*
  - *There will be a general presumption against pumping surface water. Also demonstrate that the surface water management solution is designed for the lifetime of the development including maintenance arrangements*
  - *Accommodate flow paths by ensuring paths are designed to avoid buildings and curtilages*
  - *Development will only be permitted if water supply and waste water infrastructure is available or can be co-ordinated to meet the demand from the new development.*

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### **3.3 Land Drainage Consent**

Land drainage consent may be required from the lead local flood authority or drainage board for work to an ordinary watercourse.

Undertaking activities controlled by local byelaws also requires the relevant consent.

## 4 REVIEW OF FLOOD RISK

### 4.1 Sequential Test and Exception Test

The site is located within flood zone 1. As such the proposals satisfy the requirements of the sequential test and the exception test need not be applied. Nevertheless, the proposals are still required to meet the requirements for site specific flood risk assessments.

### 4.2 Historical Records of Flooding

There are no records of historic flooding at the site in the SFRA or in the Environment Agency's Recorded Flood Outlines database<sup>11</sup>.

### 4.3 Fluvial Flood Risk

The Flood Map for Planning only presents flood outlines for watercourses with a catchment area greater than 3.0 km<sup>2</sup>; land in the vicinity of watercourses with a smaller catchment area is shown to be in flood zone 1 by default. As such, the flood map may not represent flood risk from small watercourses.

The catchment area for Bradley Park Dike (including Deep Dike) is 1.64 km<sup>2</sup> i.e. below the 3.0 km<sup>2</sup> mapping threshold. UW1 and UW2 are not recognised on the FEH web service. In instances such as this, the Flood Risk from Surface Water map provides a useful proxy for fluvial flood risk.

The Flood Risk from Surface Water map (**Figure 5** and **Figure 6**) indicates that land adjacent to the on-site watercourses are at Low risk of flooding during extreme events, and therefore, there may be some propensity for localised flooding from the on-site watercourses with flood depths predominately less than 300 mm.

### 4.4 Flood Risk from Surface Water

The Flood Risk from Surface Water map (**Figure 5**) indicates that the site is predominantly at Very Low risk of flooding from surface water. A small number of surface water flow paths are indicated to be present on-site, however, most of the flow paths coincide with the on-site watercourses and as such, the risk of flooding is assumed to be associated with the watercourses. A surface water flow path is indicated to be present in the south-eastern corner of the site where the natural contours of the land forms a shallow swale feature where overland flow would be directed. The risk and extent of surface water flow paths, however, are reduced during less extreme events (**Figure 6**).

### 4.5 Flood Risk from Reservoirs, Canals and Other Artificial Sources

The site is a minimum of approximately 40 m above ground levels adjacent to the canal. Given the difference in elevation levels, the site is not considered to be at risk of flooding from this source. There are no other impounded waterbodies located within the immediate vicinity of the site. The Flood Risk from Reservoirs map indicates that the site is not at risk of flooding from such sources. The site is therefore not assessed to be at risk of flooding from reservoirs, canals or other artificial sources.

### 4.6 Flood Risk from Groundwater

The JBA Groundwater Flood Risk Indicator map (**Figure 7**) indicates that the site is at Negligible to Very Low risk of flooding from groundwater i.e. peak groundwater levels are at least 5.0 m below the ground surface during a 100 year return period event.

<sup>11</sup> <https://data.gov.uk/dataset/16e32c53-35a6-4d54-a111-ca09031eaaaf/recorded-flood-outlines>

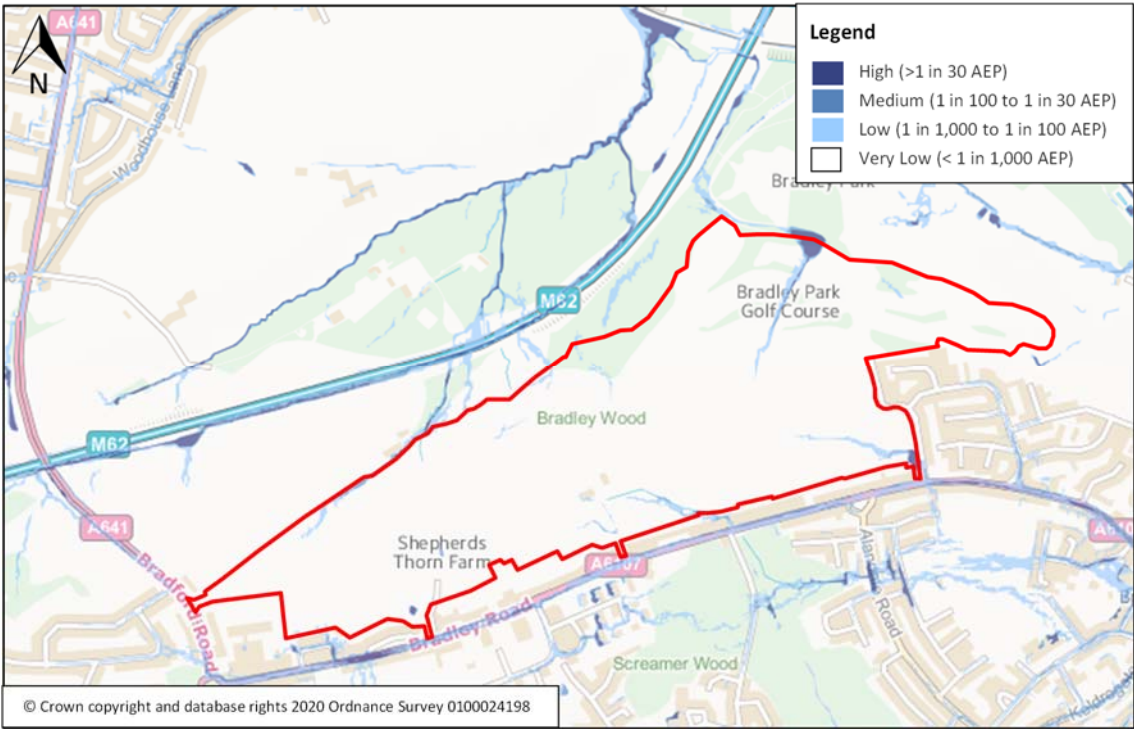


Figure 5: Flood Risk from Surface Water  
Source: gov.uk website; Accessed: March 2021

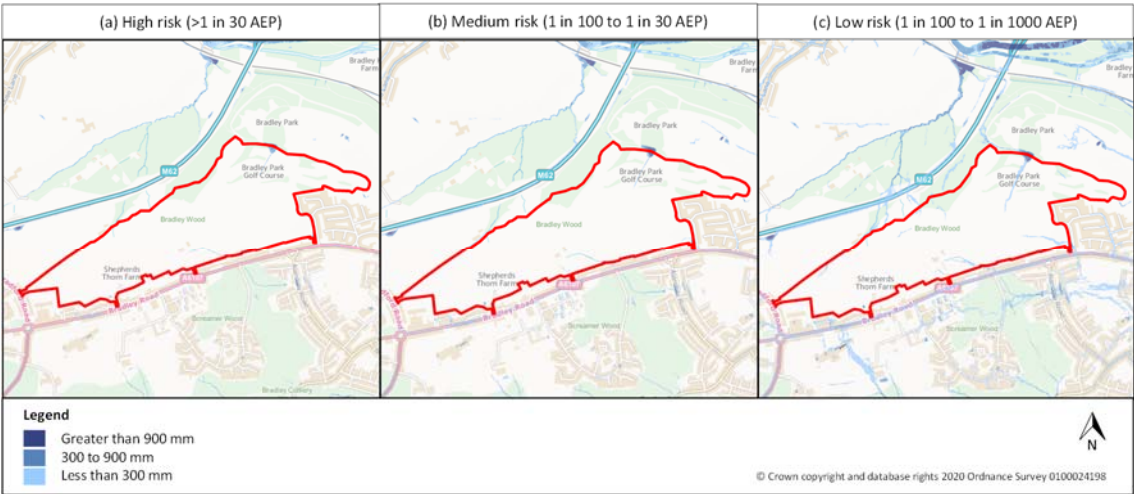


Figure 6: Flood Risk from Surface Water - Depth  
Source: gov.uk website; Accessed: March 2021

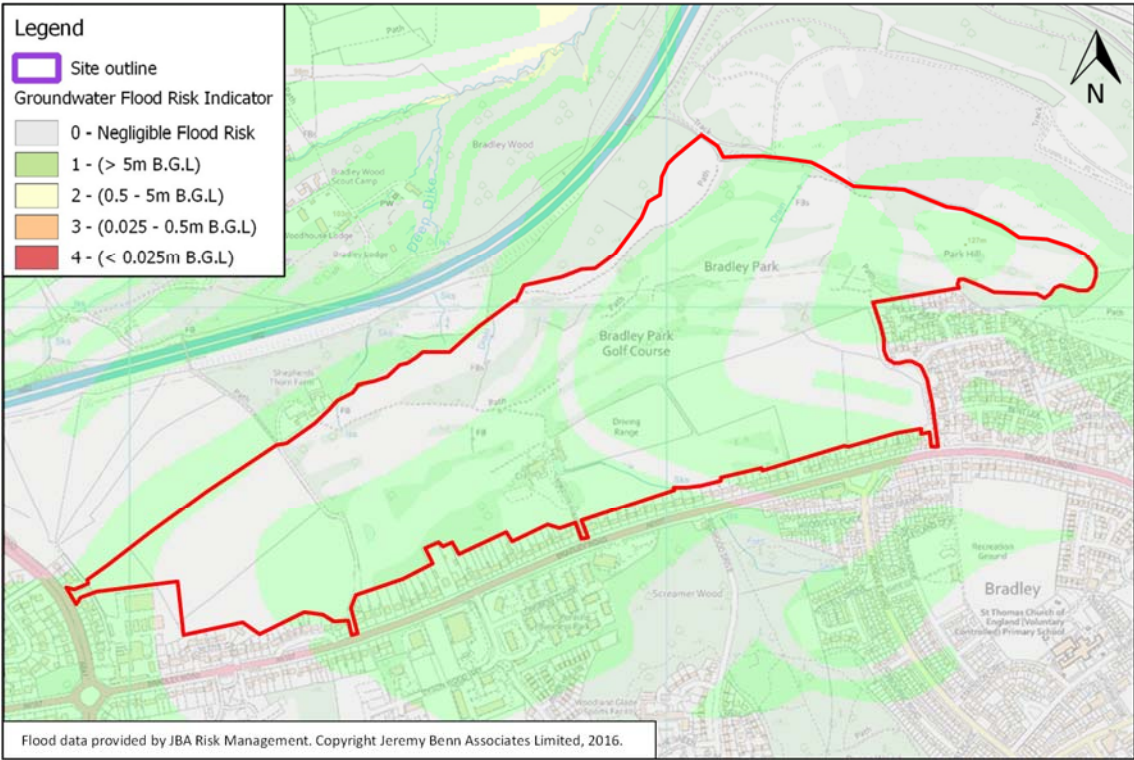


Figure 7: JBA Groundwater Flood Risk Indicator Map  
Source: Blue Sky Maps; Accessed: September 2020

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## 5 FLOOD RISK MITIGATION MEASURES

The risk of flooding to the proposed development from local watercourses and surface water will be mitigated through the implementation of the measures proposed within the following section of this report.

### 5.1 Finished Floor Levels

Finished floor levels should be set at a minimum of 0.15 m above adjacent ground levels following any reprofiling of the site.

This will, subject to the implementation of an appropriately designed surface water drainage scheme (**Section 6**), enable any potential overland flows to be conveyed safely across the site without affecting property in accordance with the approach promoted by government policy<sup>12</sup>.

### 5.2 Bridge Design Principles

The conveyance capacity of any new culverts or bridges over Deep Dike and/or UW2 should maintain existing channel conveyance capacity so as not to increase flood risk; further details are to be provided at the detailed design stage.

### 5.3 Drain Maintenance

A maintenance regime should be implemented to minimise the risk of channel and/or culvert blockage.

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<sup>12</sup> Making Space for Water, Taking forward a new Government strategy for flood and coastal erosion risk management in England, March 2005, Dept for Environment, Food and Rural Affairs

## 6 SURFACE WATER MANAGEMENT

### 6.1 Surface Water Drainage at the Existing Site

The site is undeveloped greenfield. As detailed in the RES report, the golf course has a complex drainage system, consisting of field drains and open drainage ditches; most of these ditches were reported to be dry during a site visit (March 2018) despite much of the ground being saturated with pooled water within localised low spots thus demonstrating poor drainage or saturated land.

Given site topography and ground conditions, surface water runoff would be expected to flow overland in a direction determined by local topography and slowly infiltrate where conditions allow.

The greenfield surface water runoff rates for the site, calculated using the ICP SUDS method within MicroDrainage are presented in **Table 1**. Details of the input parameters and the output results are provided in **Appendix B**.

**Table 1: Greenfield Runoff Rate**

| AEP of Rainfall Event | Greenfield Runoff Rate<br>(l/s/ha) |
|-----------------------|------------------------------------|
| 1 in 1                | 5.3                                |
| QBAR                  | 6.3                                |
| 1 in 30               | 11.1                               |
| 1 in 100              | 13.2                               |

### 6.2 Surface Water Drainage at the Developed Site

#### 6.2.1 Disposal of Surface Water

In accordance with the NPPG<sup>13</sup>, surface water runoff should be disposed of according to the following hierarchy: Into the ground (infiltration); To a surface water body; To a surface water sewer, highway drain, or another drainage system; To a combined sewer.

As stated in **Section 2.4**, infiltration testing has been undertaken within the BVF Phase. The results show that soakaways are unlikely to provide a suitable drainage solution for the discharge of surface water runoff. Based on ground conditions for the remainder of the site, including Land at Tithe House Way, the disposal of surface water via infiltration is unlikely to be feasible. In addition, the RES report indicates the topography of the site to have slopes greater than 1 in 10, and thus, the site is not considered suitable for infiltration due to the potential for re-emergence of flows lower down the slopes. Should areas of the site appear to be suitable for the use of soakaways, however, then infiltration tests may be undertaken at the detailed design stage in accordance with the guidelines in BRE365<sup>4</sup>.

It is proposed to direct all runoff from the developed site to existing watercourses and the culverted land drain (as illustrated in **Figure 8**).

#### 6.2.2 Post Development Impermeable Area

To facilitate the development of an illustrative drainage scheme, the proposed development has been subdivided into eight drainage areas (in addition to Parcels R and A), as illustrated in **Figure 8**. The drainage areas are based on the Areas Plan (**Appendix A**) and site topography.

<sup>13</sup> Paragraph 080, Reference ID: 7-080-20150323

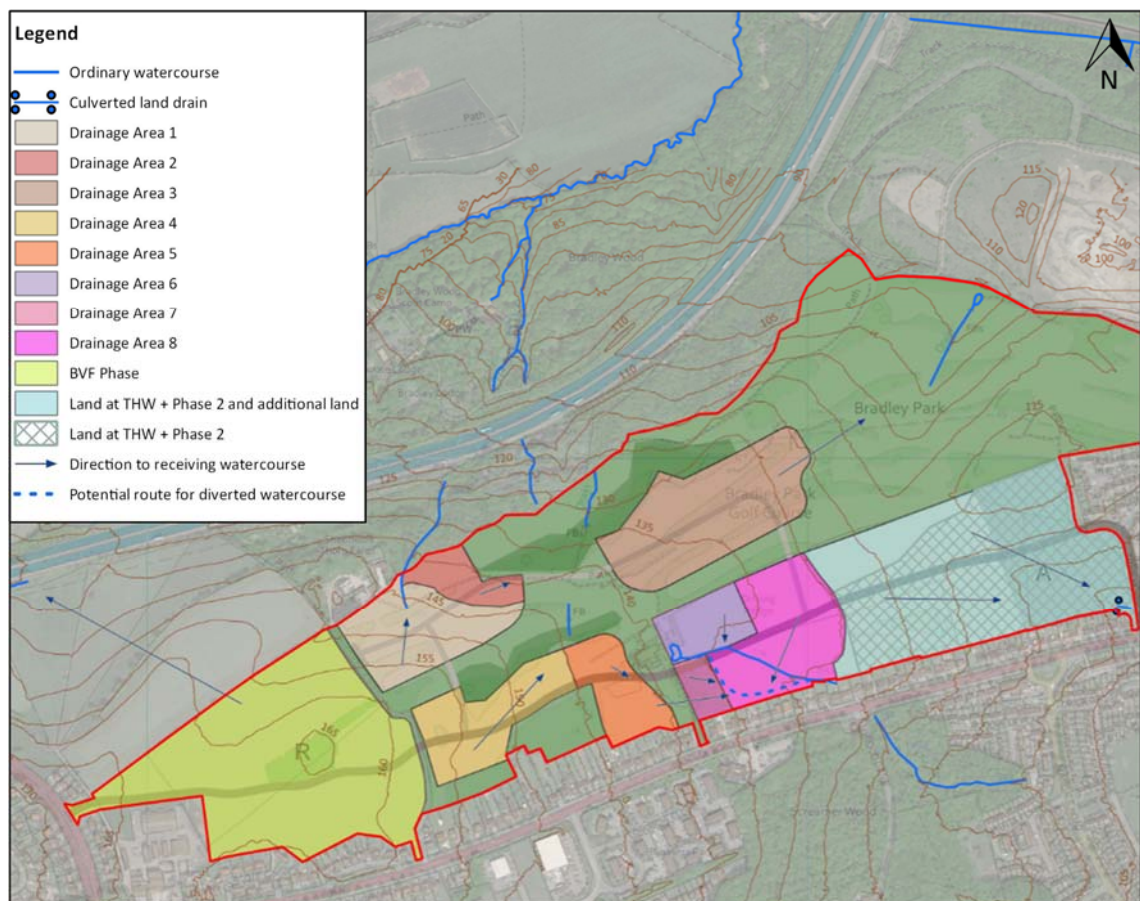
The area of impermeable surfaces at the site are estimated to be as follows:

- Residential areas: 55%
- Primary school: 65%
- Local centre: 90%

A breakdown of each drainage area and the estimated impermeable surfaces within each area are presented in **Table 2**.

For the BVF Phase and Land at Tithe House Way, the impermeable areas have been calculated to be 4.884 ha<sup>1</sup> and 2.020 ha<sup>2</sup> respectively.

It should be noted that land to the west of Land at Tithe House Way (referred to as 'Phase 2' in the FRDA report<sup>2</sup>) has an estimated impermeable area of 2.135 ha; however, the Phase 2 area would need to be increased based on the current Areas Plan (as shown in **Figure 8**) and therefore the estimated impermeable area for Phase 2 would increase to 3.134 ha.



**Figure 8: Indicative Drainage Areas**

### 6.2.3 Peak Flow Control

It is proposed to restrict surface water runoff within each drainage area to the existing greenfield QBAR rate of 6.3 l/s/ha post development. The peak runoff rate for each drainage area is presented in **Table 2**.

For the BVF Phase, a discharge rate of 22.0 l/s has been agreed with Kirklees Council.

For Land at Tithe House Way, a discharge rate of 13.5 l/s has been agreed with Kirklees Council. Phase 2 is also accounted for within the agreed discharge rate.

#### 6.2.4 Volume Control

Where reasonably practicable, for greenfield sites, the runoff volume from the proposed development to any highway drain, sewer or surface water body in the 1 in 100 AEP, 6 hour rainfall event should not exceed the greenfield runoff volume for the same event.

As outlined within the CIRIA SuDS Manual 2015 extra runoff volumes in extreme events may be managed by releasing all runoff (above the 1 in 1 AEP event) from the site at a maximum rate of 2 l/s/ha or QBAR, whichever is the higher value.

It is proposed to restrict peak discharge rates to the existing QBAR rate for drainage areas 1 – 8, 22.0 l/s for the BVF Phase and 13.5 l/s for Land at Tithe House Way (including land to the west) in up to the 1 in 100 annual probability event including an allowance for climate change. Therefore, the runoff volume will not exceed the greenfield runoff volume during the 1 in 100 AEP, 6 hour rainfall event.

#### 6.2.5 Attenuation Storage

Attenuation storage will be provided within each drainage area to store surface water runoff generated across roofs and hardstanding.

The attenuation storage facilities have been modelled using the Source Control module of MicroDrainage (**Appendix C**). The required storage volumes have been sized to store the 1 in 100 AEP rainfall event including a 30% increase in rainfall intensity to allow for climate change.

The storage volumes including the approximate land-takes required for each drainage area based on the peak runoff rates are provided in **Table 2**.

For residential areas (drainage areas 1-5 and 8) storage could be provided in above ground facilities such as attenuation basins filling to a depth of 1.0 m with a 0.3 m freeboard and a 1 in 3 side slope. For the primary school and local centre (drainage areas 6 and 7 respectively) storage could be provided in below ground facilities such as geo-cellular storage crates.

**Table 2: Impermeable Areas, Indicative Peak Runoff Rates, Storage Volumes and Land Take**

|                                                         | Drainage Area (DA) |       |       |       |       |       |       |       |
|---------------------------------------------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|
|                                                         | DA1                | DA2   | DA3   | DA4   | DA5   | DA6   | DA7   | DA8   |
| Development platform (ha)                               | 2.541              | 0.926 | 4.186 | 2.258 | 1.460 | 1.139 | 0.489 | 3.071 |
| Post development impermeable area (ha)                  | 1.397              | 0.509 | 2.302 | 1.242 | 0.803 | 0.740 | 0.440 | 1.689 |
| Proposed peak runoff rate (l/s)                         | 8.8                | 3.2   | 14.5  | 7.8   | 5.1   | 4.7   | 2.8   | 10.6  |
| Indicative attenuation storage volume (m <sup>3</sup> ) | 857                | 307   | 1426  | 760   | 487   | 450   | 274   | 1041  |
| Land take of above ground storage (m <sup>2</sup> )     | 1126               | 473   | 1763  | 1012  | 691   | -     | -     | 1332  |

Additional SuDS features, such as rainwater harvesting, bioretention areas, filter strips, swales or filter drains may be incorporated into the surface water drainage strategy at the detailed design stage. As detailed in the RES report, it may be feasible to utilise the existing drainage on the golf course once fully mapped and its condition understood.

It should be noted that the calculations assume that all storage is provided within the attenuation storage facilities; with no storage being provided in the proposed pipe network. As such, the volumes of storage presented are likely to be an overestimate.

For the BVF Phase, it is proposed to store surface water runoff generated from roofs and hardstanding within an attenuation tank up to the 1 in 2 AEP event with an offline attenuation basin providing storage for all rainfall events greater than the 1 in 2 AEP event and up to the 1 in 100 plus 30% climate change AEP event.

For Land at Tithe House Way, the FRDA report proposes that both Phases 1 and 2 will have their own storage facility to store surface water runoff, with the Phase 2 storage system cascading into the Phase 1 storage system prior to discharging into the culverted land drain at a restricted rate of 13.5 l/s.

#### 6.2.6 Exceedance Routes

Flows resulting from rainfall in excess of the 1 in 100 AEP plus climate change rainfall event will be managed in exceedance routes. It is assumed that as the development is constructed, exceedance flows would be directed towards carriageways and away from built development.

#### 6.2.7 Pollution Control

Kirklees Council requires that two levels of treatment be provided for new residential developments to reduce the risk of pollution to receiving waterbodies. SuDS features such as permeable paving across proposed driveways, filter strips or swales for the drainage of the proposed highways before outfalling into an attenuation basin may be incorporated into the design of the drainage systems.

Attenuation basins can provide water quality benefits via the settlement of pollutants in still or slow-moving water, adsorption by the soil, and biological activity. The potential for additional SuDS features to be utilised at the site would be investigated further at the detailed design stage.

#### 6.2.8 Adoption and Maintenance of SuDS

The pipe network, designed in accordance with the Design and Construction Guidance<sup>14</sup>, may be adopted by the sewerage undertaker.

SuDS elements within the curtilage of residential dwellings would be the responsibility of the owner of the property.

SuDS in open spaces may be maintained by a management company.

An indicative maintenance schedule is presented in **Table 3**.

**Table 3: Maintenance Requirements**

| Schedule                 | Required action                                                                                           | Frequency                                            |
|--------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>Attenuation Basin</b> |                                                                                                           |                                                      |
| Regular maintenance      | Remove litter and debris                                                                                  | Monthly                                              |
|                          | Cut grass                                                                                                 | Monthly during grow season<br>Or as required)        |
|                          | Manage other vegetation and remove nuisance plants                                                        | Monthly at start, then as required                   |
|                          | Inspect inlets, outlets and overflows for blockages, and clear if required.                               | Monthly                                              |
|                          | Inspect banksides, structures, pipework etc for evidence of physical damage                               | Monthly                                              |
|                          | Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies | Monthly for first year, then annually or as required |
|                          | Tidy all dead growth before start of growing season                                                       | Annually                                             |
|                          | Remove sediment from inlets/outlets                                                                       | Annually (or as required)                            |
|                          | Reseed areas of poor vegetation growth                                                                    | As required                                          |

<sup>14</sup> Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code"), Approved Version 2.0, 10 March 2020

| Schedule                              | Required action                                                                                    | Frequency                                                                                 |
|---------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Occasional maintenance                | Prune and trim any trees and remove cuttings                                                       | Every two years, or as required                                                           |
|                                       | Remove sediments from inlets/outlets and main basin when required                                  |                                                                                           |
| Remedial actions                      | Repair erosion or other damage by reseedling or re-turfing                                         | As required                                                                               |
|                                       | Realignment of rip-rap                                                                             |                                                                                           |
|                                       | Repair/rehabilitation of inlets/outlets                                                            |                                                                                           |
|                                       | Relevel uneven surface and reinstate design levels                                                 |                                                                                           |
| Geo-cellular Attenuation Storage Tank |                                                                                                    |                                                                                           |
| Regular maintenance                   | Inspect and identify any areas that are not operating correctly                                    | Monthly for 3 months, then annually                                                       |
|                                       | Remove debris from the catchment surface                                                           | Monthly                                                                                   |
|                                       | Remove sediment from internal forebays                                                             | Annually, or as required                                                                  |
| Remedial action                       | Repair inlet/outlet and vents                                                                      | As required                                                                               |
| Monitoring                            | Inspect catchpit manholes and note rate of sediment accumulation                                   | Monthly in the first year and then annually                                               |
|                                       | Inspect inlet/outlet and vents to ensure that they are in good condition and operating as designed | Annually                                                                                  |
|                                       | Survey inside of tank for sediment build-up and remove if necessary                                | Every 5 years, or as required                                                             |
| Flow Control Unit                     |                                                                                                    |                                                                                           |
| Routine maintenance                   | Remove litter and debris and inspect for sediment, oil and grease accumulation                     | Six Monthly                                                                               |
|                                       | Remove sediment, oil, grease and floatables                                                        | As necessary – Indicated by system inspections or immediately following significant spill |
| Remedial actions                      | Replace malfunctioning parts or structures                                                         | As required                                                                               |
| Monitoring                            | Inspect for evidence of poor operation                                                             | Six Monthly                                                                               |
|                                       | Inspect filter media and establish appropriate replacement frequencies                             | Six Monthly                                                                               |
|                                       | Inspect sediment accumulation rates and establish appropriate removal frequencies                  | Monthly during first year of operation, then every six months                             |

## 7 SUMMARY AND RECOMMENDATIONS

This report has been prepared on behalf of Redrow Homes (Yorkshire) Ltd, R. Kershaw and S. Gill and relates to the proposed development of land at Bradley Villa Farm, Bradley, Huddersfield.

According to the Environment Agency Flood Map for Planning the proposed development is located outside the 1 in 1,000 AEP flood outline and is therefore defined by the NPPF as being situated within flood zone 1.

As the site is in flood zone 1, the sequential test is deemed to have been addressed and the exception test need not be addressed.

The site is assessed not to be at risk of flooding from the Calder and Hebble Navigation, groundwater and reservoirs.

The Flood Map for Planning does not present flood outlines for watercourses with a catchment area less than 3.0 km<sup>2</sup>; In instances such as this, the Flood Risk from Surface Water map provides a useful proxy for fluvial flood risk.

The Flood Risk from Surface Water map indicates that the site is predominantly at Very Low risk of flooding from surface water. A small number of surface water flow paths are indicated to be present on-site, however, most of the flow paths coincide with the on-site watercourses and as such, the risk of flooding is assumed to be associated with the watercourses. The mapping indicates that land adjacent to the on-site watercourses are at Low risk of flooding during extreme events, and therefore, there may be some propensity for localised flooding from the on-site watercourses with flood depths predominately less than 300 mm.

A surface water flow path is indicated to be present in the south-eastern corner of the site where the natural contours of the land forms a shallow swale feature where overland flow would be directed. The risk and extent of surface water flow paths, however, are reduced during less extreme events.

This report has demonstrated that the proposed development may be completed in accordance with the requirements of planning policy subject to the following:

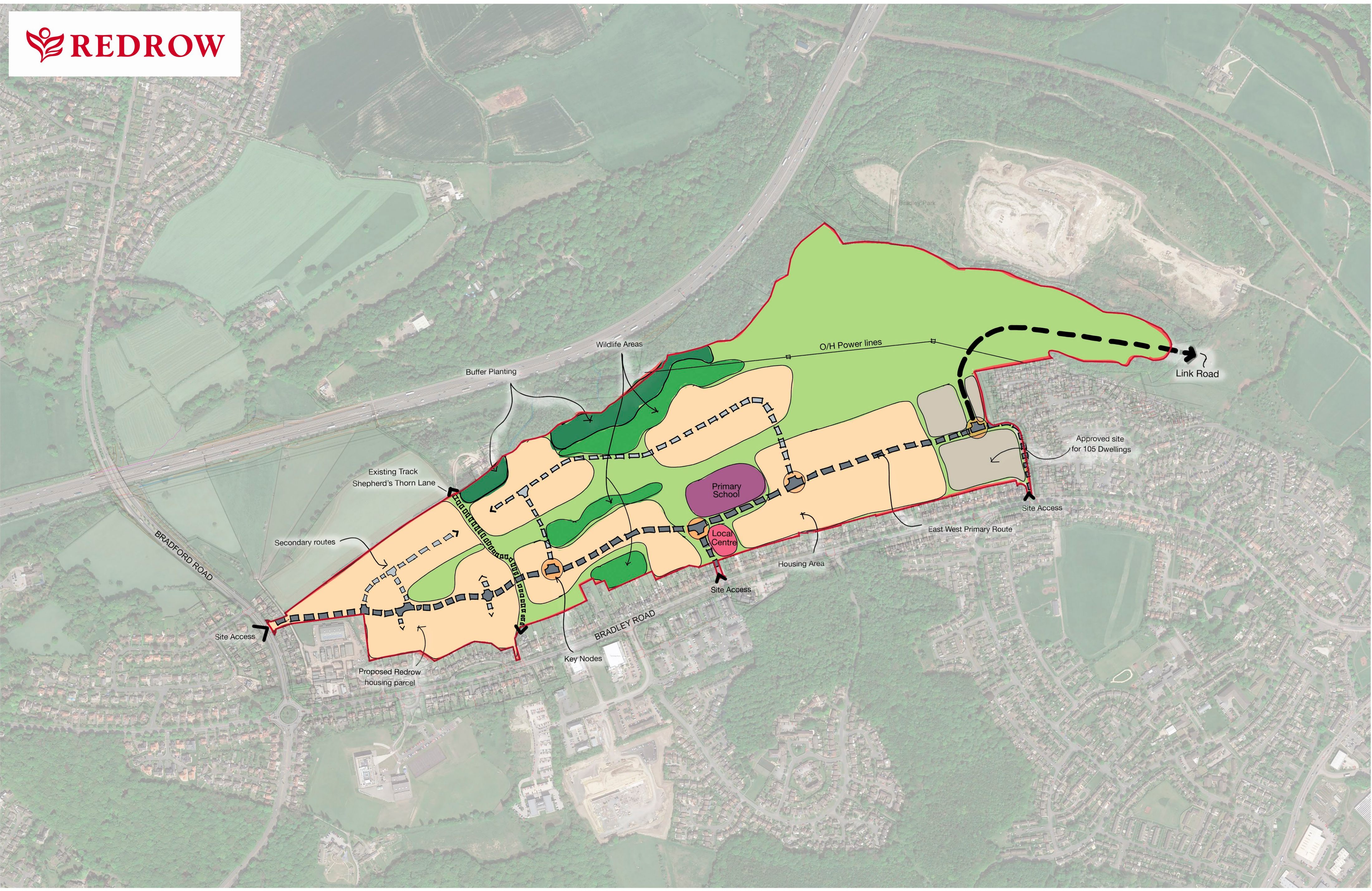
- Finished floor levels to be set 150 mm above adjacent ground levels following any re-profiling at the site
- New culverts and/or bridges along the course of Deep Dike and/or any unnamed watercourses should maintain existing channel conveyance capacity
- A channel maintenance regime to be implemented
- A surface water drainage system that accords with the broad principles presented in this report.

Surface water runoff from the developed site can be sustainably managed in accordance with planning policy and is not expected to impact flood risk elsewhere.

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## APPENDIX A

### Development Proposals



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## APPENDIX B

### Greenfield Runoff Rate

|                                                 |                                       |                                                                                     |
|-------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                        |                                       | Page 1                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB |                                       |  |
| Date 11/08/2020 13:04<br>File                   | Designed by KeelyBonser<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1              |                                       |                                                                                     |

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 956 Urban 0.000  
Area (ha) 1.000 Soil 0.450 Region Number Region 3

**Results 1/s**

QBAR Rural 6.3  
QBAR Urban 6.3

Q100 years 13.2

Q1 year 5.4  
Q30 years 11.1  
Q100 years 13.2

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## APPENDIX C

### Surface Water Attenuation - Storage Volume Calculation

|                                                             |                     |                                        |                             |                                                                                     |        |
|-------------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                    |                     |                                        |                             | Page 1                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB             |                     |                                        |                             |  |        |
| Date 12/11/2020 10:41<br>File 2020-11-12 4937 DA1 100...    |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                                |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+30%)</u> |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 15 min Summer                                               | 0.382               | 0.382                                  | 8.8                         | 292.7                                                                               | 0 K    |
| 30 min Summer                                               | 0.501               | 0.501                                  | 8.8                         | 392.8                                                                               | 0 K    |
| 60 min Summer                                               | 0.623               | 0.623                                  | 8.8                         | 499.8                                                                               | 0 K    |
| 120 min Summer                                              | 0.740               | 0.740                                  | 8.8                         | 606.7                                                                               | 0 K    |
| 180 min Summer                                              | 0.798               | 0.798                                  | 8.8                         | 661.3                                                                               | 0 K    |
| 240 min Summer                                              | 0.830               | 0.830                                  | 8.8                         | 692.5                                                                               | 0 K    |
| 360 min Summer                                              | 0.866               | 0.866                                  | 8.8                         | 727.0                                                                               | 0 K    |
| 480 min Summer                                              | 0.881               | 0.881                                  | 8.8                         | 741.7                                                                               | 0 K    |
| 600 min Summer                                              | 0.884               | 0.884                                  | 8.8                         | 745.0                                                                               | 0 K    |
| 720 min Summer                                              | 0.881               | 0.881                                  | 8.8                         | 741.5                                                                               | 0 K    |
| 960 min Summer                                              | 0.870               | 0.870                                  | 8.8                         | 731.1                                                                               | 0 K    |
| 1440 min Summer                                             | 0.841               | 0.841                                  | 8.8                         | 702.9                                                                               | 0 K    |
| 2160 min Summer                                             | 0.791               | 0.791                                  | 8.8                         | 654.5                                                                               | 0 K    |
| 2880 min Summer                                             | 0.737               | 0.737                                  | 8.8                         | 603.9                                                                               | 0 K    |
| 4320 min Summer                                             | 0.614               | 0.614                                  | 8.8                         | 491.6                                                                               | 0 K    |
| 5760 min Summer                                             | 0.498               | 0.498                                  | 8.8                         | 390.2                                                                               | 0 K    |
| 7200 min Summer                                             | 0.401               | 0.401                                  | 8.8                         | 308.3                                                                               | 0 K    |
| 8640 min Summer                                             | 0.323               | 0.323                                  | 8.8                         | 244.5                                                                               | 0 K    |
| 10080 min Summer                                            | 0.263               | 0.263                                  | 8.8                         | 196.7                                                                               | 0 K    |
| 15 min Winter                                               | 0.426               | 0.426                                  | 8.8                         | 328.6                                                                               | 0 K    |
| 30 min Winter                                               | 0.557               | 0.557                                  | 8.8                         | 441.4                                                                               | 0 K    |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 15 min Summer                                               | 114.680             | 0.0                                    | 288.7                       | 22                                                                                  |        |
| 30 min Summer                                               | 77.440              | 0.0                                    | 391.2                       | 36                                                                                  |        |
| 60 min Summer                                               | 49.937              | 0.0                                    | 517.1                       | 66                                                                                  |        |
| 120 min Summer                                              | 31.091              | 0.0                                    | 644.3                       | 124                                                                                 |        |
| 180 min Summer                                              | 23.207              | 0.0                                    | 721.5                       | 184                                                                                 |        |
| 240 min Summer                                              | 18.718              | 0.0                                    | 775.8                       | 244                                                                                 |        |
| 360 min Summer                                              | 13.796              | 0.0                                    | 857.3                       | 362                                                                                 |        |
| 480 min Summer                                              | 11.103              | 0.0                                    | 919.4                       | 482                                                                                 |        |
| 600 min Summer                                              | 9.374               | 0.0                                    | 969.5                       | 600                                                                                 |        |
| 720 min Summer                                              | 8.158               | 0.0                                    | 1011.5                      | 684                                                                                 |        |
| 960 min Summer                                              | 6.546               | 0.0                                    | 1079.3                      | 792                                                                                 |        |
| 1440 min Summer                                             | 4.790               | 0.0                                    | 1171.3                      | 1044                                                                                |        |
| 2160 min Summer                                             | 3.498               | 0.0                                    | 1314.8                      | 1468                                                                                |        |
| 2880 min Summer                                             | 2.794               | 0.0                                    | 1400.0                      | 1876                                                                                |        |
| 4320 min Summer                                             | 2.032               | 0.0                                    | 1525.5                      | 2680                                                                                |        |
| 5760 min Summer                                             | 1.619               | 0.0                                    | 1626.8                      | 3400                                                                                |        |
| 7200 min Summer                                             | 1.358               | 0.0                                    | 1704.3                      | 4104                                                                                |        |
| 8640 min Summer                                             | 1.177               | 0.0                                    | 1771.3                      | 4760                                                                                |        |
| 10080 min Summer                                            | 1.042               | 0.0                                    | 1828.1                      | 5448                                                                                |        |
| 15 min Winter                                               | 114.680             | 0.0                                    | 323.9                       | 22                                                                                  |        |
| 30 min Winter                                               | 77.440              | 0.0                                    | 438.1                       | 36                                                                                  |        |
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|                                                          |                     |                                        |                             |                                                                                     |        |
|----------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                 |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                     |                                        |                             |  |        |
| Date 12/11/2020 10:41<br>File 2020-11-12 4937 DA1 100... |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                             |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| Summary of Results for 100 year Return Period (+30%)     |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                           | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                            | 0.692               | 0.692                                  | 8.8                         | 562.7                                                                               | 0 K    |
| 120 min Winter                                           | 0.821               | 0.821                                  | 8.8                         | 683.5                                                                               | 0 K    |
| 180 min Winter                                           | 0.886               | 0.886                                  | 8.8                         | 746.7                                                                               | 0 K    |
| 240 min Winter                                           | 0.923               | 0.923                                  | 8.8                         | 783.8                                                                               | 0 K    |
| 360 min Winter                                           | 0.966               | 0.966                                  | 8.8                         | 826.9                                                                               | 0 K    |
| 480 min Winter                                           | 0.987               | 0.987                                  | 8.8                         | 848.2                                                                               | 0 K    |
| 600 min Winter                                           | 0.996               | 0.996                                  | 8.8                         | 856.6                                                                               | 0 K    |
| 720 min Winter                                           | 0.996               | 0.996                                  | 8.8                         | 857.0                                                                               | 0 K    |
| 960 min Winter                                           | 0.983               | 0.983                                  | 8.8                         | 843.5                                                                               | 0 K    |
| 1440 min Winter                                          | 0.945               | 0.945                                  | 8.8                         | 805.6                                                                               | 0 K    |
| 2160 min Winter                                          | 0.876               | 0.876                                  | 8.8                         | 737.1                                                                               | 0 K    |
| 2880 min Winter                                          | 0.799               | 0.799                                  | 8.8                         | 662.2                                                                               | 0 K    |
| 4320 min Winter                                          | 0.614               | 0.614                                  | 8.8                         | 491.3                                                                               | 0 K    |
| 5760 min Winter                                          | 0.435               | 0.435                                  | 8.8                         | 336.8                                                                               | 0 K    |
| 7200 min Winter                                          | 0.300               | 0.300                                  | 8.8                         | 225.9                                                                               | 0 K    |
| 8640 min Winter                                          | 0.211               | 0.211                                  | 8.6                         | 156.3                                                                               | 0 K    |
| 10080 min Winter                                         | 0.161               | 0.161                                  | 8.2                         | 117.7                                                                               | 0 K    |
| Storm<br>Event                                           | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                            | 49.937              | 0.0                                    | 579.4                       | 64                                                                                  |        |
| 120 min Winter                                           | 31.091              | 0.0                                    | 721.8                       | 122                                                                                 |        |
| 180 min Winter                                           | 23.207              | 0.0                                    | 808.1                       | 180                                                                                 |        |
| 240 min Winter                                           | 18.718              | 0.0                                    | 868.7                       | 240                                                                                 |        |
| 360 min Winter                                           | 13.796              | 0.0                                    | 959.6                       | 354                                                                                 |        |
| 480 min Winter                                           | 11.103              | 0.0                                    | 1028.7                      | 468                                                                                 |        |
| 600 min Winter                                           | 9.374               | 0.0                                    | 1084.1                      | 580                                                                                 |        |
| 720 min Winter                                           | 8.158               | 0.0                                    | 1130.2                      | 690                                                                                 |        |
| 960 min Winter                                           | 6.546               | 0.0                                    | 1203.2                      | 894                                                                                 |        |
| 1440 min Winter                                          | 4.790               | 0.0                                    | 1282.9                      | 1112                                                                                |        |
| 2160 min Winter                                          | 3.498               | 0.0                                    | 1472.7                      | 1580                                                                                |        |
| 2880 min Winter                                          | 2.794               | 0.0                                    | 1568.1                      | 2044                                                                                |        |
| 4320 min Winter                                          | 2.032               | 0.0                                    | 1709.0                      | 2896                                                                                |        |
| 5760 min Winter                                          | 1.619               | 0.0                                    | 1822.3                      | 3576                                                                                |        |
| 7200 min Winter                                          | 1.358               | 0.0                                    | 1909.2                      | 4184                                                                                |        |
| 8640 min Winter                                          | 1.177               | 0.0                                    | 1984.4                      | 4760                                                                                |        |
| 10080 min Winter                                         | 1.042               | 0.0                                    | 2048.7                      | 5344                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 10:41<br>File 2020-11-12 4937 DA1 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions                                             |                                        |                                                                                     |
| Source Control 2020.1                                    |                                        |                                                                                     |

### Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

### Time Area Diagram

Total Area (ha) 1.397

| Time (mins)    | Area | Time (mins)    | Area |
|----------------|------|----------------|------|
| From: To: (ha) |      | From: To: (ha) |      |
| 0 4 1.000      |      | 4 8 0.397      |      |

|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 10:41<br>File 2020-11-12 4937 DA1 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions                                             | Source Control 2020.1                  |                                                                                     |

### Model Details

Storage is Online Cover Level (m) 1.300

### Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 710.0                  | 1.300     | 1126.2                 |

### Hydro-Brake® Optimum Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0137-8800-1000-8800 |
| Design Head (m)                   | 1.000                      |
| Design Flow (l/s)                 | 8.8                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 137                        |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 150                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 8.8        |
| Flush-Flo™                | 0.299    | 8.8        |
| Kick-Flo®                 | 0.664    | 7.3        |
| Mean Flow over Head Range | -        | 7.6        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 5.0        | 1.200     | 9.6        | 3.000     | 14.8       | 7.000     | 22.2       |
| 0.200     | 8.5        | 1.400     | 10.3       | 3.500     | 15.9       | 7.500     | 22.9       |
| 0.300     | 8.8        | 1.600     | 11.0       | 4.000     | 17.0       | 8.000     | 23.7       |
| 0.400     | 8.7        | 1.800     | 11.6       | 4.500     | 18.0       | 8.500     | 24.4       |
| 0.500     | 8.4        | 2.000     | 12.2       | 5.000     | 18.9       | 9.000     | 25.0       |
| 0.600     | 7.9        | 2.200     | 12.8       | 5.500     | 19.8       | 9.500     | 25.7       |
| 0.800     | 7.9        | 2.400     | 13.3       | 6.000     | 20.6       |           |            |
| 1.000     | 8.8        | 2.600     | 13.8       | 6.500     | 21.4       |           |            |

|                                                      |                     |                           |                             |                                                                                     |        |
|------------------------------------------------------|---------------------|---------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                             |                     |                           |                             | Page 1                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB      |                     |                           |                             |  |        |
| Date 12/11/2020 10:48                                |                     | Designed by MichaelDarby  |                             |                                                                                     |        |
| File 2020-11-12 4937 DA2 100...                      |                     | Checked by                |                             |                                                                                     |        |
| XP Solutions                                         |                     | Source Control 2020.1     |                             |                                                                                     |        |
| Summary of Results for 100 year Return Period (+30%) |                     |                           |                             |                                                                                     |        |
| Storm<br>Event                                       | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 15 min Summer                                        | 0.420               | 0.420                     | 3.2                         | 107.0                                                                               | O K    |
| 30 min Summer                                        | 0.540               | 0.540                     | 3.2                         | 143.3                                                                               | O K    |
| 60 min Summer                                        | 0.659               | 0.659                     | 3.2                         | 182.1                                                                               | O K    |
| 120 min Summer                                       | 0.768               | 0.768                     | 3.2                         | 219.8                                                                               | O K    |
| 180 min Summer                                       | 0.821               | 0.821                     | 3.2                         | 239.0                                                                               | O K    |
| 240 min Summer                                       | 0.850               | 0.850                     | 3.2                         | 249.7                                                                               | O K    |
| 360 min Summer                                       | 0.880               | 0.880                     | 3.2                         | 261.1                                                                               | O K    |
| 480 min Summer                                       | 0.892               | 0.892                     | 3.2                         | 265.5                                                                               | O K    |
| 600 min Summer                                       | 0.892               | 0.892                     | 3.2                         | 265.8                                                                               | O K    |
| 720 min Summer                                       | 0.887               | 0.887                     | 3.2                         | 263.8                                                                               | O K    |
| 960 min Summer                                       | 0.874               | 0.874                     | 3.2                         | 258.7                                                                               | O K    |
| 1440 min Summer                                      | 0.843               | 0.843                     | 3.2                         | 247.1                                                                               | O K    |
| 2160 min Summer                                      | 0.794               | 0.794                     | 3.2                         | 229.1                                                                               | O K    |
| 2880 min Summer                                      | 0.744               | 0.744                     | 3.2                         | 211.1                                                                               | O K    |
| 4320 min Summer                                      | 0.635               | 0.635                     | 3.2                         | 174.0                                                                               | O K    |
| 5760 min Summer                                      | 0.508               | 0.508                     | 3.2                         | 133.3                                                                               | O K    |
| 7200 min Summer                                      | 0.405               | 0.405                     | 3.2                         | 102.5                                                                               | O K    |
| 8640 min Summer                                      | 0.321               | 0.321                     | 3.2                         | 79.1                                                                                | O K    |
| 10080 min Summer                                     | 0.257               | 0.257                     | 3.2                         | 61.8                                                                                | O K    |
| 15 min Winter                                        | 0.464               | 0.464                     | 3.2                         | 120.1                                                                               | O K    |
| 30 min Winter                                        | 0.596               | 0.596                     | 3.2                         | 161.1                                                                               | O K    |
| Storm<br>Event                                       | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 15 min Summer                                        | 114.680             | 0.0                       | 107.8                       | 19                                                                                  |        |
| 30 min Summer                                        | 77.440              | 0.0                       | 145.7                       | 34                                                                                  |        |
| 60 min Summer                                        | 49.937              | 0.0                       | 189.8                       | 64                                                                                  |        |
| 120 min Summer                                       | 31.091              | 0.0                       | 236.4                       | 122                                                                                 |        |
| 180 min Summer                                       | 23.207              | 0.0                       | 264.7                       | 182                                                                                 |        |
| 240 min Summer                                       | 18.718              | 0.0                       | 284.7                       | 242                                                                                 |        |
| 360 min Summer                                       | 13.796              | 0.0                       | 314.7                       | 362                                                                                 |        |
| 480 min Summer                                       | 11.103              | 0.0                       | 337.6                       | 480                                                                                 |        |
| 600 min Summer                                       | 9.374               | 0.0                       | 356.1                       | 600                                                                                 |        |
| 720 min Summer                                       | 8.158               | 0.0                       | 371.7                       | 684                                                                                 |        |
| 960 min Summer                                       | 6.546               | 0.0                       | 397.2                       | 790                                                                                 |        |
| 1440 min Summer                                      | 4.790               | 0.0                       | 433.4                       | 1042                                                                                |        |
| 2160 min Summer                                      | 3.498               | 0.0                       | 480.1                       | 1468                                                                                |        |
| 2880 min Summer                                      | 2.794               | 0.0                       | 511.4                       | 1876                                                                                |        |
| 4320 min Summer                                      | 2.032               | 0.0                       | 557.6                       | 2720                                                                                |        |
| 5760 min Summer                                      | 1.619               | 0.0                       | 593.2                       | 3408                                                                                |        |
| 7200 min Summer                                      | 1.358               | 0.0                       | 621.6                       | 4104                                                                                |        |
| 8640 min Summer                                      | 1.177               | 0.0                       | 646.3                       | 4760                                                                                |        |
| 10080 min Summer                                     | 1.042               | 0.0                       | 667.6                       | 5448                                                                                |        |
| 15 min Winter                                        | 114.680             | 0.0                       | 120.8                       | 19                                                                                  |        |
| 30 min Winter                                        | 77.440              | 0.0                       | 163.1                       | 33                                                                                  |        |
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|                                                             |                     |                                        |                             |                                                                                     |        |
|-------------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                    |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB             |                     |                                        |                             |  |        |
| Date 12/11/2020 10:48<br>File 2020-11-12 4937 DA2 100...    |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                                |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+30%)</u> |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                               | 0.726               | 0.726                                  | 3.2                         | 204.8                                                                               | O K    |
| 120 min Winter                                              | 0.845               | 0.845                                  | 3.2                         | 248.0                                                                               | O K    |
| 180 min Winter                                              | 0.904               | 0.904                                  | 3.2                         | 270.4                                                                               | O K    |
| 240 min Winter                                              | 0.938               | 0.938                                  | 3.2                         | 283.4                                                                               | O K    |
| 360 min Winter                                              | 0.975               | 0.975                                  | 3.2                         | 298.2                                                                               | O K    |
| 480 min Winter                                              | 0.992               | 0.992                                  | 3.2                         | 305.2                                                                               | O K    |
| 600 min Winter                                              | 0.998               | 0.998                                  | 3.2                         | 307.5                                                                               | O K    |
| 720 min Winter                                              | 0.997               | 0.997                                  | 3.2                         | 307.0                                                                               | O K    |
| 960 min Winter                                              | 0.982               | 0.982                                  | 3.2                         | 300.9                                                                               | O K    |
| 1440 min Winter                                             | 0.943               | 0.943                                  | 3.2                         | 285.5                                                                               | O K    |
| 2160 min Winter                                             | 0.876               | 0.876                                  | 3.2                         | 259.8                                                                               | O K    |
| 2880 min Winter                                             | 0.804               | 0.804                                  | 3.2                         | 232.7                                                                               | O K    |
| 4320 min Winter                                             | 0.641               | 0.641                                  | 3.2                         | 175.9                                                                               | O K    |
| 5760 min Winter                                             | 0.442               | 0.442                                  | 3.2                         | 113.5                                                                               | O K    |
| 7200 min Winter                                             | 0.298               | 0.298                                  | 3.2                         | 72.9                                                                                | O K    |
| 8640 min Winter                                             | 0.203               | 0.203                                  | 3.1                         | 48.1                                                                                | O K    |
| 10080 min Winter                                            | 0.146               | 0.146                                  | 2.9                         | 33.8                                                                                | O K    |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                               | 49.937              | 0.0                                    | 212.6                       | 62                                                                                  |        |
| 120 min Winter                                              | 31.091              | 0.0                                    | 264.8                       | 122                                                                                 |        |
| 180 min Winter                                              | 23.207              | 0.0                                    | 296.5                       | 180                                                                                 |        |
| 240 min Winter                                              | 18.718              | 0.0                                    | 318.8                       | 238                                                                                 |        |
| 360 min Winter                                              | 13.796              | 0.0                                    | 352.3                       | 354                                                                                 |        |
| 480 min Winter                                              | 11.103              | 0.0                                    | 377.9                       | 468                                                                                 |        |
| 600 min Winter                                              | 9.374               | 0.0                                    | 398.5                       | 578                                                                                 |        |
| 720 min Winter                                              | 8.158               | 0.0                                    | 415.8                       | 688                                                                                 |        |
| 960 min Winter                                              | 6.546               | 0.0                                    | 443.7                       | 894                                                                                 |        |
| 1440 min Winter                                             | 4.790               | 0.0                                    | 474.7                       | 1112                                                                                |        |
| 2160 min Winter                                             | 3.498               | 0.0                                    | 537.8                       | 1580                                                                                |        |
| 2880 min Winter                                             | 2.794               | 0.0                                    | 572.7                       | 2044                                                                                |        |
| 4320 min Winter                                             | 2.032               | 0.0                                    | 624.6                       | 2940                                                                                |        |
| 5760 min Winter                                             | 1.619               | 0.0                                    | 664.4                       | 3576                                                                                |        |
| 7200 min Winter                                             | 1.358               | 0.0                                    | 696.3                       | 4184                                                                                |        |
| 8640 min Winter                                             | 1.177               | 0.0                                    | 723.9                       | 4840                                                                                |        |
| 10080 min Winter                                            | 1.042               | 0.0                                    | 747.9                       | 5440                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 10:48<br>File 2020-11-12 4937 DA2 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 0.509

| Time (mins) |     | Area  |
|-------------|-----|-------|
| From:       | To: | (ha)  |
| 0           | 4   | 0.509 |

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| Weetwood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        | Page 4                                                                              |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|------------|-----------|------------|-----------|------------|-------|-------|-------|--|----------|------------|---------------------------|-------|-----|------------|-------|-----|-----------|-------|-----|---------------------------|---|-----|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|--|--|-------|-----|-------|-----|-------|-----|--|--|
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |  |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Date 12/11/2020 10:48<br>File 2020-11-12 4937 DA2 100...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Designed by MichaelDarby<br>Checked by |                                                                                     |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |                                                                                     |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Source Control 2020.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        |                                                                                     |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 1.300</div> <div>Tank or Pond Structure</div> <div>Invert Level (m) 0.000</div> <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>220.0</td><td>1.300</td><td>472.8</td></tr></tbody></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0085-3200-1000-3200</div> <div>Design Head (m) 1.000</div> <div>Design Flow (l/s) 3.2</div> <div>Flush-Flo™ Calculated</div> <div>Objective Minimise upstream storage</div> <div>Application Surface</div> <div>Sump Available Yes</div> <div>Diameter (mm) 85</div> <div>Invert Level (m) 0.000</div> <div>Minimum Outlet Pipe Diameter (mm) 100</div> <div>Suggested Manhole Diameter (mm) 1200</div> <div>Control Points</div> <table><thead><tr><th></th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.000</td><td>3.2</td></tr><tr><td>Flush-Flo™</td><td>0.296</td><td>3.2</td></tr><tr><td>Kick-Flo®</td><td>0.624</td><td>2.6</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>2.8</td></tr></tbody></table> <div>The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated</div> <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>2.6</td><td>1.200</td><td>3.5</td><td>3.000</td><td>5.3</td><td>7.000</td><td>7.9</td></tr><tr><td>0.200</td><td>3.1</td><td>1.400</td><td>3.7</td><td>3.500</td><td>5.7</td><td>7.500</td><td>8.2</td></tr><tr><td>0.300</td><td>3.2</td><td>1.600</td><td>4.0</td><td>4.000</td><td>6.1</td><td>8.000</td><td>8.5</td></tr><tr><td>0.400</td><td>3.1</td><td>1.800</td><td>4.2</td><td>4.500</td><td>6.4</td><td>8.500</td><td>8.7</td></tr><tr><td>0.500</td><td>3.0</td><td>2.000</td><td>4.4</td><td>5.000</td><td>6.8</td><td>9.000</td><td>8.9</td></tr><tr><td>0.600</td><td>2.7</td><td>2.200</td><td>4.6</td><td>5.500</td><td>7.1</td><td>9.500</td><td>9.2</td></tr><tr><td>0.800</td><td>2.9</td><td>2.400</td><td>4.8</td><td>6.000</td><td>7.4</td><td></td><td></td></tr><tr><td>1.000</td><td>3.2</td><td>2.600</td><td>5.0</td><td>6.500</td><td>7.7</td><td></td><td></td></tr></tbody></table> |                                        |                                                                                     | Depth (m)  | Area (m²) | Depth (m)  | Area (m²) | 0.000      | 220.0 | 1.300 | 472.8 |  | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.000 | 3.2 | Flush-Flo™ | 0.296 | 3.2 | Kick-Flo® | 0.624 | 2.6 | Mean Flow over Head Range | - | 2.8 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 2.6 | 1.200 | 3.5 | 3.000 | 5.3 | 7.000 | 7.9 | 0.200 | 3.1 | 1.400 | 3.7 | 3.500 | 5.7 | 7.500 | 8.2 | 0.300 | 3.2 | 1.600 | 4.0 | 4.000 | 6.1 | 8.000 | 8.5 | 0.400 | 3.1 | 1.800 | 4.2 | 4.500 | 6.4 | 8.500 | 8.7 | 0.500 | 3.0 | 2.000 | 4.4 | 5.000 | 6.8 | 9.000 | 8.9 | 0.600 | 2.7 | 2.200 | 4.6 | 5.500 | 7.1 | 9.500 | 9.2 | 0.800 | 2.9 | 2.400 | 4.8 | 6.000 | 7.4 |  |  | 1.000 | 3.2 | 2.600 | 5.0 | 6.500 | 7.7 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Area (m²)                              | Depth (m)                                                                           | Area (m²)  |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 220.0                                  | 1.300                                                                               | 472.8      |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Head (m)                               | Flow (l/s)                                                                          |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.000                                  | 3.2                                                                                 |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.296                                  | 3.2                                                                                 |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.624                                  | 2.6                                                                                 |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -                                      | 2.8                                                                                 |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Flow (l/s)                             | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.6                                    | 1.200                                                                               | 3.5        | 3.000     | 5.3        | 7.000     | 7.9        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.1                                    | 1.400                                                                               | 3.7        | 3.500     | 5.7        | 7.500     | 8.2        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.2                                    | 1.600                                                                               | 4.0        | 4.000     | 6.1        | 8.000     | 8.5        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.1                                    | 1.800                                                                               | 4.2        | 4.500     | 6.4        | 8.500     | 8.7        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.0                                    | 2.000                                                                               | 4.4        | 5.000     | 6.8        | 9.000     | 8.9        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.7                                    | 2.200                                                                               | 4.6        | 5.500     | 7.1        | 9.500     | 9.2        |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.9                                    | 2.400                                                                               | 4.8        | 6.000     | 7.4        |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.2                                    | 2.600                                                                               | 5.0        | 6.500     | 7.7        |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                                                                                     |            |           |            |           |            |       |       |       |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |

| Weetwood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                           |                             | Page 1                                                                              |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
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| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                           |                             |  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
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| File 2020-11-12 4937 DA3 100...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     | Checked by                |                             |                                                                                     |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     | Source Control 2020.1     |                             |                                                                                     |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| <div>Summary of Results for 100 year Return Period (+30%)</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                           |                             |                                                                                     |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| <table><thead><tr><th>Storm<br/>Event</th><th>Max<br/>Level<br/>(m)</th><th>Max<br/>Depth<br/>(m)</th><th>Max<br/>Control<br/>(l/s)</th><th>Max<br/>Volume<br/>(m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.370</td><td>0.370</td><td>14.4</td><td>480.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.489</td><td>0.489</td><td>14.4</td><td>646.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.611</td><td>0.611</td><td>14.4</td><td>823.6</td><td>O K</td></tr><tr><td>120 min Summer</td><td>0.730</td><td>0.730</td><td>14.4</td><td>1001.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>0.791</td><td>0.791</td><td>14.4</td><td>1093.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>0.825</td><td>0.825</td><td>14.4</td><td>1147.0</td><td>O K</td></tr><tr><td>360 min Summer</td><td>0.863</td><td>0.863</td><td>14.4</td><td>1207.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.881</td><td>0.881</td><td>14.4</td><td>1234.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.886</td><td>0.886</td><td>14.4</td><td>1242.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.883</td><td>0.883</td><td>14.4</td><td>1238.6</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.875</td><td>0.875</td><td>14.4</td><td>1225.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.848</td><td>0.848</td><td>14.4</td><td>1183.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.799</td><td>0.799</td><td>14.4</td><td>1105.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.744</td><td>0.744</td><td>14.4</td><td>1022.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.620</td><td>0.620</td><td>14.4</td><td>836.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.509</td><td>0.509</td><td>14.4</td><td>675.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.415</td><td>0.415</td><td>14.4</td><td>542.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.339</td><td>0.339</td><td>14.4</td><td>438.9</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.281</td><td>0.281</td><td>14.4</td><td>360.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.413</td><td>0.413</td><td>14.4</td><td>540.0</td><td>O K</td></tr><tr><td>30 min Winter</td><td>0.544</td><td>0.544</td><td>14.4</td><td>726.4</td><td>O K</td></tr></tbody></table> |                     |                           |                             |                                                                                     |        | Storm<br>Event | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³) | Status        | 15 min Summer | 0.370 | 0.370 | 14.4 | 480.9         | O K    | 30 min Summer | 0.489 | 0.489 | 14.4          | 646.5  | O K | 60 min Summer | 0.611 | 0.611          | 14.4   | 823.6 | O K    | 120 min Summer | 0.730          | 0.730  | 14.4 | 1001.5 | O K | 180 min Summer | 0.791  | 0.791 | 14.4   | 1093.9 | O K            | 240 min Summer | 0.825 | 0.825  | 14.4 | 1147.0         | O K    | 360 min Summer | 0.863  | 0.863 | 14.4           | 1207.0 | O K | 480 min Summer | 0.881 | 0.881          | 14.4  | 1234.3 | O K    | 600 min Summer | 0.886          | 0.886 | 14.4 | 1242.1 | O K | 720 min Summer  | 0.883 | 0.883 | 14.4   | 1238.6 | O K             | 960 min Summer | 0.875 | 0.875  | 14.4 | 1225.0          | O K   | 1440 min Summer | 0.848  | 0.848 | 14.4            | 1183.3 | O K | 2160 min Summer | 0.799 | 0.799           | 14.4  | 1105.9 | O K    | 2880 min Summer | 0.744           | 0.744 | 14.4 | 1022.1 | O K  | 4320 min Summer | 0.620 | 0.620 | 14.4   | 836.2 | O K              | 5760 min Summer | 0.509 | 0.509  | 14.4 | 675.4         | O K     | 7200 min Summer | 0.415 | 0.415 | 14.4          | 542.9  | O K | 8640 min Summer | 0.339 | 0.339 | 14.4 | 438.9 | O K | 10080 min Summer | 0.281 | 0.281 | 14.4 | 360.3 | O K | 15 min Winter | 0.413 | 0.413 | 14.4 | 540.0 | O K | 30 min Winter | 0.544 | 0.544 | 14.4 | 726.4 | O K |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.370               | 0.370                     | 14.4                        | 480.9                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.489               | 0.489                     | 14.4                        | 646.5                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.611               | 0.611                     | 14.4                        | 823.6                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.730               | 0.730                     | 14.4                        | 1001.5                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.791               | 0.791                     | 14.4                        | 1093.9                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.825               | 0.825                     | 14.4                        | 1147.0                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.863               | 0.863                     | 14.4                        | 1207.0                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.881               | 0.881                     | 14.4                        | 1234.3                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.886               | 0.886                     | 14.4                        | 1242.1                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.883               | 0.883                     | 14.4                        | 1238.6                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.875               | 0.875                     | 14.4                        | 1225.0                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.848               | 0.848                     | 14.4                        | 1183.3                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.799               | 0.799                     | 14.4                        | 1105.9                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.744               | 0.744                     | 14.4                        | 1022.1                                                                              | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.620               | 0.620                     | 14.4                        | 836.2                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.509               | 0.509                     | 14.4                        | 675.4                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.415               | 0.415                     | 14.4                        | 542.9                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.339               | 0.339                     | 14.4                        | 438.9                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.281               | 0.281                     | 14.4                        | 360.3                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.413               | 0.413                     | 14.4                        | 540.0                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 30 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.544               | 0.544                     | 14.4                        | 726.4                                                                               | O K    |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| <table><thead><tr><th>Storm<br/>Event</th><th>Rain<br/>(mm/hr)</th><th>Flooded<br/>Volume<br/>(m³)</th><th>Discharge<br/>Volume<br/>(m³)</th><th>Time-Peak<br/>(mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>114.680</td><td>0.0</td><td>465.6</td><td>25</td></tr><tr><td>30 min Summer</td><td>77.440</td><td>0.0</td><td>632.8</td><td>39</td></tr><tr><td>60 min Summer</td><td>49.937</td><td>0.0</td><td>846.4</td><td>68</td></tr><tr><td>120 min Summer</td><td>31.091</td><td>0.0</td><td>1055.3</td><td>126</td></tr><tr><td>180 min Summer</td><td>23.207</td><td>0.0</td><td>1181.7</td><td>186</td></tr><tr><td>240 min Summer</td><td>18.718</td><td>0.0</td><td>1270.7</td><td>246</td></tr><tr><td>360 min Summer</td><td>13.796</td><td>0.0</td><td>1404.0</td><td>364</td></tr><tr><td>480 min Summer</td><td>11.103</td><td>0.0</td><td>1505.3</td><td>482</td></tr><tr><td>600 min Summer</td><td>9.374</td><td>0.0</td><td>1586.7</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.158</td><td>0.0</td><td>1654.8</td><td>684</td></tr><tr><td>960 min Summer</td><td>6.546</td><td>0.0</td><td>1763.9</td><td>794</td></tr><tr><td>1440 min Summer</td><td>4.790</td><td>0.0</td><td>1908.5</td><td>1046</td></tr><tr><td>2160 min Summer</td><td>3.498</td><td>0.0</td><td>2162.1</td><td>1468</td></tr><tr><td>2880 min Summer</td><td>2.794</td><td>0.0</td><td>2301.9</td><td>1876</td></tr><tr><td>4320 min Summer</td><td>2.032</td><td>0.0</td><td>2506.6</td><td>2644</td></tr><tr><td>5760 min Summer</td><td>1.619</td><td>0.0</td><td>2678.6</td><td>3400</td></tr><tr><td>7200 min Summer</td><td>1.358</td><td>0.0</td><td>2805.8</td><td>4104</td></tr><tr><td>8640 min Summer</td><td>1.177</td><td>0.0</td><td>2915.1</td><td>4760</td></tr><tr><td>10080 min Summer</td><td>1.042</td><td>0.0</td><td>3006.4</td><td>5448</td></tr><tr><td>15 min Winter</td><td>114.680</td><td>0.0</td><td>523.2</td><td>25</td></tr><tr><td>30 min Winter</td><td>77.440</td><td>0.0</td><td>709.1</td><td>39</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                     |                     |                           |                             |                                                                                     |        | Storm<br>Event | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)   | 15 min Summer | 114.680       | 0.0   | 465.6 | 25   | 30 min Summer | 77.440 | 0.0           | 632.8 | 39    | 60 min Summer | 49.937 | 0.0 | 846.4         | 68    | 120 min Summer | 31.091 | 0.0   | 1055.3 | 126            | 180 min Summer | 23.207 | 0.0  | 1181.7 | 186 | 240 min Summer | 18.718 | 0.0   | 1270.7 | 246    | 360 min Summer | 13.796         | 0.0   | 1404.0 | 364  | 480 min Summer | 11.103 | 0.0            | 1505.3 | 482   | 600 min Summer | 9.374  | 0.0 | 1586.7         | 600   | 720 min Summer | 8.158 | 0.0    | 1654.8 | 684            | 960 min Summer | 6.546 | 0.0  | 1763.9 | 794 | 1440 min Summer | 4.790 | 0.0   | 1908.5 | 1046   | 2160 min Summer | 3.498          | 0.0   | 2162.1 | 1468 | 2880 min Summer | 2.794 | 0.0             | 2301.9 | 1876  | 4320 min Summer | 2.032  | 0.0 | 2506.6          | 2644  | 5760 min Summer | 1.619 | 0.0    | 2678.6 | 3400            | 7200 min Summer | 1.358 | 0.0  | 2805.8 | 4104 | 8640 min Summer | 1.177 | 0.0   | 2915.1 | 4760  | 10080 min Summer | 1.042           | 0.0   | 3006.4 | 5448 | 15 min Winter | 114.680 | 0.0             | 523.2 | 25    | 30 min Winter | 77.440 | 0.0 | 709.1           | 39    |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 114.680             | 0.0                       | 465.6                       | 25                                                                                  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 77.440              | 0.0                       | 632.8                       | 39                                                                                  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 49.937              | 0.0                       | 846.4                       | 68                                                                                  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 31.091              | 0.0                       | 1055.3                      | 126                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 23.207              | 0.0                       | 1181.7                      | 186                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 18.718              | 0.0                       | 1270.7                      | 246                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 13.796              | 0.0                       | 1404.0                      | 364                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 11.103              | 0.0                       | 1505.3                      | 482                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9.374               | 0.0                       | 1586.7                      | 600                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8.158               | 0.0                       | 1654.8                      | 684                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6.546               | 0.0                       | 1763.9                      | 794                                                                                 |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4.790               | 0.0                       | 1908.5                      | 1046                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.498               | 0.0                       | 2162.1                      | 1468                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.794               | 0.0                       | 2301.9                      | 1876                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.032               | 0.0                       | 2506.6                      | 2644                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.619               | 0.0                       | 2678.6                      | 3400                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.358               | 0.0                       | 2805.8                      | 4104                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.177               | 0.0                       | 2915.1                      | 4760                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.042               | 0.0                       | 3006.4                      | 5448                                                                                |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 114.680             | 0.0                       | 523.2                       | 25                                                                                  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
| 30 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 77.440              | 0.0                       | 709.1                       | 39                                                                                  |        |                |                     |                           |                             |                       |               |               |       |       |      |               |        |               |       |       |               |        |     |               |       |                |        |       |        |                |                |        |      |        |     |                |        |       |        |        |                |                |       |        |      |                |        |                |        |       |                |        |     |                |       |                |       |        |        |                |                |       |      |        |     |                 |       |       |        |        |                 |                |       |        |      |                 |       |                 |        |       |                 |        |     |                 |       |                 |       |        |        |                 |                 |       |      |        |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |      |       |     |                  |       |       |      |       |     |               |       |       |      |       |     |               |       |       |      |       |     |
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|                                                             |                     |                                        |                             |                                                                                     |        |
|-------------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                    |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB             |                     |                                        |                             |  |        |
| Date 12/11/2020 11:00<br>File 2020-11-12 4937 DA3 100...    |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                                |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+30%)</u> |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                               | 0.681               | 0.681                                  | 14.4                        | 926.8                                                                               | O K    |
| 120 min Winter                                              | 0.813               | 0.813                                  | 14.4                        | 1128.2                                                                              | O K    |
| 180 min Winter                                              | 0.881               | 0.881                                  | 14.4                        | 1234.0                                                                              | O K    |
| 240 min Winter                                              | 0.920               | 0.920                                  | 14.4                        | 1296.7                                                                              | O K    |
| 360 min Winter                                              | 0.966               | 0.966                                  | 14.4                        | 1370.4                                                                              | O K    |
| 480 min Winter                                              | 0.989               | 0.989                                  | 14.4                        | 1407.8                                                                              | O K    |
| 600 min Winter                                              | 0.999               | 0.999                                  | 14.5                        | 1423.7                                                                              | O K    |
| 720 min Winter                                              | 1.000               | 1.000                                  | 14.5                        | 1426.2                                                                              | O K    |
| 960 min Winter                                              | 0.988               | 0.988                                  | 14.4                        | 1407.2                                                                              | O K    |
| 1440 min Winter                                             | 0.953               | 0.953                                  | 14.4                        | 1349.9                                                                              | O K    |
| 2160 min Winter                                             | 0.885               | 0.885                                  | 14.4                        | 1240.6                                                                              | O K    |
| 2880 min Winter                                             | 0.806               | 0.806                                  | 14.4                        | 1117.7                                                                              | O K    |
| 4320 min Winter                                             | 0.619               | 0.619                                  | 14.4                        | 834.8                                                                               | O K    |
| 5760 min Winter                                             | 0.448               | 0.448                                  | 14.4                        | 590.0                                                                               | O K    |
| 7200 min Winter                                             | 0.317               | 0.317                                  | 14.4                        | 409.1                                                                               | O K    |
| 8640 min Winter                                             | 0.230               | 0.230                                  | 14.2                        | 293.4                                                                               | O K    |
| 10080 min Winter                                            | 0.183               | 0.183                                  | 13.7                        | 231.0                                                                               | O K    |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                               | 49.937              | 0.0                                    | 948.8                       | 68                                                                                  |        |
| 120 min Winter                                              | 31.091              | 0.0                                    | 1182.3                      | 124                                                                                 |        |
| 180 min Winter                                              | 23.207              | 0.0                                    | 1323.6                      | 182                                                                                 |        |
| 240 min Winter                                              | 18.718              | 0.0                                    | 1422.9                      | 240                                                                                 |        |
| 360 min Winter                                              | 13.796              | 0.0                                    | 1571.4                      | 356                                                                                 |        |
| 480 min Winter                                              | 11.103              | 0.0                                    | 1683.8                      | 470                                                                                 |        |
| 600 min Winter                                              | 9.374               | 0.0                                    | 1773.6                      | 582                                                                                 |        |
| 720 min Winter                                              | 8.158               | 0.0                                    | 1848.1                      | 690                                                                                 |        |
| 960 min Winter                                              | 6.546               | 0.0                                    | 1964.7                      | 894                                                                                 |        |
| 1440 min Winter                                             | 4.790               | 0.0                                    | 2090.7                      | 1114                                                                                |        |
| 2160 min Winter                                             | 3.498               | 0.0                                    | 2422.0                      | 1580                                                                                |        |
| 2880 min Winter                                             | 2.794               | 0.0                                    | 2578.3                      | 2044                                                                                |        |
| 4320 min Winter                                             | 2.032               | 0.0                                    | 2808.4                      | 2860                                                                                |        |
| 5760 min Winter                                             | 1.619               | 0.0                                    | 3000.7                      | 3576                                                                                |        |
| 7200 min Winter                                             | 1.358               | 0.0                                    | 3143.5                      | 4192                                                                                |        |
| 8640 min Winter                                             | 1.177               | 0.0                                    | 3266.5                      | 4768                                                                                |        |
| 10080 min Winter                                            | 1.042               | 0.0                                    | 3370.3                      | 5256                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:00<br>File 2020-11-12 4937 DA3 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 2.302

| Time (mins) | Area  | Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 1.000 | 4 8         | 1.000 | 8 12        | 0.302 |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:00<br>File 2020-11-12 4937 DA3 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Model Details

Storage is Online Cover Level (m) 1.300

Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 1230.0                 | 1.300     | 1762.7                 |

Hydro-Brake® Optimum Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0172-1450-1000-1450 |
| Design Head (m)                   | 1.000                      |
| Design Flow (l/s)                 | 14.5                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 172                        |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 225                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 14.5       |
| Flush-Flo™                | 0.320    | 14.4       |
| Kick-Flo®                 | 0.699    | 12.2       |
| Mean Flow over Head Range | -        | 12.3       |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 6.1        | 1.200     | 15.8       | 3.000     | 24.5       | 7.000     | 36.8       |
| 0.200     | 13.9       | 1.400     | 17.0       | 3.500     | 26.3       | 7.500     | 38.0       |
| 0.300     | 14.4       | 1.600     | 18.1       | 4.000     | 28.1       | 8.000     | 39.2       |
| 0.400     | 14.3       | 1.800     | 19.2       | 4.500     | 29.7       | 8.500     | 40.4       |
| 0.500     | 14.0       | 2.000     | 20.1       | 5.000     | 31.3       | 9.000     | 41.5       |
| 0.600     | 13.5       | 2.200     | 21.1       | 5.500     | 32.7       | 9.500     | 42.6       |
| 0.800     | 13.0       | 2.400     | 22.0       | 6.000     | 34.1       |           |            |
| 1.000     | 14.5       | 2.600     | 22.8       | 6.500     | 35.5       |           |            |

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|                                                             |                     |                           |                             |                                                                                     |        |
|-------------------------------------------------------------|---------------------|---------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                    |                     |                           |                             | Page 1                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB             |                     |                           |                             |  |        |
| Date 12/11/2020 11:10                                       |                     | Designed by MichaelDarby  |                             |                                                                                     |        |
| File 2020-11-12 4937 DA4 100...                             |                     | Checked by                |                             |                                                                                     |        |
| XP Solutions                                                |                     | Source Control 2020.1     |                             |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+30%)</u> |                     |                           |                             |                                                                                     |        |
| Storm<br>Event                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 15 min Summer                                               | 0.387               | 0.387                     | 7.8                         | 260.2                                                                               | O K    |
| 30 min Summer                                               | 0.506               | 0.506                     | 7.8                         | 349.2                                                                               | O K    |
| 60 min Summer                                               | 0.628               | 0.628                     | 7.8                         | 444.3                                                                               | O K    |
| 120 min Summer                                              | 0.745               | 0.745                     | 7.8                         | 539.1                                                                               | O K    |
| 180 min Summer                                              | 0.802               | 0.802                     | 7.8                         | 587.4                                                                               | O K    |
| 240 min Summer                                              | 0.834               | 0.834                     | 7.8                         | 615.0                                                                               | O K    |
| 360 min Summer                                              | 0.869               | 0.869                     | 7.8                         | 645.3                                                                               | O K    |
| 480 min Summer                                              | 0.884               | 0.884                     | 7.8                         | 658.1                                                                               | O K    |
| 600 min Summer                                              | 0.887               | 0.887                     | 7.8                         | 660.7                                                                               | O K    |
| 720 min Summer                                              | 0.883               | 0.883                     | 7.8                         | 657.4                                                                               | O K    |
| 960 min Summer                                              | 0.872               | 0.872                     | 7.8                         | 647.7                                                                               | O K    |
| 1440 min Summer                                             | 0.843               | 0.843                     | 7.8                         | 622.1                                                                               | O K    |
| 2160 min Summer                                             | 0.792               | 0.792                     | 7.8                         | 578.8                                                                               | O K    |
| 2880 min Summer                                             | 0.738               | 0.738                     | 7.8                         | 533.8                                                                               | O K    |
| 4320 min Summer                                             | 0.616               | 0.616                     | 7.8                         | 434.1                                                                               | O K    |
| 5760 min Summer                                             | 0.499               | 0.499                     | 7.8                         | 343.6                                                                               | O K    |
| 7200 min Summer                                             | 0.402               | 0.402                     | 7.8                         | 270.9                                                                               | O K    |
| 8640 min Summer                                             | 0.323               | 0.323                     | 7.8                         | 214.3                                                                               | O K    |
| 10080 min Summer                                            | 0.262               | 0.262                     | 7.8                         | 171.8                                                                               | O K    |
| 15 min Winter                                               | 0.430               | 0.430                     | 7.8                         | 292.1                                                                               | O K    |
| 30 min Winter                                               | 0.563               | 0.563                     | 7.8                         | 392.4                                                                               | O K    |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 15 min Summer                                               | 114.680             | 0.0                       | 257.7                       | 21                                                                                  |        |
| 30 min Summer                                               | 77.440              | 0.0                       | 349.1                       | 36                                                                                  |        |
| 60 min Summer                                               | 49.937              | 0.0                       | 460.3                       | 64                                                                                  |        |
| 120 min Summer                                              | 31.091              | 0.0                       | 573.5                       | 124                                                                                 |        |
| 180 min Summer                                              | 23.207              | 0.0                       | 642.2                       | 184                                                                                 |        |
| 240 min Summer                                              | 18.718              | 0.0                       | 690.6                       | 242                                                                                 |        |
| 360 min Summer                                              | 13.796              | 0.0                       | 763.1                       | 362                                                                                 |        |
| 480 min Summer                                              | 11.103              | 0.0                       | 818.5                       | 482                                                                                 |        |
| 600 min Summer                                              | 9.374               | 0.0                       | 863.1                       | 600                                                                                 |        |
| 720 min Summer                                              | 8.158               | 0.0                       | 900.6                       | 684                                                                                 |        |
| 960 min Summer                                              | 6.546               | 0.0                       | 961.1                       | 792                                                                                 |        |
| 1440 min Summer                                             | 4.790               | 0.0                       | 1043.8                      | 1044                                                                                |        |
| 2160 min Summer                                             | 3.498               | 0.0                       | 1169.4                      | 1468                                                                                |        |
| 2880 min Summer                                             | 2.794               | 0.0                       | 1245.2                      | 1876                                                                                |        |
| 4320 min Summer                                             | 2.032               | 0.0                       | 1357.0                      | 2680                                                                                |        |
| 5760 min Summer                                             | 1.619               | 0.0                       | 1446.5                      | 3400                                                                                |        |
| 7200 min Summer                                             | 1.358               | 0.0                       | 1515.5                      | 4104                                                                                |        |
| 8640 min Summer                                             | 1.177               | 0.0                       | 1575.1                      | 4760                                                                                |        |
| 10080 min Summer                                            | 1.042               | 0.0                       | 1625.9                      | 5448                                                                                |        |
| 15 min Winter                                               | 114.680             | 0.0                       | 289.1                       | 21                                                                                  |        |
| 30 min Winter                                               | 77.440              | 0.0                       | 390.9                       | 36                                                                                  |        |
| ©1982-2020 Innovyze                                         |                     |                           |                             |                                                                                     |        |

|                                                             |                     |                                        |                             |                                                                                     |        |
|-------------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                    |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB             |                     |                                        |                             |  |        |
| Date 12/11/2020 11:10<br>File 2020-11-12 4937 DA4 100...    |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                                |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+30%)</u> |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                               | 0.698               | 0.698                                  | 7.8                         | 500.3                                                                               | O K    |
| 120 min Winter                                              | 0.826               | 0.826                                  | 7.8                         | 607.5                                                                               | O K    |
| 180 min Winter                                              | 0.890               | 0.890                                  | 7.8                         | 663.4                                                                               | O K    |
| 240 min Winter                                              | 0.927               | 0.927                                  | 7.8                         | 696.2                                                                               | O K    |
| 360 min Winter                                              | 0.970               | 0.970                                  | 7.8                         | 734.3                                                                               | O K    |
| 480 min Winter                                              | 0.990               | 0.990                                  | 7.8                         | 753.0                                                                               | O K    |
| 600 min Winter                                              | 0.998               | 0.998                                  | 7.8                         | 760.3                                                                               | O K    |
| 720 min Winter                                              | 0.998               | 0.998                                  | 7.8                         | 760.4                                                                               | O K    |
| 960 min Winter                                              | 0.985               | 0.985                                  | 7.8                         | 748.1                                                                               | O K    |
| 1440 min Winter                                             | 0.947               | 0.947                                  | 7.8                         | 713.8                                                                               | O K    |
| 2160 min Winter                                             | 0.878               | 0.878                                  | 7.8                         | 652.6                                                                               | O K    |
| 2880 min Winter                                             | 0.800               | 0.800                                  | 7.8                         | 585.9                                                                               | O K    |
| 4320 min Winter                                             | 0.616               | 0.616                                  | 7.8                         | 434.2                                                                               | O K    |
| 5760 min Winter                                             | 0.436               | 0.436                                  | 7.8                         | 296.5                                                                               | O K    |
| 7200 min Winter                                             | 0.300               | 0.300                                  | 7.8                         | 198.2                                                                               | O K    |
| 8640 min Winter                                             | 0.211               | 0.211                                  | 7.6                         | 136.5                                                                               | O K    |
| 10080 min Winter                                            | 0.158               | 0.158                                  | 7.3                         | 101.4                                                                               | O K    |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                               | 49.937              | 0.0                                    | 515.8                       | 64                                                                                  |        |
| 120 min Winter                                              | 31.091              | 0.0                                    | 642.5                       | 122                                                                                 |        |
| 180 min Winter                                              | 23.207              | 0.0                                    | 719.2                       | 180                                                                                 |        |
| 240 min Winter                                              | 18.718              | 0.0                                    | 773.3                       | 238                                                                                 |        |
| 360 min Winter                                              | 13.796              | 0.0                                    | 854.2                       | 354                                                                                 |        |
| 480 min Winter                                              | 11.103              | 0.0                                    | 915.8                       | 468                                                                                 |        |
| 600 min Winter                                              | 9.374               | 0.0                                    | 965.2                       | 580                                                                                 |        |
| 720 min Winter                                              | 8.158               | 0.0                                    | 1006.4                      | 688                                                                                 |        |
| 960 min Winter                                              | 6.546               | 0.0                                    | 1071.7                      | 894                                                                                 |        |
| 1440 min Winter                                             | 4.790               | 0.0                                    | 1142.9                      | 1112                                                                                |        |
| 2160 min Winter                                             | 3.498               | 0.0                                    | 1309.8                      | 1580                                                                                |        |
| 2880 min Winter                                             | 2.794               | 0.0                                    | 1394.7                      | 2044                                                                                |        |
| 4320 min Winter                                             | 2.032               | 0.0                                    | 1520.2                      | 2896                                                                                |        |
| 5760 min Winter                                             | 1.619               | 0.0                                    | 1620.3                      | 3576                                                                                |        |
| 7200 min Winter                                             | 1.358               | 0.0                                    | 1697.7                      | 4184                                                                                |        |
| 8640 min Winter                                             | 1.177               | 0.0                                    | 1764.6                      | 4832                                                                                |        |
| 10080 min Winter                                            | 1.042               | 0.0                                    | 1822.0                      | 5352                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:10<br>File 2020-11-12 4937 DA4 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 1.242

| Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 1.000 | 4 8         | 0.242 |

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| Weetwood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        | Page 4                                                                              |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
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| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                        |  |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Date 12/11/2020 11:10<br>File 2020-11-12 4937 DA4 100...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Designed by MichaelDarby<br>Checked by |                                                                                     |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |                                                                                     |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Source Control 2020.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                        |                                                                                     |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 1.300</div> <div>Tank or Pond Structure</div> <div>Invert Level (m) 0.000</div> <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>620.0</td><td>1.300</td><td>1012.0</td></tr></tbody></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0130-7800-1000-7800</div> <div>Design Head (m) 1.000</div> <div>Design Flow (l/s) 7.8</div> <div>Flush-Flo™ Calculated</div> <div>Objective Minimise upstream storage</div> <div>Application Surface</div> <div>Sump Available Yes</div> <div>Diameter (mm) 130</div> <div>Invert Level (m) 0.000</div> <div>Minimum Outlet Pipe Diameter (mm) 150</div> <div>Suggested Manhole Diameter (mm) 1200</div> <div>Control Points</div> <table><thead><tr><th></th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.000</td><td>7.8</td></tr><tr><td>Flush-Flo™</td><td>0.302</td><td>7.8</td></tr><tr><td>Kick-Flo®</td><td>0.664</td><td>6.4</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>6.7</td></tr></tbody></table> <div>The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated</div> <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>4.7</td><td>1.200</td><td>8.5</td><td>3.000</td><td>13.1</td><td>7.000</td><td>19.6</td></tr><tr><td>0.200</td><td>7.6</td><td>1.400</td><td>9.1</td><td>3.500</td><td>14.1</td><td>7.500</td><td>20.3</td></tr><tr><td>0.300</td><td>7.8</td><td>1.600</td><td>9.7</td><td>4.000</td><td>15.0</td><td>8.000</td><td>20.9</td></tr><tr><td>0.400</td><td>7.7</td><td>1.800</td><td>10.3</td><td>4.500</td><td>15.9</td><td>8.500</td><td>21.6</td></tr><tr><td>0.500</td><td>7.5</td><td>2.000</td><td>10.8</td><td>5.000</td><td>16.7</td><td>9.000</td><td>22.2</td></tr><tr><td>0.600</td><td>7.1</td><td>2.200</td><td>11.3</td><td>5.500</td><td>17.5</td><td>9.500</td><td>22.7</td></tr><tr><td>0.800</td><td>7.0</td><td>2.400</td><td>11.8</td><td>6.000</td><td>18.2</td><td></td><td></td></tr><tr><td>1.000</td><td>7.8</td><td>2.600</td><td>12.2</td><td>6.500</td><td>18.9</td><td></td><td></td></tr></tbody></table> |                                        |                                                                                     | Depth (m)  | Area (m²) | Depth (m)  | Area (m²) | 0.000      | 620.0 | 1.300 | 1012.0 |  | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.000 | 7.8 | Flush-Flo™ | 0.302 | 7.8 | Kick-Flo® | 0.664 | 6.4 | Mean Flow over Head Range | - | 6.7 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 4.7 | 1.200 | 8.5 | 3.000 | 13.1 | 7.000 | 19.6 | 0.200 | 7.6 | 1.400 | 9.1 | 3.500 | 14.1 | 7.500 | 20.3 | 0.300 | 7.8 | 1.600 | 9.7 | 4.000 | 15.0 | 8.000 | 20.9 | 0.400 | 7.7 | 1.800 | 10.3 | 4.500 | 15.9 | 8.500 | 21.6 | 0.500 | 7.5 | 2.000 | 10.8 | 5.000 | 16.7 | 9.000 | 22.2 | 0.600 | 7.1 | 2.200 | 11.3 | 5.500 | 17.5 | 9.500 | 22.7 | 0.800 | 7.0 | 2.400 | 11.8 | 6.000 | 18.2 |  |  | 1.000 | 7.8 | 2.600 | 12.2 | 6.500 | 18.9 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Area (m²)                              | Depth (m)                                                                           | Area (m²)  |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 620.0                                  | 1.300                                                                               | 1012.0     |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Head (m)                               | Flow (l/s)                                                                          |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000                                  | 7.8                                                                                 |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.302                                  | 7.8                                                                                 |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.664                                  | 6.4                                                                                 |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -                                      | 6.7                                                                                 |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Flow (l/s)                             | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.7                                    | 1.200                                                                               | 8.5        | 3.000     | 13.1       | 7.000     | 19.6       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.6                                    | 1.400                                                                               | 9.1        | 3.500     | 14.1       | 7.500     | 20.3       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.8                                    | 1.600                                                                               | 9.7        | 4.000     | 15.0       | 8.000     | 20.9       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.7                                    | 1.800                                                                               | 10.3       | 4.500     | 15.9       | 8.500     | 21.6       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.5                                    | 2.000                                                                               | 10.8       | 5.000     | 16.7       | 9.000     | 22.2       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.1                                    | 2.200                                                                               | 11.3       | 5.500     | 17.5       | 9.500     | 22.7       |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.0                                    | 2.400                                                                               | 11.8       | 6.000     | 18.2       |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7.8                                    | 2.600                                                                               | 12.2       | 6.500     | 18.9       |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |                                                                                     |            |           |            |           |            |       |       |        |  |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |       |      |       |     |       |      |       |      |  |  |       |     |       |      |       |      |  |  |

| Weetwood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                           |                                                                                     |                       | Page 1 |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
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| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                           |  |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| Date 12/11/2020 11:19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                           |                                                                                     |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| File 2020-11-12 4937 DA5 100...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                           |                                                                                     |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |                           | Designed by MichaelDarby<br>Checked by                                              |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                           | Source Control 2020.1                                                               |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| <u>Summary of Results for 100 year Return Period (+30%)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                           |                                                                                     |                       |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| <table><tr><th>Storm<br/>Event</th><th>Max<br/>Level<br/>(m)</th><th>Max<br/>Depth<br/>(m)</th><th>Max<br/>Control<br/>(l/s)</th><th>Max<br/>Volume<br/>(m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.404</td><td>0.404</td><td>5.1</td><td>168.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.524</td><td>0.524</td><td>5.1</td><td>226.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.645</td><td>0.645</td><td>5.1</td><td>287.4</td><td>O K</td></tr><tr><td>120 min Summer</td><td>0.758</td><td>0.758</td><td>5.1</td><td>347.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>0.813</td><td>0.813</td><td>5.1</td><td>378.1</td><td>O K</td></tr><tr><td>240 min Summer</td><td>0.844</td><td>0.844</td><td>5.1</td><td>395.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>0.876</td><td>0.876</td><td>5.1</td><td>413.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.888</td><td>0.888</td><td>5.1</td><td>420.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.889</td><td>0.889</td><td>5.1</td><td>421.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.885</td><td>0.885</td><td>5.1</td><td>418.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.872</td><td>0.872</td><td>5.1</td><td>411.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.841</td><td>0.841</td><td>5.1</td><td>393.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.790</td><td>0.790</td><td>5.1</td><td>365.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.737</td><td>0.737</td><td>5.1</td><td>336.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.618</td><td>0.618</td><td>5.1</td><td>273.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.495</td><td>0.495</td><td>5.1</td><td>212.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.395</td><td>0.395</td><td>5.1</td><td>164.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.314</td><td>0.314</td><td>5.1</td><td>128.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.252</td><td>0.252</td><td>5.1</td><td>101.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.448</td><td>0.448</td><td>5.1</td><td>189.5</td><td>O K</td></tr><tr><td>30 min Winter</td><td>0.580</td><td>0.580</td><td>5.1</td><td>254.2</td><td>O K</td></tr></table> |                     |                           |                                                                                     |                       |        |  | Storm<br>Event | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³) | Status        | 15 min Summer | 0.404 | 0.404 | 5.1 | 168.9         | O K    | 30 min Summer | 0.524 | 0.524 | 5.1           | 226.2  | O K | 60 min Summer | 0.645 | 0.645          | 5.1    | 287.4 | O K   | 120 min Summer | 0.758          | 0.758  | 5.1 | 347.5 | O K | 180 min Summer | 0.813  | 0.813 | 5.1   | 378.1 | O K            | 240 min Summer | 0.844 | 0.844 | 5.1 | 395.3          | O K    | 360 min Summer | 0.876 | 0.876 | 5.1            | 413.6 | O K | 480 min Summer | 0.888 | 0.888          | 5.1   | 420.9 | O K   | 600 min Summer | 0.889          | 0.889 | 5.1 | 421.6 | O K | 720 min Summer  | 0.885 | 0.885 | 5.1   | 418.8 | O K             | 960 min Summer | 0.872 | 0.872 | 5.1  | 411.5           | O K   | 1440 min Summer | 0.841 | 0.841 | 5.1             | 393.7 | O K | 2160 min Summer | 0.790 | 0.790           | 5.1   | 365.2 | O K   | 2880 min Summer | 0.737           | 0.737 | 5.1 | 336.2 | O K  | 4320 min Summer | 0.618 | 0.618 | 5.1    | 273.4 | O K              | 5760 min Summer | 0.495 | 0.495  | 5.1  | 212.1         | O K     | 7200 min Summer | 0.395 | 0.395 | 5.1           | 164.6  | O K | 8640 min Summer | 0.314 | 0.314 | 5.1 | 128.2 | O K | 10080 min Summer | 0.252 | 0.252 | 5.1 | 101.2 | O K | 15 min Winter | 0.448 | 0.448 | 5.1 | 189.5 | O K | 30 min Winter | 0.580 | 0.580 | 5.1 | 254.2 | O K |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)                                                             | Max<br>Volume<br>(m³) | Status |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.404               | 0.404                     | 5.1                                                                                 | 168.9                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.524               | 0.524                     | 5.1                                                                                 | 226.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.645               | 0.645                     | 5.1                                                                                 | 287.4                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.758               | 0.758                     | 5.1                                                                                 | 347.5                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.813               | 0.813                     | 5.1                                                                                 | 378.1                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.844               | 0.844                     | 5.1                                                                                 | 395.3                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.876               | 0.876                     | 5.1                                                                                 | 413.6                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.888               | 0.888                     | 5.1                                                                                 | 420.9                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.889               | 0.889                     | 5.1                                                                                 | 421.6                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.885               | 0.885                     | 5.1                                                                                 | 418.8                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.872               | 0.872                     | 5.1                                                                                 | 411.5                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.841               | 0.841                     | 5.1                                                                                 | 393.7                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.790               | 0.790                     | 5.1                                                                                 | 365.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.737               | 0.737                     | 5.1                                                                                 | 336.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.618               | 0.618                     | 5.1                                                                                 | 273.4                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.495               | 0.495                     | 5.1                                                                                 | 212.1                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.395               | 0.395                     | 5.1                                                                                 | 164.6                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.314               | 0.314                     | 5.1                                                                                 | 128.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.252               | 0.252                     | 5.1                                                                                 | 101.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.448               | 0.448                     | 5.1                                                                                 | 189.5                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 30 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.580               | 0.580                     | 5.1                                                                                 | 254.2                 | O K    |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| <table><tr><th>Storm<br/>Event</th><th>Rain<br/>(mm/hr)</th><th>Flooded<br/>Volume<br/>(m³)</th><th>Discharge<br/>Volume<br/>(m³)</th><th>Time-Peak<br/>(mins)</th></tr><tr><td>15 min Summer</td><td>114.680</td><td>0.0</td><td>168.7</td><td>19</td></tr><tr><td>30 min Summer</td><td>77.440</td><td>0.0</td><td>228.2</td><td>34</td></tr><tr><td>60 min Summer</td><td>49.937</td><td>0.0</td><td>298.7</td><td>64</td></tr><tr><td>120 min Summer</td><td>31.091</td><td>0.0</td><td>372.1</td><td>122</td></tr><tr><td>180 min Summer</td><td>23.207</td><td>0.0</td><td>416.7</td><td>182</td></tr><tr><td>240 min Summer</td><td>18.718</td><td>0.0</td><td>448.1</td><td>242</td></tr><tr><td>360 min Summer</td><td>13.796</td><td>0.0</td><td>495.2</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.103</td><td>0.0</td><td>531.2</td><td>480</td></tr><tr><td>600 min Summer</td><td>9.374</td><td>0.0</td><td>560.3</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.158</td><td>0.0</td><td>584.8</td><td>672</td></tr><tr><td>960 min Summer</td><td>6.546</td><td>0.0</td><td>624.7</td><td>788</td></tr><tr><td>1440 min Summer</td><td>4.790</td><td>0.0</td><td>680.6</td><td>1040</td></tr><tr><td>2160 min Summer</td><td>3.498</td><td>0.0</td><td>756.9</td><td>1452</td></tr><tr><td>2880 min Summer</td><td>2.794</td><td>0.0</td><td>806.1</td><td>1876</td></tr><tr><td>4320 min Summer</td><td>2.032</td><td>0.0</td><td>878.8</td><td>2680</td></tr><tr><td>5760 min Summer</td><td>1.619</td><td>0.0</td><td>935.6</td><td>3400</td></tr><tr><td>7200 min Summer</td><td>1.358</td><td>0.0</td><td>980.3</td><td>4104</td></tr><tr><td>8640 min Summer</td><td>1.177</td><td>0.0</td><td>1019.1</td><td>4760</td></tr><tr><td>10080 min Summer</td><td>1.042</td><td>0.0</td><td>1052.4</td><td>5448</td></tr><tr><td>15 min Winter</td><td>114.680</td><td>0.0</td><td>189.1</td><td>19</td></tr><tr><td>30 min Winter</td><td>77.440</td><td>0.0</td><td>255.5</td><td>33</td></tr></table>                                                                                                                                                                                                                                                                                                   |                     |                           |                                                                                     |                       |        |  | Storm<br>Event | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)   | 15 min Summer | 114.680       | 0.0   | 168.7 | 19  | 30 min Summer | 77.440 | 0.0           | 228.2 | 34    | 60 min Summer | 49.937 | 0.0 | 298.7         | 64    | 120 min Summer | 31.091 | 0.0   | 372.1 | 122            | 180 min Summer | 23.207 | 0.0 | 416.7 | 182 | 240 min Summer | 18.718 | 0.0   | 448.1 | 242   | 360 min Summer | 13.796         | 0.0   | 495.2 | 362 | 480 min Summer | 11.103 | 0.0            | 531.2 | 480   | 600 min Summer | 9.374 | 0.0 | 560.3          | 600   | 720 min Summer | 8.158 | 0.0   | 584.8 | 672            | 960 min Summer | 6.546 | 0.0 | 624.7 | 788 | 1440 min Summer | 4.790 | 0.0   | 680.6 | 1040  | 2160 min Summer | 3.498          | 0.0   | 756.9 | 1452 | 2880 min Summer | 2.794 | 0.0             | 806.1 | 1876  | 4320 min Summer | 2.032 | 0.0 | 878.8           | 2680  | 5760 min Summer | 1.619 | 0.0   | 935.6 | 3400            | 7200 min Summer | 1.358 | 0.0 | 980.3 | 4104 | 8640 min Summer | 1.177 | 0.0   | 1019.1 | 4760  | 10080 min Summer | 1.042           | 0.0   | 1052.4 | 5448 | 15 min Winter | 114.680 | 0.0             | 189.1 | 19    | 30 min Winter | 77.440 | 0.0 | 255.5           | 33    |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³)                                                         | Time-Peak<br>(mins)   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 114.680             | 0.0                       | 168.7                                                                               | 19                    |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 77.440              | 0.0                       | 228.2                                                                               | 34                    |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 49.937              | 0.0                       | 298.7                                                                               | 64                    |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 31.091              | 0.0                       | 372.1                                                                               | 122                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 23.207              | 0.0                       | 416.7                                                                               | 182                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18.718              | 0.0                       | 448.1                                                                               | 242                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 13.796              | 0.0                       | 495.2                                                                               | 362                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11.103              | 0.0                       | 531.2                                                                               | 480                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 9.374               | 0.0                       | 560.3                                                                               | 600                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8.158               | 0.0                       | 584.8                                                                               | 672                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 6.546               | 0.0                       | 624.7                                                                               | 788                   |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.790               | 0.0                       | 680.6                                                                               | 1040                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.498               | 0.0                       | 756.9                                                                               | 1452                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.794               | 0.0                       | 806.1                                                                               | 1876                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.032               | 0.0                       | 878.8                                                                               | 2680                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.619               | 0.0                       | 935.6                                                                               | 3400                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.358               | 0.0                       | 980.3                                                                               | 4104                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.177               | 0.0                       | 1019.1                                                                              | 4760                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.042               | 0.0                       | 1052.4                                                                              | 5448                  |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 114.680             | 0.0                       | 189.1                                                                               | 19                    |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
| 30 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 77.440              | 0.0                       | 255.5                                                                               | 33                    |        |  |                |                     |                           |                             |                       |               |               |       |       |     |               |        |               |       |       |               |        |     |               |       |                |        |       |       |                |                |        |     |       |     |                |        |       |       |       |                |                |       |       |     |                |        |                |       |       |                |       |     |                |       |                |       |       |       |                |                |       |     |       |     |                 |       |       |       |       |                 |                |       |       |      |                 |       |                 |       |       |                 |       |     |                 |       |                 |       |       |       |                 |                 |       |     |       |      |                 |       |       |        |       |                  |                 |       |        |      |               |         |                 |       |       |               |        |     |                 |       |       |     |       |     |                  |       |       |     |       |     |               |       |       |     |       |     |               |       |       |     |       |     |
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|                                                          |                     |                                        |                             |                                                                                     |        |
|----------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                 |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                     |                                        |                             |  |        |
| Date 12/11/2020 11:19<br>File 2020-11-12 4937 DA5 100... |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                             |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| Summary of Results for 100 year Return Period (+30%)     |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                           | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                            | 0.713               | 0.713                                  | 5.1                         | 323.3                                                                               | O K    |
| 120 min Winter                                           | 0.837               | 0.837                                  | 5.1                         | 391.8                                                                               | O K    |
| 180 min Winter                                           | 0.899               | 0.899                                  | 5.1                         | 427.4                                                                               | O K    |
| 240 min Winter                                           | 0.934               | 0.934                                  | 5.1                         | 448.0                                                                               | O K    |
| 360 min Winter                                           | 0.974               | 0.974                                  | 5.1                         | 471.6                                                                               | O K    |
| 480 min Winter                                           | 0.992               | 0.992                                  | 5.1                         | 482.8                                                                               | O K    |
| 600 min Winter                                           | 0.999               | 0.999                                  | 5.1                         | 486.7                                                                               | O K    |
| 720 min Winter                                           | 0.998               | 0.998                                  | 5.1                         | 486.0                                                                               | O K    |
| 960 min Winter                                           | 0.982               | 0.982                                  | 5.1                         | 476.8                                                                               | O K    |
| 1440 min Winter                                          | 0.943               | 0.943                                  | 5.1                         | 453.3                                                                               | O K    |
| 2160 min Winter                                          | 0.874               | 0.874                                  | 5.1                         | 412.6                                                                               | O K    |
| 2880 min Winter                                          | 0.797               | 0.797                                  | 5.1                         | 369.2                                                                               | O K    |
| 4320 min Winter                                          | 0.617               | 0.617                                  | 5.1                         | 273.0                                                                               | O K    |
| 5760 min Winter                                          | 0.428               | 0.428                                  | 5.1                         | 180.2                                                                               | O K    |
| 7200 min Winter                                          | 0.289               | 0.289                                  | 5.1                         | 117.4                                                                               | O K    |
| 8640 min Winter                                          | 0.199               | 0.199                                  | 5.0                         | 78.8                                                                                | O K    |
| 10080 min Winter                                         | 0.146               | 0.146                                  | 4.7                         | 56.9                                                                                | O K    |
| Storm<br>Event                                           | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                            | 49.937              | 0.0                                    | 334.7                       | 62                                                                                  |        |
| 120 min Winter                                           | 31.091              | 0.0                                    | 416.8                       | 122                                                                                 |        |
| 180 min Winter                                           | 23.207              | 0.0                                    | 466.6                       | 180                                                                                 |        |
| 240 min Winter                                           | 18.718              | 0.0                                    | 501.7                       | 238                                                                                 |        |
| 360 min Winter                                           | 13.796              | 0.0                                    | 554.4                       | 354                                                                                 |        |
| 480 min Winter                                           | 11.103              | 0.0                                    | 594.5                       | 468                                                                                 |        |
| 600 min Winter                                           | 9.374               | 0.0                                    | 626.9                       | 578                                                                                 |        |
| 720 min Winter                                           | 8.158               | 0.0                                    | 654.0                       | 686                                                                                 |        |
| 960 min Winter                                           | 6.546               | 0.0                                    | 697.4                       | 892                                                                                 |        |
| 1440 min Winter                                          | 4.790               | 0.0                                    | 748.4                       | 1110                                                                                |        |
| 2160 min Winter                                          | 3.498               | 0.0                                    | 847.8                       | 1576                                                                                |        |
| 2880 min Winter                                          | 2.794               | 0.0                                    | 902.8                       | 2044                                                                                |        |
| 4320 min Winter                                          | 2.032               | 0.0                                    | 984.4                       | 2900                                                                                |        |
| 5760 min Winter                                          | 1.619               | 0.0                                    | 1048.0                      | 3576                                                                                |        |
| 7200 min Winter                                          | 1.358               | 0.0                                    | 1098.1                      | 4184                                                                                |        |
| 8640 min Winter                                          | 1.177               | 0.0                                    | 1141.6                      | 4760                                                                                |        |
| 10080 min Winter                                         | 1.042               | 0.0                                    | 1179.1                      | 5352                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:19<br>File 2020-11-12 4937 DA5 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 0.803

| Time (mins) |     | Area  |
|-------------|-----|-------|
| From:       | To: | (ha)  |
| 0           | 4   | 0.803 |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:19<br>File 2020-11-12 4937 DA5 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Model Details

Storage is Online Cover Level (m) 1.300

Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 375.0                  | 1.300     | 690.5                  |

Hydro-Brake® Optimum Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0107-5100-1000-5100 |
| Design Head (m)                   | 1.000                      |
| Design Flow (l/s)                 | 5.1                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 107                        |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 150                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 5.1        |
| Flush-Flo™                | 0.297    | 5.1        |
| Kick-Flo®                 | 0.640    | 4.2        |
| Mean Flow over Head Range | -        | 4.4        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 3.6        | 1.200     | 5.6        | 3.000     | 8.5        | 7.000     | 12.8       |
| 0.200     | 5.0        | 1.400     | 6.0        | 3.500     | 9.2        | 7.500     | 13.2       |
| 0.300     | 5.1        | 1.600     | 6.3        | 4.000     | 9.8        | 8.000     | 13.6       |
| 0.400     | 5.0        | 1.800     | 6.7        | 4.500     | 10.3       | 8.500     | 14.0       |
| 0.500     | 4.9        | 2.000     | 7.0        | 5.000     | 10.9       | 9.000     | 14.4       |
| 0.600     | 4.5        | 2.200     | 7.4        | 5.500     | 11.4       | 9.500     | 14.8       |
| 0.800     | 4.6        | 2.400     | 7.7        | 6.000     | 11.9       |           |            |
| 1.000     | 5.1        | 2.600     | 8.0        | 6.500     | 12.3       |           |            |

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| Weetwood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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             |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| Date 12/11/2020 12:05<br>File 2020-11-12 4937 DA6 100...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| <p>Summary of Results for 100 year Return Period (+30%)</p> <p>Half Drain Time : 829 minutes.</p> <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (1/s)</th><th>Max Control (1/s)</th><th>Max Outflow (1/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.415</td><td>0.415</td><td>0.0</td><td>4.7</td><td>4.7</td><td>155.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.555</td><td>0.555</td><td>0.0</td><td>4.7</td><td>4.7</td><td>208.4</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.706</td><td>0.706</td><td>0.0</td><td>4.7</td><td>4.7</td><td>264.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>0.855</td><td>0.855</td><td>0.0</td><td>4.7</td><td>4.7</td><td>320.9</td><td>O K</td></tr><tr><td>180 min Summer</td><td>0.931</td><td>0.931</td><td>0.0</td><td>4.7</td><td>4.7</td><td>349.4</td><td>O K</td></tr><tr><td>240 min Summer</td><td>0.974</td><td>0.974</td><td>0.0</td><td>4.7</td><td>4.7</td><td>365.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.021</td><td>1.021</td><td>0.0</td><td>4.7</td><td>4.7</td><td>383.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.040</td><td>1.040</td><td>0.0</td><td>4.7</td><td>4.7</td><td>390.2</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.043</td><td>1.043</td><td>0.0</td><td>4.7</td><td>4.7</td><td>391.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.037</td><td>1.037</td><td>0.0</td><td>4.7</td><td>4.7</td><td>389.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.020</td><td>1.020</td><td>0.0</td><td>4.7</td><td>4.7</td><td>382.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.978</td><td>0.978</td><td>0.0</td><td>4.7</td><td>4.7</td><td>366.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.909</td><td>0.909</td><td>0.0</td><td>4.7</td><td>4.7</td><td>340.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.837</td><td>0.837</td><td>0.0</td><td>4.7</td><td>4.7</td><td>314.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.674</td><td>0.674</td><td>0.0</td><td>4.7</td><td>4.7</td><td>252.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.530</td><td>0.530</td><td>0.0</td><td>4.7</td><td>4.7</td><td>198.8</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.417</td><td>0.417</td><td>0.0</td><td>4.7</td><td>4.7</td><td>156.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.332</td><td>0.332</td><td>0.0</td><td>4.7</td><td>4.7</td><td>124.6</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.268</td><td>0.268</td><td>0.0</td><td>4.6</td><td>4.6</td><td>100.5</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.466</td><td>0.466</td><td>0.0</td><td>4.7</td><td>4.7</td><td>174.7</td><td>O K</td></tr></table><br><table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>114.680</td><td>0.0</td><td>155.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>77.440</td><td>0.0</td><td>209.8</td><td>34</td></tr><tr><td>60 min Summer</td><td>49.937</td><td>0.0</td><td>275.1</td><td>64</td></tr><tr><td>120 min Summer</td><td>31.091</td><td>0.0</td><td>342.7</td><td>122</td></tr><tr><td>180 min Summer</td><td>23.207</td><td>0.0</td><td>383.7</td><td>182</td></tr><tr><td>240 min Summer</td><td>18.718</td><td>0.0</td><td>412.6</td><td>242</td></tr><tr><td>360 min Summer</td><td>13.796</td><td>0.0</td><td>456.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.103</td><td>0.0</td><td>489.1</td><td>480</td></tr><tr><td>600 min Summer</td><td>9.374</td><td>0.0</td><td>515.9</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.158</td><td>0.0</td><td>538.4</td><td>684</td></tr><tr><td>960 min Summer</td><td>6.546</td><td>0.0</td><td>574.9</td><td>790</td></tr><tr><td>1440 min Summer</td><td>4.790</td><td>0.0</td><td>625.5</td><td>1050</td></tr><tr><td>2160 min Summer</td><td>3.498</td><td>0.0</td><td>697.3</td><td>1468</td></tr><tr><td>2880 min Summer</td><td>2.794</td><td>0.0</td><td>742.6</td><td>1876</td></tr><tr><td>4320 min Summer</td><td>2.032</td><td>0.0</td><td>809.6</td><td>2680</td></tr><tr><td>5760 min Summer</td><td>1.619</td><td>0.0</td><td>862.1</td><td>3400</td></tr><tr><td>7200 min Summer</td><td>1.358</td><td>0.0</td><td>903.3</td><td>4104</td></tr><tr><td>8640 min Summer</td><td>1.177</td><td>0.0</td><td>939.0</td><td>4760</td></tr><tr><td>10080 min Summer</td><td>1.042</td><td>0.0</td><td>969.6</td><td>5448</td></tr><tr><td>15 min Winter</td><td>114.680</td><td>0.0</td><td>173.8</td><td>19</td></tr></table> |               |                                                                                     |                        | Storm Event                            | Max Level (m)     | Max Depth (m)   | Max Infiltration (1/s) | Max Control (1/s) | Max Outflow (1/s) | Max Volume (m³) | Status | 15 min Summer | 0.415 | 0.415 | 0.0 | 4.7 | 4.7 | 155.7 | O K | 30 min Summer | 0.555 | 0.555 | 0.0 | 4.7 | 4.7 | 208.4 | O K | 60 min Summer | 0.706 | 0.706 | 0.0 | 4.7 | 4.7 | 264.8 | O K | 120 min Summer | 0.855 | 0.855 | 0.0 | 4.7 | 4.7 | 320.9 | O K | 180 min Summer | 0.931 | 0.931 | 0.0 | 4.7 | 4.7 | 349.4 | O K | 240 min Summer | 0.974 | 0.974 | 0.0 | 4.7 | 4.7 | 365.5 | O K | 360 min Summer | 1.021 | 1.021 | 0.0 | 4.7 | 4.7 | 383.0 | O K | 480 min Summer | 1.040 | 1.040 | 0.0 | 4.7 | 4.7 | 390.2 | O K | 600 min Summer | 1.043 | 1.043 | 0.0 | 4.7 | 4.7 | 391.3 | O K | 720 min Summer | 1.037 | 1.037 | 0.0 | 4.7 | 4.7 | 389.0 | O K | 960 min Summer | 1.020 | 1.020 | 0.0 | 4.7 | 4.7 | 382.8 | O K | 1440 min Summer | 0.978 | 0.978 | 0.0 | 4.7 | 4.7 | 366.9 | O K | 2160 min Summer | 0.909 | 0.909 | 0.0 | 4.7 | 4.7 | 340.9 | O K | 2880 min Summer | 0.837 | 0.837 | 0.0 | 4.7 | 4.7 | 314.1 | O K | 4320 min Summer | 0.674 | 0.674 | 0.0 | 4.7 | 4.7 | 252.8 | O K | 5760 min Summer | 0.530 | 0.530 | 0.0 | 4.7 | 4.7 | 198.8 | O K | 7200 min Summer | 0.417 | 0.417 | 0.0 | 4.7 | 4.7 | 156.6 | O K | 8640 min Summer | 0.332 | 0.332 | 0.0 | 4.7 | 4.7 | 124.6 | O K | 10080 min Summer | 0.268 | 0.268 | 0.0 | 4.6 | 4.6 | 100.5 | O K | 15 min Winter | 0.466 | 0.466 | 0.0 | 4.7 | 4.7 | 174.7 | O K | Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) | 15 min Summer | 114.680 | 0.0 | 155.0 | 19 | 30 min Summer | 77.440 | 0.0 | 209.8 | 34 | 60 min Summer | 49.937 | 0.0 | 275.1 | 64 | 120 min Summer | 31.091 | 0.0 | 342.7 | 122 | 180 min Summer | 23.207 | 0.0 | 383.7 | 182 | 240 min Summer | 18.718 | 0.0 | 412.6 | 242 | 360 min Summer | 13.796 | 0.0 | 456.0 | 362 | 480 min Summer | 11.103 | 0.0 | 489.1 | 480 | 600 min Summer | 9.374 | 0.0 | 515.9 | 600 | 720 min Summer | 8.158 | 0.0 | 538.4 | 684 | 960 min Summer | 6.546 | 0.0 | 574.9 | 790 | 1440 min Summer | 4.790 | 0.0 | 625.5 | 1050 | 2160 min Summer | 3.498 | 0.0 | 697.3 | 1468 | 2880 min Summer | 2.794 | 0.0 | 742.6 | 1876 | 4320 min Summer | 2.032 | 0.0 | 809.6 | 2680 | 5760 min Summer | 1.619 | 0.0 | 862.1 | 3400 | 7200 min Summer | 1.358 | 0.0 | 903.3 | 4104 | 8640 min Summer | 1.177 | 0.0 | 939.0 | 4760 | 10080 min Summer | 1.042 | 0.0 | 969.6 | 5448 | 15 min Winter | 114.680 | 0.0 | 173.8 | 19 |
| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Max Level (m) | Max Depth (m)                                                                       | Max Infiltration (1/s) | Max Control (1/s)                      | Max Outflow (1/s) | Max Volume (m³) | Status                 |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.415         | 0.415                                                                               | 0.0                    | 4.7                                    | 4.7               | 155.7           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.555         | 0.555                                                                               | 0.0                    | 4.7                                    | 4.7               | 208.4           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.706         | 0.706                                                                               | 0.0                    | 4.7                                    | 4.7               | 264.8           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.855         | 0.855                                                                               | 0.0                    | 4.7                                    | 4.7               | 320.9           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.931         | 0.931                                                                               | 0.0                    | 4.7                                    | 4.7               | 349.4           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.974         | 0.974                                                                               | 0.0                    | 4.7                                    | 4.7               | 365.5           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.021         | 1.021                                                                               | 0.0                    | 4.7                                    | 4.7               | 383.0           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.040         | 1.040                                                                               | 0.0                    | 4.7                                    | 4.7               | 390.2           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.043         | 1.043                                                                               | 0.0                    | 4.7                                    | 4.7               | 391.3           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.037         | 1.037                                                                               | 0.0                    | 4.7                                    | 4.7               | 389.0           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.020         | 1.020                                                                               | 0.0                    | 4.7                                    | 4.7               | 382.8           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.978         | 0.978                                                                               | 0.0                    | 4.7                                    | 4.7               | 366.9           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.909         | 0.909                                                                               | 0.0                    | 4.7                                    | 4.7               | 340.9           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.837         | 0.837                                                                               | 0.0                    | 4.7                                    | 4.7               | 314.1           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.674         | 0.674                                                                               | 0.0                    | 4.7                                    | 4.7               | 252.8           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.530         | 0.530                                                                               | 0.0                    | 4.7                                    | 4.7               | 198.8           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.417         | 0.417                                                                               | 0.0                    | 4.7                                    | 4.7               | 156.6           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.332         | 0.332                                                                               | 0.0                    | 4.7                                    | 4.7               | 124.6           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.268         | 0.268                                                                               | 0.0                    | 4.6                                    | 4.6               | 100.5           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.466         | 0.466                                                                               | 0.0                    | 4.7                                    | 4.7               | 174.7           | O K                    |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |               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| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Rain (mm/hr)  | Flooded Volume (m³)                                                                 | Discharge Volume (m³)  | Time-Peak (mins)                       |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 114.680       | 0.0                                                                                 | 155.0                  | 19                                     |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 77.440        | 0.0                                                                                 | 209.8                  | 34                                     |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 49.937        | 0.0                                                                                 | 275.1                  | 64                                     |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 31.091        | 0.0                                                                                 | 342.7                  | 122                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 23.207        | 0.0                                                                                 | 383.7                  | 182                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 18.718        | 0.0                                                                                 | 412.6                  | 242                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 13.796        | 0.0                                                                                 | 456.0                  | 362                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11.103        | 0.0                                                                                 | 489.1                  | 480                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8.158         | 0.0                                                                                 | 538.4                  | 684                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6.546         | 0.0                                                                                 | 574.9                  | 790                                    |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4.790         | 0.0                                                                                 | 625.5                  | 1050                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.498         | 0.0                                                                                 | 697.3                  | 1468                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.794         | 0.0                                                                                 | 742.6                  | 1876                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.032         | 0.0                                                                                 | 809.6                  | 2680                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |     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  |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.619         | 0.0                                                                                 | 862.1                  | 3400                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.358         | 0.0                                                                                 | 903.3                  | 4104                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.177         | 0.0                                                                                 | 939.0                  | 4760                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.042         | 0.0                                                                                 | 969.6                  | 5448                                   |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 114.680       | 0.0                                                                                 | 173.8                  | 19                                     |                   |                 |                        |                   |                   |                 |        |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |
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   |     |     |       |     |               |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                 |       |       |     |     |     |       |     |                  |       |       |     |     |     |       |     |               |       |       |     |     |     |       |     |             |              |                     |                       |                  |               |         |     |       |    |               |        |     |       |    |               |        |     |       |    |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |        |     |       |     |                |       |     |       |     |                |       |     |       |     |                |       |     |       |     |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                 |       |     |       |      |                  |       |     |       |      |               |         |     |       |    |

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Micro Drainage

Joseph's Well  
Hanover Walk  
Leeds, LS3 1AB

Date 12/11/2020 12:05  
File 2020-11-12 4937 DA6 100...

XP Solutions

Designed by MichaelDarby  
Checked by

Source Control 2020.1

Summary of Results for 100 year Return Period (+30%)

| Storm Event      | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max E Outflow (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-------------------|---------------------|-----------------|--------|
| 30 min Winter    | 0.624         | 0.624         | 0.0                    | 4.7               | 4.7                 | 234.2           | O K    |
| 60 min Winter    | 0.795         | 0.795         | 0.0                    | 4.7               | 4.7                 | 298.2           | O K    |
| 120 min Winter   | 0.964         | 0.964         | 0.0                    | 4.7               | 4.7                 | 361.6           | O K    |
| 180 min Winter   | 1.052         | 1.052         | 0.0                    | 4.7               | 4.7                 | 394.6           | O K    |
| 240 min Winter   | 1.103         | 1.103         | 0.0                    | 4.7               | 4.7                 | 413.8           | O K    |
| 360 min Winter   | 1.162         | 1.162         | 0.0                    | 4.7               | 4.7                 | 435.9           | O K    |
| 480 min Winter   | 1.190         | 1.190         | 0.0                    | 4.7               | 4.7                 | 446.5           | O K    |
| 600 min Winter   | 1.200         | 1.200         | 0.0                    | 4.7               | 4.7                 | 450.4           | O K    |
| 720 min Winter   | 1.199         | 1.199         | 0.0                    | 4.7               | 4.7                 | 450.1           | O K    |
| 960 min Winter   | 1.178         | 1.178         | 0.0                    | 4.7               | 4.7                 | 442.1           | O K    |
| 1440 min Winter  | 1.123         | 1.123         | 0.0                    | 4.7               | 4.7                 | 421.4           | O K    |
| 2160 min Winter  | 1.025         | 1.025         | 0.0                    | 4.7               | 4.7                 | 384.8           | O K    |
| 2880 min Winter  | 0.920         | 0.920         | 0.0                    | 4.7               | 4.7                 | 345.3           | O K    |
| 4320 min Winter  | 0.672         | 0.672         | 0.0                    | 4.7               | 4.7                 | 252.1           | O K    |
| 5760 min Winter  | 0.456         | 0.456         | 0.0                    | 4.7               | 4.7                 | 171.2           | O K    |
| 7200 min Winter  | 0.310         | 0.310         | 0.0                    | 4.7               | 4.7                 | 116.3           | O K    |
| 8640 min Winter  | 0.218         | 0.218         | 0.0                    | 4.5               | 4.5                 | 81.8            | O K    |
| 10080 min Winter | 0.162         | 0.162         | 0.0                    | 4.2               | 4.2                 | 60.6            | O K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 30 min Winter    | 77.440       | 0.0                 | 234.9                 | 33               |
| 60 min Winter    | 49.937       | 0.0                 | 308.2                 | 62               |
| 120 min Winter   | 31.091       | 0.0                 | 383.8                 | 122              |
| 180 min Winter   | 23.207       | 0.0                 | 429.7                 | 180              |
| 240 min Winter   | 18.718       | 0.0                 | 462.0                 | 238              |
| 360 min Winter   | 13.796       | 0.0                 | 510.5                 | 354              |
| 480 min Winter   | 11.103       | 0.0                 | 547.4                 | 468              |
| 600 min Winter   | 9.374        | 0.0                 | 577.1                 | 578              |
| 720 min Winter   | 8.158        | 0.0                 | 602.0                 | 686              |
| 960 min Winter   | 6.546        | 0.0                 | 641.6                 | 892              |
| 1440 min Winter  | 4.790        | 0.0                 | 685.6                 | 1110             |
| 2160 min Winter  | 3.498        | 0.0                 | 781.1                 | 1580             |
| 2880 min Winter  | 2.794        | 0.0                 | 831.8                 | 2044             |
| 4320 min Winter  | 2.032        | 0.0                 | 906.9                 | 2892             |
| 5760 min Winter  | 1.619        | 0.0                 | 965.7                 | 3568             |
| 7200 min Winter  | 1.358        | 0.0                 | 1011.8                | 4184             |
| 8640 min Winter  | 1.177        | 0.0                 | 1051.9                | 4840             |
| 10080 min Winter | 1.042        | 0.0                 | 1086.4                | 5448             |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 12:05<br>File 2020-11-12 4937 DA6 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 0.740

| Time (mins) |     | Area  |
|-------------|-----|-------|
| From:       | To: | (ha)  |
| 0           | 4   | 0.740 |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 12:05<br>File 2020-11-12 4937 DA6 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Model Details

Storage is Online Cover Level (m) 1.950

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 395.0                  | 0.0                         | 1.201     | 1.0                    | 0.0                         |
| 1.200     | 395.0                  | 0.0                         | 1.950     | 1.0                    | 0.0                         |

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0099-4700-1200-4700  
Design Head (m) 1.200  
Design Flow (l/s) 4.7  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Application Surface  
Sump Available Yes  
Diameter (mm) 99  
Invert Level (m) 0.000  
Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1200

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.200    | 4.7        |
| Flush-Flo™                | 0.356    | 4.7        |
| Kick-Flo®                 | 0.746    | 3.8        |
| Mean Flow over Head Range | -        | 4.1        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 3.3        | 1.200     | 4.7        | 3.000     | 7.2        | 7.000     | 10.8       |
| 0.200     | 4.4        | 1.400     | 5.0        | 3.500     | 7.7        | 7.500     | 11.1       |
| 0.300     | 4.7        | 1.600     | 5.4        | 4.000     | 8.3        | 8.000     | 11.5       |
| 0.400     | 4.7        | 1.800     | 5.7        | 4.500     | 8.7        | 8.500     | 11.8       |
| 0.500     | 4.6        | 2.000     | 6.0        | 5.000     | 9.2        | 9.000     | 12.1       |
| 0.600     | 4.4        | 2.200     | 6.2        | 5.500     | 9.6        | 9.500     | 12.4       |
| 0.800     | 3.9        | 2.400     | 6.5        | 6.000     | 10.0       |           |            |
| 1.000     | 4.3        | 2.600     | 6.7        | 6.500     | 10.4       |           |            |

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|                                                          |                     |                                                                                     |                                          |                                  |                         |                                    |        |
|----------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|-------------------------|------------------------------------|--------|
| Weetwood                                                 |                     | Page 1                                                                              |                                          |                                  |                         |                                    |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                     |  |                                          |                                  |                         |                                    |        |
| Date 12/11/2020 12:11<br>File 2020-11-12 4937 DA7 100... |                     |                                                                                     |                                          |                                  |                         |                                    |        |
| Designed by MichaelDarby<br>Checked by                   |                     |                                                                                     |                                          |                                  |                         |                                    |        |
| XP Solutions                                             |                     | Source Control 2020.1                                                               |                                          |                                  |                         |                                    |        |
| Summary of Results for 100 year Return Period (+30%)     |                     |                                                                                     |                                          |                                  |                         |                                    |        |
| Half Drain Time : 829 minutes.                           |                     |                                                                                     |                                          |                                  |                         |                                    |        |
| Storm<br>Event                                           | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                                                                 | Max<br>Infiltration<br>(1/s)             | Max<br>Control $\Sigma$<br>(1/s) | Max<br>Outflow<br>(1/s) | Max<br>Volume<br>(m <sup>3</sup> ) | Status |
| 15 min Summer                                            | 0.267               | 0.267                                                                               | 0.0                                      | 2.8                              | 2.8                     | 92.7                               | O K    |
| 30 min Summer                                            | 0.358               | 0.358                                                                               | 0.0                                      | 2.8                              | 2.8                     | 124.1                              | O K    |
| 60 min Summer                                            | 0.454               | 0.454                                                                               | 0.0                                      | 2.8                              | 2.8                     | 157.5                              | O K    |
| 120 min Summer                                           | 0.550               | 0.550                                                                               | 0.0                                      | 2.8                              | 2.8                     | 190.7                              | O K    |
| 180 min Summer                                           | 0.601               | 0.601                                                                               | 0.0                                      | 2.8                              | 2.8                     | 208.3                              | O K    |
| 240 min Summer                                           | 0.631               | 0.631                                                                               | 0.0                                      | 2.8                              | 2.8                     | 218.8                              | O K    |
| 360 min Summer                                           | 0.666               | 0.666                                                                               | 0.0                                      | 2.8                              | 2.8                     | 230.9                              | O K    |
| 480 min Summer                                           | 0.682               | 0.682                                                                               | 0.0                                      | 2.8                              | 2.8                     | 236.6                              | O K    |
| 600 min Summer                                           | 0.688               | 0.688                                                                               | 0.0                                      | 2.8                              | 2.8                     | 238.5                              | O K    |
| 720 min Summer                                           | 0.686               | 0.686                                                                               | 0.0                                      | 2.8                              | 2.8                     | 238.0                              | O K    |
| 960 min Summer                                           | 0.676               | 0.676                                                                               | 0.0                                      | 2.8                              | 2.8                     | 234.4                              | O K    |
| 1440 min Summer                                          | 0.648               | 0.648                                                                               | 0.0                                      | 2.8                              | 2.8                     | 224.8                              | O K    |
| 2160 min Summer                                          | 0.595               | 0.595                                                                               | 0.0                                      | 2.8                              | 2.8                     | 206.4                              | O K    |
| 2880 min Summer                                          | 0.541               | 0.541                                                                               | 0.0                                      | 2.8                              | 2.8                     | 187.5                              | O K    |
| 4320 min Summer                                          | 0.443               | 0.443                                                                               | 0.0                                      | 2.8                              | 2.8                     | 153.6                              | O K    |
| 5760 min Summer                                          | 0.359               | 0.359                                                                               | 0.0                                      | 2.8                              | 2.8                     | 124.5                              | O K    |
| 7200 min Summer                                          | 0.291               | 0.291                                                                               | 0.0                                      | 2.8                              | 2.8                     | 100.9                              | O K    |
| 8640 min Summer                                          | 0.238               | 0.238                                                                               | 0.0                                      | 2.8                              | 2.8                     | 82.7                               | O K    |
| 10080 min Summer                                         | 0.198               | 0.198                                                                               | 0.0                                      | 2.7                              | 2.7                     | 68.6                               | O K    |
| 15 min Winter                                            | 0.300               | 0.300                                                                               | 0.0                                      | 2.8                              | 2.8                     | 104.0                              | O K    |
| Storm<br>Event                                           | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m <sup>3</sup> )                                              | Discharge<br>Volume<br>(m <sup>3</sup> ) | Time-Peak<br>(mins)              |                         |                                    |        |
| 15 min Summer                                            | 114.680             | 0.0                                                                                 | 90.8                                     | 19                               |                         |                                    |        |
| 30 min Summer                                            | 77.440              | 0.0                                                                                 | 123.1                                    | 34                               |                         |                                    |        |
| 60 min Summer                                            | 49.937              | 0.0                                                                                 | 162.9                                    | 64                               |                         |                                    |        |
| 120 min Summer                                           | 31.091              | 0.0                                                                                 | 203.0                                    | 122                              |                         |                                    |        |
| 180 min Summer                                           | 23.207              | 0.0                                                                                 | 227.3                                    | 182                              |                         |                                    |        |
| 240 min Summer                                           | 18.718              | 0.0                                                                                 | 244.4                                    | 242                              |                         |                                    |        |
| 360 min Summer                                           | 13.796              | 0.0                                                                                 | 270.0                                    | 362                              |                         |                                    |        |
| 480 min Summer                                           | 11.103              | 0.0                                                                                 | 289.5                                    | 482                              |                         |                                    |        |
| 600 min Summer                                           | 9.374               | 0.0                                                                                 | 305.2                                    | 600                              |                         |                                    |        |
| 720 min Summer                                           | 8.158               | 0.0                                                                                 | 318.4                                    | 720                              |                         |                                    |        |
| 960 min Summer                                           | 6.546               | 0.0                                                                                 | 339.6                                    | 830                              |                         |                                    |        |
| 1440 min Summer                                          | 4.790               | 0.0                                                                                 | 367.9                                    | 1084                             |                         |                                    |        |
| 2160 min Summer                                          | 3.498               | 0.0                                                                                 | 414.1                                    | 1472                             |                         |                                    |        |
| 2880 min Summer                                          | 2.794               | 0.0                                                                                 | 441.0                                    | 1848                             |                         |                                    |        |
| 4320 min Summer                                          | 2.032               | 0.0                                                                                 | 480.5                                    | 2636                             |                         |                                    |        |
| 5760 min Summer                                          | 1.619               | 0.0                                                                                 | 512.4                                    | 3392                             |                         |                                    |        |
| 7200 min Summer                                          | 1.358               | 0.0                                                                                 | 536.8                                    | 4104                             |                         |                                    |        |
| 8640 min Summer                                          | 1.177               | 0.0                                                                                 | 557.9                                    | 4760                             |                         |                                    |        |
| 10080 min Summer                                         | 1.042               | 0.0                                                                                 | 575.8                                    | 5448                             |                         |                                    |        |
| 15 min Winter                                            | 114.680             | 0.0                                                                                 | 101.9                                    | 19                               |                         |                                    |        |
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|                                                          |                     |                           |                              |                                        |                           |                       |                                                                                     |  |
|----------------------------------------------------------|---------------------|---------------------------|------------------------------|----------------------------------------|---------------------------|-----------------------|-------------------------------------------------------------------------------------|--|
| Weetwood                                                 |                     |                           |                              |                                        |                           |                       | Page 2                                                                              |  |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                     |                           |                              |                                        |                           |                       |  |  |
| Date 12/11/2020 12:11<br>File 2020-11-12 4937 DA7 100... |                     |                           |                              | Designed by MichaelDarby<br>Checked by |                           |                       |                                                                                     |  |
| XP Solutions                                             |                     |                           |                              | Source Control 2020.1                  |                           |                       |                                                                                     |  |
| Summary of Results for 100 year Return Period (+30%)     |                     |                           |                              |                                        |                           |                       |                                                                                     |  |
| Storm<br>Event                                           | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s)                | Max<br>E Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status                                                                              |  |
| 30 min Winter                                            | 0.402               | 0.402                     | 0.0                          | 2.8                                    | 2.8                       | 139.4                 | O K                                                                                 |  |
| 60 min Winter                                            | 0.511               | 0.511                     | 0.0                          | 2.8                                    | 2.8                       | 177.2                 | O K                                                                                 |  |
| 120 min Winter                                           | 0.621               | 0.621                     | 0.0                          | 2.8                                    | 2.8                       | 215.5                 | O K                                                                                 |  |
| 180 min Winter                                           | 0.681               | 0.681                     | 0.0                          | 2.8                                    | 2.8                       | 236.0                 | O K                                                                                 |  |
| 240 min Winter                                           | 0.716               | 0.716                     | 0.0                          | 2.8                                    | 2.8                       | 248.1                 | O K                                                                                 |  |
| 360 min Winter                                           | 0.757               | 0.757                     | 0.0                          | 2.8                                    | 2.8                       | 262.5                 | O K                                                                                 |  |
| 480 min Winter                                           | 0.779               | 0.779                     | 0.0                          | 2.8                                    | 2.8                       | 270.0                 | O K                                                                                 |  |
| 600 min Winter                                           | 0.789               | 0.789                     | 0.0                          | 2.8                                    | 2.8                       | 273.4                 | O K                                                                                 |  |
| 720 min Winter                                           | 0.791               | 0.791                     | 0.0                          | 2.8                                    | 2.8                       | 274.2                 | O K                                                                                 |  |
| 960 min Winter                                           | 0.782               | 0.782                     | 0.0                          | 2.8                                    | 2.8                       | 271.1                 | O K                                                                                 |  |
| 1440 min Winter                                          | 0.745               | 0.745                     | 0.0                          | 2.8                                    | 2.8                       | 258.3                 | O K                                                                                 |  |
| 2160 min Winter                                          | 0.681               | 0.681                     | 0.0                          | 2.8                                    | 2.8                       | 236.0                 | O K                                                                                 |  |
| 2880 min Winter                                          | 0.599               | 0.599                     | 0.0                          | 2.8                                    | 2.8                       | 207.8                 | O K                                                                                 |  |
| 4320 min Winter                                          | 0.440               | 0.440                     | 0.0                          | 2.8                                    | 2.8                       | 152.7                 | O K                                                                                 |  |
| 5760 min Winter                                          | 0.316               | 0.316                     | 0.0                          | 2.8                                    | 2.8                       | 109.7                 | O K                                                                                 |  |
| 7200 min Winter                                          | 0.227               | 0.227                     | 0.0                          | 2.8                                    | 2.8                       | 78.8                  | O K                                                                                 |  |
| 8640 min Winter                                          | 0.168               | 0.168                     | 0.0                          | 2.6                                    | 2.6                       | 58.2                  | O K                                                                                 |  |
| 10080 min Winter                                         | 0.129               | 0.129                     | 0.0                          | 2.5                                    | 2.5                       | 44.7                  | O K                                                                                 |  |
| Storm<br>Event                                           | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³)  | Time-Peak<br>(mins)                    |                           |                       |                                                                                     |  |
| 30 min Winter                                            | 77.440              | 0.0                       | 137.9                        | 33                                     |                           |                       |                                                                                     |  |
| 60 min Winter                                            | 49.937              | 0.0                       | 182.5                        | 62                                     |                           |                       |                                                                                     |  |
| 120 min Winter                                           | 31.091              | 0.0                       | 227.4                        | 122                                    |                           |                       |                                                                                     |  |
| 180 min Winter                                           | 23.207              | 0.0                       | 254.5                        | 180                                    |                           |                       |                                                                                     |  |
| 240 min Winter                                           | 18.718              | 0.0                       | 273.6                        | 238                                    |                           |                       |                                                                                     |  |
| 360 min Winter                                           | 13.796              | 0.0                       | 302.1                        | 354                                    |                           |                       |                                                                                     |  |
| 480 min Winter                                           | 11.103              | 0.0                       | 323.8                        | 470                                    |                           |                       |                                                                                     |  |
| 600 min Winter                                           | 9.374               | 0.0                       | 341.1                        | 582                                    |                           |                       |                                                                                     |  |
| 720 min Winter                                           | 8.158               | 0.0                       | 355.5                        | 692                                    |                           |                       |                                                                                     |  |
| 960 min Winter                                           | 6.546               | 0.0                       | 378.0                        | 906                                    |                           |                       |                                                                                     |  |
| 1440 min Winter                                          | 4.790               | 0.0                       | 398.5                        | 1140                                   |                           |                       |                                                                                     |  |
| 2160 min Winter                                          | 3.498               | 0.0                       | 463.8                        | 1604                                   |                           |                       |                                                                                     |  |
| 2880 min Winter                                          | 2.794               | 0.0                       | 493.9                        | 2048                                   |                           |                       |                                                                                     |  |
| 4320 min Winter                                          | 2.032               | 0.0                       | 538.3                        | 2812                                   |                           |                       |                                                                                     |  |
| 5760 min Winter                                          | 1.619               | 0.0                       | 573.9                        | 3528                                   |                           |                       |                                                                                     |  |
| 7200 min Winter                                          | 1.358               | 0.0                       | 601.3                        | 4184                                   |                           |                       |                                                                                     |  |
| 8640 min Winter                                          | 1.177               | 0.0                       | 625.0                        | 4848                                   |                           |                       |                                                                                     |  |
| 10080 min Winter                                         | 1.042               | 0.0                       | 645.3                        | 5448                                   |                           |                       |                                                                                     |  |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 12:11<br>File 2020-11-12 4937 DA7 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 0.440

| Time (mins) |     | Area  |
|-------------|-----|-------|
| From:       | To: | (ha)  |
| 0           | 4   | 0.440 |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 12:11<br>File 2020-11-12 4937 DA7 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Model Details

Storage is Online Cover Level (m) 1.550

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 365.0                  | 0.0                         | 0.801     | 1.0                    | 0.0                         |
| 0.800     | 365.0                  | 0.0                         | 1.550     | 1.0                    | 0.0                         |

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0080-2800-1000-2800  
Design Head (m) 1.000  
Design Flow (l/s) 2.8  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Application Surface  
Sump Available Yes  
Diameter (mm) 80  
Invert Level (m) 0.000  
Minimum Outlet Pipe Diameter (mm) 100  
Suggested Manhole Diameter (mm) 1200

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 2.8        |
| Flush-Flo™                | 0.299    | 2.8        |
| Kick-Flo®                 | 0.623    | 2.3        |
| Mean Flow over Head Range | -        | 2.5        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 2.3        | 1.200     | 3.0        | 3.000     | 4.7        | 7.000     | 6.9        |
| 0.200     | 2.7        | 1.400     | 3.3        | 3.500     | 5.0        | 7.500     | 7.2        |
| 0.300     | 2.8        | 1.600     | 3.5        | 4.000     | 5.3        | 8.000     | 7.4        |
| 0.400     | 2.8        | 1.800     | 3.7        | 4.500     | 5.6        | 8.500     | 7.6        |
| 0.500     | 2.6        | 2.000     | 3.9        | 5.000     | 5.9        | 9.000     | 7.8        |
| 0.600     | 2.4        | 2.200     | 4.0        | 5.500     | 6.2        | 9.500     | 8.0        |
| 0.800     | 2.5        | 2.400     | 4.2        | 6.000     | 6.4        |           |            |
| 1.000     | 2.8        | 2.600     | 4.4        | 6.500     | 6.7        |           |            |

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|                                                      |                     |                           |                                                                                     |                       |        |  |
|------------------------------------------------------|---------------------|---------------------------|-------------------------------------------------------------------------------------|-----------------------|--------|--|
| Weetwood                                             |                     |                           |                                                                                     |                       | Page 1 |  |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB      |                     |                           |  |                       |        |  |
| Date 12/11/2020 11:24                                |                     |                           |                                                                                     |                       |        |  |
| File 2020-11-12 4937 DA8 100...                      |                     |                           |                                                                                     |                       |        |  |
| Designed by MichaelDarby                             |                     |                           | Checked by                                                                          |                       |        |  |
| XP Solutions                                         |                     |                           | Source Control 2020.1                                                               |                       |        |  |
| Summary of Results for 100 year Return Period (+30%) |                     |                           |                                                                                     |                       |        |  |
| Storm<br>Event                                       | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Control<br>(l/s)                                                             | Max<br>Volume<br>(m³) | Status |  |
| 15 min Summer                                        | 0.378               | 0.378                     | 10.6                                                                                | 354.2                 | O K    |  |
| 30 min Summer                                        | 0.497               | 0.497                     | 10.6                                                                                | 475.3                 | O K    |  |
| 60 min Summer                                        | 0.619               | 0.619                     | 10.6                                                                                | 604.6                 | O K    |  |
| 120 min Summer                                       | 0.737               | 0.737                     | 10.6                                                                                | 734.4                 | O K    |  |
| 180 min Summer                                       | 0.796               | 0.796                     | 10.6                                                                                | 801.0                 | O K    |  |
| 240 min Summer                                       | 0.829               | 0.829                     | 10.6                                                                                | 839.3                 | O K    |  |
| 360 min Summer                                       | 0.866               | 0.866                     | 10.6                                                                                | 882.0                 | O K    |  |
| 480 min Summer                                       | 0.882               | 0.882                     | 10.6                                                                                | 900.9                 | O K    |  |
| 600 min Summer                                       | 0.886               | 0.886                     | 10.6                                                                                | 905.6                 | O K    |  |
| 720 min Summer                                       | 0.883               | 0.883                     | 10.6                                                                                | 902.1                 | O K    |  |
| 960 min Summer                                       | 0.873               | 0.873                     | 10.6                                                                                | 890.5                 | O K    |  |
| 1440 min Summer                                      | 0.845               | 0.845                     | 10.6                                                                                | 857.6                 | O K    |  |
| 2160 min Summer                                      | 0.795               | 0.795                     | 10.6                                                                                | 799.7                 | O K    |  |
| 2880 min Summer                                      | 0.741               | 0.741                     | 10.6                                                                                | 738.3                 | O K    |  |
| 4320 min Summer                                      | 0.617               | 0.617                     | 10.6                                                                                | 601.8                 | O K    |  |
| 5760 min Summer                                      | 0.504               | 0.504                     | 10.6                                                                                | 481.8                 | O K    |  |
| 7200 min Summer                                      | 0.408               | 0.408                     | 10.6                                                                                | 383.8                 | O K    |  |
| 8640 min Summer                                      | 0.331               | 0.331                     | 10.6                                                                                | 306.8                 | O K    |  |
| 10080 min Summer                                     | 0.271               | 0.271                     | 10.5                                                                                | 248.9                 | O K    |  |
| 15 min Winter                                        | 0.422               | 0.422                     | 10.6                                                                                | 397.6                 | O K    |  |
| 30 min Winter                                        | 0.553               | 0.553                     | 10.6                                                                                | 533.9                 | O K    |  |
| Storm<br>Event                                       | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³)                                                         | Time-Peak<br>(mins)   |        |  |
| 15 min Summer                                        | 114.680             | 0.0                       | 346.5                                                                               | 22                    |        |  |
| 30 min Summer                                        | 77.440              | 0.0                       | 470.0                                                                               | 37                    |        |  |
| 60 min Summer                                        | 49.937              | 0.0                       | 623.8                                                                               | 66                    |        |  |
| 120 min Summer                                       | 31.091              | 0.0                       | 777.4                                                                               | 126                   |        |  |
| 180 min Summer                                       | 23.207              | 0.0                       | 870.5                                                                               | 184                   |        |  |
| 240 min Summer                                       | 18.718              | 0.0                       | 936.1                                                                               | 244                   |        |  |
| 360 min Summer                                       | 13.796              | 0.0                       | 1034.3                                                                              | 362                   |        |  |
| 480 min Summer                                       | 11.103              | 0.0                       | 1109.1                                                                              | 482                   |        |  |
| 600 min Summer                                       | 9.374               | 0.0                       | 1169.4                                                                              | 600                   |        |  |
| 720 min Summer                                       | 8.158               | 0.0                       | 1219.8                                                                              | 686                   |        |  |
| 960 min Summer                                       | 6.546               | 0.0                       | 1301.0                                                                              | 794                   |        |  |
| 1440 min Summer                                      | 4.790               | 0.0                       | 1410.0                                                                              | 1050                  |        |  |
| 2160 min Summer                                      | 3.498               | 0.0                       | 1588.5                                                                              | 1468                  |        |  |
| 2880 min Summer                                      | 2.794               | 0.0                       | 1691.4                                                                              | 1876                  |        |  |
| 4320 min Summer                                      | 2.032               | 0.0                       | 1842.7                                                                              | 2676                  |        |  |
| 5760 min Summer                                      | 1.619               | 0.0                       | 1966.3                                                                              | 3400                  |        |  |
| 7200 min Summer                                      | 1.358               | 0.0                       | 2059.9                                                                              | 4104                  |        |  |
| 8640 min Summer                                      | 1.177               | 0.0                       | 2140.6                                                                              | 4760                  |        |  |
| 10080 min Summer                                     | 1.042               | 0.0                       | 2208.7                                                                              | 5448                  |        |  |
| 15 min Winter                                        | 114.680             | 0.0                       | 389.0                                                                               | 22                    |        |  |
| 30 min Winter                                        | 77.440              | 0.0                       | 526.4                                                                               | 36                    |        |  |
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|                                                          |                     |                                        |                             |                                                                                     |        |
|----------------------------------------------------------|---------------------|----------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|--------|
| Weetwood                                                 |                     |                                        |                             | Page 2                                                                              |        |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                     |                                        |                             |  |        |
| Date 12/11/2020 11:24<br>File 2020-11-12 4937 DA8 100... |                     | Designed by MichaelDarby<br>Checked by |                             |                                                                                     |        |
| XP Solutions                                             |                     | Source Control 2020.1                  |                             |                                                                                     |        |
| Summary of Results for 100 year Return Period (+30%)     |                     |                                        |                             |                                                                                     |        |
| Storm<br>Event                                           | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                    | Max<br>Control<br>(l/s)     | Max<br>Volume<br>(m³)                                                               | Status |
| 60 min Winter                                            | 0.689               | 0.689                                  | 10.6                        | 680.7                                                                               | O K    |
| 120 min Winter                                           | 0.819               | 0.819                                  | 10.6                        | 827.3                                                                               | O K    |
| 180 min Winter                                           | 0.885               | 0.885                                  | 10.6                        | 904.2                                                                               | O K    |
| 240 min Winter                                           | 0.923               | 0.923                                  | 10.6                        | 949.5                                                                               | O K    |
| 360 min Winter                                           | 0.968               | 0.968                                  | 10.6                        | 1002.5                                                                              | O K    |
| 480 min Winter                                           | 0.990               | 0.990                                  | 10.6                        | 1029.0                                                                              | O K    |
| 600 min Winter                                           | 0.999               | 0.999                                  | 10.6                        | 1040.0                                                                              | O K    |
| 720 min Winter                                           | 0.999               | 0.999                                  | 10.6                        | 1041.1                                                                              | O K    |
| 960 min Winter                                           | 0.987               | 0.987                                  | 10.6                        | 1025.9                                                                              | O K    |
| 1440 min Winter                                          | 0.950               | 0.950                                  | 10.6                        | 981.4                                                                               | O K    |
| 2160 min Winter                                          | 0.881               | 0.881                                  | 10.6                        | 899.8                                                                               | O K    |
| 2880 min Winter                                          | 0.803               | 0.803                                  | 10.6                        | 809.4                                                                               | O K    |
| 4320 min Winter                                          | 0.617               | 0.617                                  | 10.6                        | 601.8                                                                               | O K    |
| 5760 min Winter                                          | 0.443               | 0.443                                  | 10.6                        | 419.0                                                                               | O K    |
| 7200 min Winter                                          | 0.309               | 0.309                                  | 10.6                        | 285.2                                                                               | O K    |
| 8640 min Winter                                          | 0.220               | 0.220                                  | 10.4                        | 200.2                                                                               | O K    |
| 10080 min Winter                                         | 0.169               | 0.169                                  | 10.0                        | 152.6                                                                               | O K    |
| Storm<br>Event                                           | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)              | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins)                                                                 |        |
| 60 min Winter                                            | 49.937              | 0.0                                    | 699.1                       | 66                                                                                  |        |
| 120 min Winter                                           | 31.091              | 0.0                                    | 870.9                       | 124                                                                                 |        |
| 180 min Winter                                           | 23.207              | 0.0                                    | 975.0                       | 182                                                                                 |        |
| 240 min Winter                                           | 18.718              | 0.0                                    | 1048.2                      | 240                                                                                 |        |
| 360 min Winter                                           | 13.796              | 0.0                                    | 1157.7                      | 356                                                                                 |        |
| 480 min Winter                                           | 11.103              | 0.0                                    | 1240.8                      | 470                                                                                 |        |
| 600 min Winter                                           | 9.374               | 0.0                                    | 1307.3                      | 582                                                                                 |        |
| 720 min Winter                                           | 8.158               | 0.0                                    | 1362.7                      | 690                                                                                 |        |
| 960 min Winter                                           | 6.546               | 0.0                                    | 1449.7                      | 894                                                                                 |        |
| 1440 min Winter                                          | 4.790               | 0.0                                    | 1542.7                      | 1114                                                                                |        |
| 2160 min Winter                                          | 3.498               | 0.0                                    | 1779.4                      | 1580                                                                                |        |
| 2880 min Winter                                          | 2.794               | 0.0                                    | 1894.5                      | 2044                                                                                |        |
| 4320 min Winter                                          | 2.032               | 0.0                                    | 2064.3                      | 2860                                                                                |        |
| 5760 min Winter                                          | 1.619               | 0.0                                    | 2202.7                      | 3576                                                                                |        |
| 7200 min Winter                                          | 1.358               | 0.0                                    | 2307.7                      | 4184                                                                                |        |
| 8640 min Winter                                          | 1.177               | 0.0                                    | 2398.4                      | 4832                                                                                |        |
| 10080 min Winter                                         | 1.042               | 0.0                                    | 2475.6                      | 5344                                                                                |        |
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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 3                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:24<br>File 2020-11-12 4937 DA8 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
| XP Solutions Source Control 2020.1                       |                                        |                                                                                     |

Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.341             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

Time Area Diagram

Total Area (ha) 1.689

| Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 1.000 | 4 8         | 0.689 |

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|                                                          |                                        |                                                                                     |
|----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Weetwood                                                 |                                        | Page 4                                                                              |
| Joseph's Well<br>Hanover Walk<br>Leeds, LS3 1AB          |                                        |  |
| Date 12/11/2020 11:24<br>File 2020-11-12 4937 DA8 100... | Designed by MichaelDarby<br>Checked by |                                                                                     |
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Model Details

Storage is Online Cover Level (m) 1.300

Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 875.0                  | 1.300     | 1331.7                 |

Hydro-Brake® Optimum Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0150-1060-1000-1060 |
| Design Head (m)                   | 1.000                      |
| Design Flow (l/s)                 | 10.6                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 150                        |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 225                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 10.6       |
| Flush-Flo™                | 0.309    | 10.6       |
| Kick-Flo®                 | 0.682    | 8.8        |
| Mean Flow over Head Range | -        | 9.1        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 5.4        | 1.200     | 11.5       | 3.000     | 17.8       | 7.000     | 26.7       |
| 0.200     | 10.2       | 1.400     | 12.4       | 3.500     | 19.2       | 7.500     | 27.6       |
| 0.300     | 10.6       | 1.600     | 13.2       | 4.000     | 20.4       | 8.000     | 28.5       |
| 0.400     | 10.5       | 1.800     | 14.0       | 4.500     | 21.6       | 8.500     | 29.4       |
| 0.500     | 10.2       | 2.000     | 14.7       | 5.000     | 22.7       | 9.000     | 30.2       |
| 0.600     | 9.8        | 2.200     | 15.4       | 5.500     | 23.8       | 9.500     | 31.0       |
| 0.800     | 9.5        | 2.400     | 16.0       | 6.000     | 24.8       |           |            |
| 1.000     | 10.6       | 2.600     | 16.6       | 6.500     | 25.8       |           |            |

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