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North Lincolnshire Green Energy Park

Indicative Drainage Strategy

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Contents

| Co | ontent | S | i |
|----|--------|--|----|
| 1 | Intro | duction | 1 |
| | 1.1 | Background | 1 |
| | 1.2 | Project Description | 1 |
| 2 | Site C | Context: Statutory & Non-Statutory Policies and Guidance | 5 |
| 3 | Site D | Description | 6 |
| | 3.1 | Existing Site | 6 |
| | 3.2 | Existing Topography | 7 |
| | 3.3 | Existing Waterbodies | 9 |
| | 3.4 | Existing Drainage | 9 |
| 4 | Propo | osed Surface Water Drainage Strategy | 17 |
| | 4.1 | General | 17 |
| | 4.2 | Surface Water Disposal | 17 |
| | 4.3 | Watershed | 18 |
| | 4.4 | Consultation | 18 |
| | 4.5 | Sustainable Drainage Systems (SuDS) | 18 |
| | 4.6 | Climate Change | 23 |
| | 4.7 | Pollution Control | 24 |
| | 4.8 | Proposed Strategy | 26 |
| | 4.9 | Diverted Ditch | 33 |
| | 4.10 | Designing for Exceedance | 36 |
| | 4.11 | Easements | 38 |
| | 4.12 | Maintenance | 38 |
| 5 | Propo | osed Foul Water Drainage Strategy | 39 |

| 5.1 | General | 39 |
|---------|--|--------|
| 5.2 | Severn Trent Consultation | 39 |
| 5.3 | Proposed Strategy | 39 |
| Table o | f Tables | |
| Table 3 | -1: Ditch properties. | 11 |
| Table 3 | -2 Existing ditches capacity check | 16 |
| Table 4 | -1 SuDS Techniques. | 19 |
| Table 4 | -2-Peak rainfall intensity allowance in small and urban catchments | (based |
| on a 19 | 61 to 1990 baseline). | 23 |
| Table 4 | -3 Mitigation indices of proposed SuDS components. | 24 |
| Table 4 | -4 Pollution hazard indices of areas within the Application Land. | 24 |
| Table 4 | -5: Areas and allowed discharge for each catchment. | 27 |
| Table 4 | -6: Percentage Impermeable proportion assumptions. | 27 |
| Table 4 | -7: Summary of SuDS storage designs. | 28 |
| Table 4 | -8 Maintenance and ownership | 38 |
| | | |
| Table o | f Figures | |

| Figure 1-1 – the Project Location. | 4 |
|---|----|
| Figure 3-1 Existing Topography. | 8 |
| Figure 3-2: Plan of existing ditches on the Energy Park Land. | 10 |
| Figure 3-3: Existing Ditches | 15 |
| Figure 4-1 Example Detention Basin. | 22 |
| Figure 4-2 Example Swale. | 23 |
| Figure 4-3: Catchment Plan. | 29 |
| Figure 4-4: Proposed SuDS Features. | 30 |
| Figure 4-5: Image of ditch to be diverted. | 34 |
| Figure 4-6: Proposed ditch diversion route. | 35 |
| Figure 4-7: Exceedance Flow Routes. | 37 |
| | |

1 Introduction

1.1 Background

- 1.1.1 This report has been prepared by Buro Happold on behalf of The North Lincolnshire Green Energy Park Ltd. ('the Applicant'). Identified as a Nationally Significant Infrastructure Project (NSIP), the North Lincolnshire Green Energy Park (NLGEP) ('the Project') is being brought forward for planning under a Development Consent Order (DCO).
- 1.1.2 This drainage strategy should be read as supplementary information to the Flood Risk Assessment (**Document Reference 6.3.3**) for the Project.

1.2 Project Description

- 1.2.1 The North Lincolnshire Green Energy Park (NLGEP) ('the Project'), located at Flixborough, North Lincolnshire, is a Nationally Significant Infrastructure Project (NSIP) with an Energy Recovery Facility (ERF) capable of converting up to 760,000 tonnes of non-recyclable waste into 95 MW of electricity at its heart and a carbon capture, utilisation and storage (CCUS) facility which will treat the excess gasses released from the ERF to remove and store carbon dioxide (CO₂) prior to emission into the atmosphere.
- 1.2.2 The NSIP incorporates a switchyard, to ensure that the power created can be exported to the National Grid or to local businesses, and a water treatment facility, to take water from the mains supply or recycled process water to remove impurities and make it suitable for use in the boilers, the CCUS facility, concrete block manufacture, hydrogen production and the maintenance of the water levels in the wetland area.
- 1.2.3 The Project will include the following Associated Development to support the operation of the NSIP:
 - a bottom ash and flue gas residue handling and treatment facility (RHTF)
 - a concrete block manufacturing facility (CBMF)
 - a plastic recycling facility (PRF)
 - a hydrogen production and storage facility
 - an electric vehicle (EV) and hydrogen (H2) refuelling station
 - battery storage
 - a hydrogen and natural gas above ground installations (AGI)
 - a new access road and parking
 - a gatehouse and visitor centre with elevated walkway

- railway reinstatement works including, sidings at Dragonby, reinstatement and safety improvements to the 6km private railway spur, and the construction of a new railhead with sidings south of Flixborough Wharf
- a northern and southern district heating and private wire network (DHPWN)
- habitat creation, landscaping and ecological mitigation, including green infrastructure and 65 acre wetland area
- new public rights of way and cycle ways including footbridges
- Sustainable Drainage Systems (SuDS) and flood defence; and
- utility constructions and diversions.

- 1.2.4 Refer to Appendix B for a figure showing an overview of the Project.
- 1.2.5 The Project will also include development in connection with the above works such as security gates, fencing, boundary treatment, lighting, hard and soft landscaping, surface and foul water treatment and drainage systems and CCTV.
- 1.2.6 The Project also includes temporary facilities required during the course of construction, including site establishment and preparation works, temporary construction laydown areas, contractor facilities, materials and plant storage, generators, concrete batching facilities, vehicle and cycle parking facilities, offices, staff welfare facilities, security fencing and gates, external lighting, roadways and haul routes, wheel wash facilities, and signage.
- 1.2.7 The Application land encompasses an area within and adjacent to Flixborough Port (RMS Trent Ports) on the east bank of the River Trent. The Flixborough Port and Flixborough Industrial Estate together form an industrial complex that has supported a range of businesses and industrial activities since the early 1900s. Existing infrastructure at the site includes roads, a rail spur, a 155m long wharf, weigh bridge, cranes, warehousing and stock sheds, workshops and portable offices.
- 1.2.8 The Project will have transport connectivity by road, rail, and river to sea via the River Trent and River Humber, with the latter two used for freight transport only. Land adjacent to the Flixborough Industrial Estate included within the Application Land is currently a mix of both brownfield land and areas used for arable agriculture, comprising a number of fields separated by hedgerows and well established drainage ditches which are maintained by the internal drainage board.
- 1.2.9 The Order Limits and indicative location of the proposed Energy Park buildings are shown on Figure 1-1.



Figure 1-1 – the Project Location.

2 Site Context: Statutory & Non-Statutory Policies and Guidance

National Policy

- 2.1.1 The National Planning Policy Framework (NPPF 2021) provides planning policy from central government. The document states that "...local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment...".
- 2.1.2 Non-Statutory Technical Standards for Sustainable Drainage Systems (TSSuDS) (Department for Environment, Food and Rural Affairs, March 2015) provides guidance for the hydraulic performance of Sustainable Drainage Systems (SuDS) systems to reduce flood risk and improve water quality of water discharging from a development site. The document provides guidance on best practice and is not a statutory requirement for approval.

Planning Policy

2.1.3 In accordance with the North Lincolnshire Local Development Framework consideration of sustainable drainage systems and surface water attenuation methodologies are required. The SuDS and Flood Risk Guidance Document (April 2017) describes the requirements that must be met by the developers to avoid increasing the risk of flooding to the site and the surrounding areas.

3 Site Description

3.1 Existing Site

- 3.1.1 The existing site primarily comprises of five main areas, they include:
 - The port area and adjacent steel sheds.
 - Agricultural fields between Stather Road, Phoenix Parkway and Ferry Road West.
 - The disused railway line between Flixborough Port and Drangonby Sidings.
 - Highway link between Phoenix Parkway and Scunthorpe, for district heating and and private wire network (DHPWN) installation only.
 - Highway link between Phoenix Parkway and Lincolnshire lakes scheme, along A1077 and M181, for DHPWN installation.

3.2 Existing Topography

- 3.2.1 Levels across the Energy Park Land containing the core elements of the project (ERF; carbon capture, utilisation and storage facility; bottom ash and flue gas residue handling and treatment facility; concrete block manufacturing facility; plastic recycling facility; hydrogen production and storage facility; electric vehicle (EV) and hydrogen (H2) refuelling station; battery storage and hydrogen and natural gas above ground installations), between Stather Road and Ferry Road West, vary from approximately +5.5 m AOD at the north-eastern corner, to +0.3 m AOD at the southern boundary.
- 3.2.2 Lysaght's Drain provides the lowest point of the Application Land at approximately -1.7 m AOD at the western end where it connects to a pumping station adjacent to the River Trent.
- 3.2.3 Levels to the east of Flixborough Industrial Estate vary from approximately +34 m AOD, in the north-eastern corner, to +4.5 m AOD in the area where the unknown road and Stather Road meets to the west of where the proposed AGI will be located.



Figure 3-1 Existing Topography.

- 3.2.4 The average elevation across the whole Application Land is approximately +2.3 m AOD.
- 3.2.5 Due to the Application Land's large area 10 different catchment areas are identified for the drainage strategy.

3.3 Existing Waterbodies

3.3.1 The River Trent runs adjacent to the western edge of the Application Land and will ultimately be the receiving body for the surface water discharge. There are a number of existing ditches across the Application Land, explained in the following section, and these will be used to convey surface water to the River Trent.

3.4 Existing Drainage

- 3.4.1 Existing drainage across the agricultural areas of the Application Land predominantly consists of land drains. Stather Road drains to either the existing agricultural fields or to adjacent ditches along its length. Whereas a piped drainage system exists within the Flixborough Industrial Estate.
- 3.4.2 The agricultural ditches eventually drain to Lysaght's Drain, which runs east-west through the centre of the Energy Park Land and in turn discharges to the River Trent, via a pumping Station.
- 3.4.3 The existing ditches are shown on plan in Figure 3-2, where the main ditches are numbered for reference. Table 3-1 summarises the length, top width, and flow direction of each ditch. Majority of the ditches have similar cross-sections, however, ditch 4 and 5 has a sheet pile wall on the southern side seen in Figure 3-3.

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Figure 3-2: Plan of existing ditches on the Energy Park Land.

Table 3-1: Ditch properties.

| Ditch Number | Length (m) | Top Width (m) | Flow Direction |
|-----------------|------------|------------------|----------------|
| 1 | 348 | 15.5 | S-N |
| 2 | 278 | 5.0 | E-W |
| 3 | 282 | 5.0 | S-N |
| 4 | 222 | 35.0 | E-W |
| 5 | 692 | 6.0-7.7 | E-W |
| 6 | 590 | 5.0 | N-S |
| 7 | 340 | 6.0 | N-S |
| 8 | 298 | 5.0 | N-S |
| 9 | 230 | 4.0 | E-W |
| 10 | 208 | 2.0 | N-S |





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- 3.4.4 In order to prove that the existing ditches can accommodate the proposed flows, an estimated capacity check has been undertaken and the following assumptions have been made:
 - Geometry of the ditches have been determined from a walk over dated April 2021.
 - Longitudinal slope to be 1:1000
 - Side slopes to be 1:1 except ditch 10 which is 1:2.
 - Manning's n to be 0.035.

Using the Manning formula: $V = \frac{1}{n} R_h^{2/3} S^{1/2}$, the estimated existing capacity of the ditches are shown in Table 3-2:

| Ditch Number | Height (m) | Base Width (m) | Velocity (m/s) | Capacity (l/s) |
|-----------------|------------|-------------------|----------------|----------------|
| 1 | 6.00 | 3.0 | 1.75 | 94,695 |
| 2 | 2.25 | 0.5 | 0.84 | 5,217 |
| 3 | 2.25 | 0.5 | 0.84 | 5,217 |
| 4 | 8.00 | 19.0 | 2.71 | 584,927 |
| 5 | 2.25 | 2.5 | 1.02 | 10,939 |
| 6 | 2.20 | 0.6 | 0.84 | 5, 1 99 |
| 7 | 2.75 | 0.5 | 0.95 | 8,498 |
| 8 | 2.00 | 1.0 | 0.84 | 5,058 |
| 9 | 2.00 | 0.5 | 0.79 | 3,932 |
| 10 | 0.50 | 0.5 | 0.37 | 185 |

Table 3-2 Existing ditches capacity check

3.4.5 Looking at the proposed discharge rates shown on Table 4-5, it can be determined that the existing ditches have enough capacity to accommodate the proposed flows.

4 **Proposed Surface Water Drainage Strategy**

4.1 General

- 4.1.1 The surface water strategy and report have been developed in consultation with North Lincolnshire Council Lead Local Flood Authority and Scunthorpe & Gainsborough WMB.
- 4.1.2 This drainage strategy should be read as supplementary information to the Flood Risk Assessment (**Document Reference 6.3.3**) for the Project.

4.2 Surface Water Disposal

- 4.2.1 Surface water disposal should be in accordance with the drainage hierarchy in Building Regulations Part H 2015. This hierarchy is briefly described below:
 - Step 1. Disposal on Site via infiltration SuDS (Sustainable Drainage Systems)

Infiltration tests are planned to be completed as part of a geotechnical investigation. A desktop study has indicated that potential for infiltration is low and has been considered as zero in the current calculations. The rates will be confirmed by investigation and the design updated as required.

• Step 2. Disposal to a Watercourse

The nearest watercourses are the existing ditches across the Application Land, including Lysaght's Drain, which runs east-west across the agricultural fields between Stather Road and Ferry Road West. Lysaght's drain discharges into the River Trent via a pumping station located adjacent to Stather Road. The strategy for surface water will be to discharge to the existing ditches across the Application Land.

• Step 3. Disposal to a Public Sewer

Not required for this development.

4.3 Watershed

- 4.3.1 As noted in Section 3.2, the Application Land is divided into 10 catchments. The land is generally flat but stormwater from the north-western and south-eastern boundaries slope towards ditches that connect to the central Lysaght's Drain. The proposed drainage strategy is to reflect these catchments, to mimic the existing drainage.
- 4.3.2 As all the catchments are discharging to a water course, the existing greenfield runoff rate has been calculated to comply with requirements set by Scunthorpe & Gainsborough Water Management Board (SGWMB). This flow rate of 1.4 l/s/ha will be used for the Project.

4.4 Consultation

- 4.4.1 North Lincolnshire Council The NLC flood team have been consulted regarding the surface water strategy to include their requirement in the proposed design. Also, a meeting with the Lead Local Flood Authority and the SGWMB was held in May 2021 where the proposed strategy was presented for initial comments. It was confirmed that there are no records of historic flooding in the Order Limits. Refer to Appendix C and D for correspondence and meeting minutes.
- 4.4.2 Scunthorpe & Gainsborough Water Management Board (SGWMB)- A meeting with the SGWMB team was held in October 2020 where it was explained the project and the proposed surface water strategy. SGWMB stated that the proposed discharge rate has to be restricted to the greenfield runoff rate and not exceed 1.4l/s/ha. Refer to Appendix D for meeting minutes with SGWMB.

4.5 Sustainable Drainage Systems (SuDS)

4.5.1 Sustainable Urban Drainage Systems are used to reduce the impact of surface water from storm events on the existing environment mimicking the natural run-off characteristics of the site and removing pollutants from the urban run-off at source. There are various solutions which are described in the SuDS Manual (CIRIA C753) and include ground level features including swales and ponds, below ground systems (such as tanks, and infiltration techniques like soakaways). In addition, there are above ground solutions such as green roofs.

- 4.5.2 The Project considers the use of sustainable drainage techniques in accordance with local policy. The CIRIA SuDS Manual contains a hierarchy of sustainable methods of capturing and storing rainwater in a descending order: from drainage into the ground to recharging water resources. Since infiltration is not possible, surface water will be stored on site in open water features and then released at a controlled rate.
- 4.5.3 Non-infiltration SuDS features will not reduce the amount of surface water discharged; however, it will significantly delay and mitigate the peak flood flows from the Application Land. The hierarchy of SuDS techniques is shown below:
- 4.5.4 The SuDS features included in the design for the Project are listed below.

| | SUDS Technique | Flood Reduction | Pollution Reduction | Landscape & Wildlife Benefit | Suitability for the Project | Comments |
|---------------------|---------------------------|--------------------|------------------------|------------------------------------|-----------------------------------|--|
| Most Sustainable | Living roofs | √ | √ | √ | Νο | Not considered for the infrastructure areas |
| | Basins & √ √ ponds | V | V | Yes | Detention basins and | |
| | Constructed Wetlands | | | | Νο | swales are considered as |
| | Balancing ponds | | | | Νο | the main elements to convey and |
| | Detention basins | | | | Yes | attenuate the surface water generated for the proposed impermeable areas. |
| | Retention ponds | | | | Νο | |
| • | Filter strips & swales | V | V | V | Yes | |

Table 4-1 SuDS Techniques.

| | SUDS Technique | Flood Reduction | Pollution Reduction | Landscape & Wildlife Benefit | Suitability for the Project | Comments |
|----------------------|--------------------------------------|--------------------|------------------------|------------------------------------|-----------------------------------|---|
| | Rain Gardens | V | V | V | Yes | |
| | Infiltration devices | V | V | ~ | Νο | Not considered as |
| | Soakaways | | | | | this stage. |
| Least Sustainable | Infiltration trenches & basins | | | | | Results from ground investigation will determine if this option is available |
| | Permeable surfaces | V | √ | | Yes | To not be considered in the infrastructure areas, as not to adoptable requirements, but to be considered when building infrastructure is developed. |
| | Gravelled areas | | | | Yes | Subject to landscape design |
| | Solid paving blocks | | | | Yes | Subject to landscape design |
| | Porous pavers | | | | Yes | Subject to landscape design |

| SUDS Technique | Flood Reduction | Pollution Reduction | Landscape & Wildlife Benefit | Suitability for the Project | Comments |
|---------------------------|--------------------|------------------------|------------------------------------|-----------------------------------|----------|
| Tanked systems | V | | | Yes | |
| Over-sized pipes/tanks | | | | Yes | |
| Attenuation cells | | | | Yes | |

Detention Basins

- 4.5.5 The detention basins are proposed to be landscaped depressions that are normally dry except during and immediately following storm events. An allowance for topsoil/planting medium will be provided similar to a bio-retention system. The potential amenity/ecological use of the detention basin system allows this space to be flexible and provide multiple benefits to the Application Land.
- 4.5.6 Detention basins allow sedimentation and pollutant removal of the run-off. They will also provide the main source of attenuation across deliver a reduction in discharge volumes due to evapotranspiration.



Figure 4-1 Example Detention Basin.

Swales

4.5.7 Swales are shallow, flat bottomed, potentially vegetated channels designed to convey, treat and attenuate surface water runoff. They are designed to encourage evapotranspiration as well as infiltration to the ground. When incorporated into site design swales can be used to enhance the natural landscape and provide visual and biodiversity benefits. The swales across the Application Land are proposed to be wet swales that convey the surface water runoff to the detention basins where it will be attenuated and to the existing ditches where it will be discharged with restricted flow.



Figure 4-2 Example Swale.

4.6 Climate Change

- 4.6.1 The climate change allowances are based on the Table 2 Peak Rainfall Intensity Allowance in Small and Urban Catchments (use 1961 to 1990 baseline), produced by the Environment Agency (EA).
- 4.6.2 For the Project, it is considered at the upper end and the design life of the buildings is 40 years. From the table, the potential change in the peak rainfall intensity allowance anticipated is 20% however, after consultation with the LLFA , 40% has been used for the calculations.

Table 4-2-Peak rainfall intensity allowance in small and urban catchments (based on a 1961 to 1990 baseline).

| Applies across all of England | Total potential change anticipated for 2015 to 2039 | Total potential change anticipated for 2040 to 2069 | Total potential change anticipated for 2070 to 2115 |
|-------------------------------------|---|---|---|
| Upper End | +10% | +20% | +40% |
| Central | +5% | +10% | +20% |

4.7 Pollution Control

- 4.7.1 The appropriateness of proposed SuDS for the Application Land has been evaluated based on the CIRIA Report C753 Simple Index Approach. This is based on a simple index system, in which SuDS components and types of sites are assigned an index value for pollutant mitigation/hazard levels. To deliver adequate treatment, the SuDS component should have a total pollution mitigation index equal to or larger than the pollution hazard index. The following table summarises the mitigation indices of the proposed SuDS.
- 4.7.2 Due to the multiple levels of treatment the proposed the SuDS are deemed sufficient for treating the various land use types.

| Mitigation indices | | | | | | |
|--------------------------------------|-----|-----|-----|--|--|--|
| Type of SuDS TSS Metals Hydrocarbons | | | | | | |
| Swale | 0.5 | 0.6 | 0.6 | | | |
| Detention basin | 0.5 | 0.5 | 0.6 | | | |
| Filter Strips | 0.4 | 0.4 | 0.5 | | | |

Table 4-3 Mitigation indices of proposed SuDS components.

4.7.3 These values are then compared to the pollution hazard levels of each type of area within the Application Land to evaluate the adequacy of proposed SuDS.

| Table 4-4 Pollution hazard | l indices of | f areas within | the Application | n Land. |
|----------------------------|--------------|----------------|-----------------|---------|
|----------------------------|--------------|----------------|-----------------|---------|

| Land use | Pollution hazard level | Total suspended solids | Metals | Hydroc arbons | Proposed mitigation measure | Adequacy |
|---|------------------------------|------------------------------|--------|------------------|-----------------------------------|----------|
| Low traffic roads, residential car parks | Low | 0.5 | 0.4 | 0.4 | Swales and basins | √ |

| Land use | Pollution hazard level | Total suspended solids | Metals | Hydroc arbons | Proposed mitigation measure | Adequacy |
|----------------------------------|------------------------------|------------------------------|--------|------------------|--|----------|
| Main access road | Medium | 0.7 | 0.6 | 0.7 | Swales, filter trenches and basins | √ |
| Sites with Heavy Pollution | High | 0.8 | 0.8 | 0.8 | Swales, filter trenches and basins | V |

4.8 Proposed Strategy

- 4.8.1 As noted, the Application Land is divided into 10 catchments, shown in Figure 4-3. These were divided due to the large area and several existing ditches crossing the Application Land. There are 10 detention basins and 1 storage tank used to promote biodiversity, treat water quality and attenuate stormwater before being discharged into the existing ditches. Where possible, swales will be used to convey runoff instead of pipes and basins will be used for storage instead of tanks. An orifice is used to control discharge rates from the basins. The proposed SuDS features included in the design are shown on the plan indicated in Figure 4-4 and Appendix F.
- 4.8.2 A hydraulic model has been created in MicroDrainage to design these systems to store the 1 in 100-year (plus 40% climate change) storm event prior to discharge into the existing ditches. Results are shown in Appendix I.
- 4.8.3 As part of the Project, the disused railway line between Flixborough Port and Drangonby Sidings will be reinstated. The LLFA confirmed during a meeting held in May 2021 that the no further restriction for the reinstated railway catchment will be required and it will maintain the existing strategy repairing or replacing the drainage that is not in acceptable condition.
- 4.8.4 The total area, effective impermeable area, and allowed discharge for each catchment is summarised in Table 4-5, which were calculated using the Percentage Impermeable proportions assumptions shown in Table 4-6.
- 4.8.5 The SuDS storage designs and attenuation volumes required are presented in Table 4-7. Areas that contribute runoff into each system is also identified. A short description of the drainage strategy for each catchment is included below, and the calculations and detail follow in the subsequent sections.

| Catchment | Total Area (ha) | Impermeable Area (ha) | Allowed Discharge (l/s) |
|-----------|-----------------|--------------------------|----------------------------|
| 1 | 1.7 | 1.0 | 2.4 |
| 2 | 0.9 | 0.7 | 1.2 |
| 3 | 0.9 | 0.6 | 1.3 |
| 4 | 0.9 | 0.4 | 1.3 |
| 5 | 0.7 | 0.5 | 1.0 |
| 6 | 1.8 | 0.9 | 2.6 |
| 7 | 16.7 | 11.1 | 23.4 |
| 8 | 3.3 | 2.1 | 4.6 |
| 9 | 1.0 | 0.5 | 1.4 |
| 10 | 2.6 | 1.4 | 3.6 |

Table 4-5: Areas and allowed discharge for each catchment.

Table 4-6: Percentage Impermeable proportion assumptions.

| Area | Percentage Impermeable Proportion (%) | | | | |
|-----------------|---------------------------------------|--|--|--|--|
| Roof | 90 | | | | |
| Road | 75 | | | | |
| Grass | 30 | | | | |
| Detention Basin | 100 | | | | |

| Catchment | Туре | Base Area (m²) | Top Area (m ²) | Depth (m) | Total Storage (m ³) | Areas Drained |
|-----------|----------------------|----------------------|----------------------------------|--------------|---------------------------------------|--|
| 1 | Detention Basin 1 | 550 | 925 | 1.3 | 950 | Southern hydrogen and natural gas above ground installations (AGI) |
| 2 | Storage Tank 1 | 756 | 756 | 0.914 | 670 | Western hydrogen production and storage facility and electric vehicle (EV) and hydrogen (H2) refuelling station |
| 3 | Detention Basin 2 | 300 | 640 | 1.5 | 685 | Eastern hydrogen production and storage facility and electric vehicle (EV) and hydrogen (H2) refuelling station |
| 4 | Detention Basin 3 | 405 | 600 | 0.8 | 400 | Southern Access Road |
| 5 | Detention Basin 4 | 165 | 435 | 1.5 | 435 | Railway |
| 6 | Detention Basin 5 | 265 | 585 | 1.3 | 535 | Central Access Road |
| 7 | Detention Basin 6 | 6400 | 7460 | 0.95 | 6500 | North-western ERF and northern concrete block manufacturing facility & plastic recycling facility |
| 7 | Detention Basin 7 | 1490 | 2215 | 1.5 | 2745 | North-western ERF and northern concrete block manufacturing facility & plastic recycling facility |
| 8 | Detention Basin 8 | 1045 | 1625 | 1.5 | 1985 | Southern concrete block manufacturing |

Table 4-7: Summary of SuDS storage designs.

| Catchment | Туре | Base Area (m²) | Top Area (m ²) | Depth (m) | Total Storage (m ³) | Areas Drained |
|-----------|----------------------|----------------------|----------------------------------|--------------|---------------------------------------|--|
| | | | | | | facility & plastic recycling facility |
| 9 | Detention Basin 9 | 520 | 730 | 0.8 | 500 | Northern Access Road |
| 10 | Storage Tank 2 | 2335 | 2335 | 0.61 | 1350 | Northern hydrogen and natural gas above ground installations |







Figure 4-3: Catchment Plan.



Figure 4-4: Proposed SuDS Features.

Catchment 1

4.8.6 Catchment 1 will discharge runoff from the southern hydrogen and natural gas above ground installations and access road to existing ditch 1 in the south-western area at a discharge rate of 2.4 l/s. Stormwater will be conveyed using swales. Attenuation will be provided in detention basin 1 located adjacent to Ferry Road West. The storage will comprise of a 1.3 m deep basin providing the attenuation volume of 950 m³.

Catchment 2

4.8.7 Catchment 2 will discharge runoff from the western hydrogen production and storage facility and electric vehicle (EV) and hydrogen (H2) refuelling station to existing ditch 2 in the southern area at a discharge rate of 1.2 l/s. Stormwater will be conveyed using pipes. Attenuation will be provided in storage tank 1 located under the carpark due to the space constraint in this area. The storage will comprise of a 0.914 m deep ACO StormBrixx SD tank providing the attenuation volume of 670 m³.

Catchment 3

4.8.8 Catchment 3 will discharge runoff from the eastern hydrogen production and storage facility and electric vehicle (EV) and hydrogen (H2) refuelling station to existing ditch 3 in the southern area at a discharge rate of 1.3 l/s. Stormwater will be conveyed using swales. Attenuation will be provided in detention basin 2. The storage will comprise of a 1.5 m deep basin providing the attenuation volume of 685 m³.

Catchment 4

4.8.9 Catchment 4 will discharge runoff from the proposed central access road to existing ditch 5 in the central area at a discharge rate of 1.3 l/s. Stormwater will be conveyed using swales adjacent to the roads. Attenuation will be provided in detention basin 3. The storage will comprise of a 0.8 m deep basin providing the attenuation volume of 400 m³. The outfall into the ditch will be above the existing sheet pile wall seen in Figure 3-3e.

Catchment 5

4.8.10 Catchment 5 will discharge runoff from the railway to existing ditch 4 in the western area at a discharge rate of 1.0 l/s. Stormwater will be conveyed using swales. Attenuation will be provided in detention basin 4. The storage will comprise of a 1.5 m deep basin providing the attenuation volume of 435 m³.
Catchment 6

4.8.11 Catchment 6 will discharge runoff from the proposed central access road to existing ditch 5 in the central area at a discharge rate of 2.6 l/s. Stormwater will be conveyed using swales adjacent to the roads. Attenuation will be provided in detention basin 5. The storage will comprise of a 1.3 m deep basin providing the attenuation volume of 535 m³.

Catchment 7

4.8.12 Catchment 7 will discharge runoff from the North-western ERF and northern concrete block manufacturing facility (CBMF) & plastic recycling facility (PRF) to existing ditch 6 in the central area at a discharge rate of 23.4 l/s. Stormwater will be conveyed using swales where possible. However, the western and eastern side of the northern CBMF and PRF will require some piped systems due to the space constraint. Attenuation will be provided in detention basin 6 and 7. The storage will comprise of a 0.95 and 1.5 m deep basin providing the attenuation volume of 6,500 m³ and 2,745 m³, respectively.

Catchment 8

4.8.13 Catchment 8 will discharge runoff from the southern CBMF and PRF to existing ditch 7 in the central area at a discharge rate of 4.6 l/s. Stormwater will be conveyed using swales. Attenuation will be provided in detention basin 8. The storage will comprise of a 1.5 m deep basin providing the attenuation volume of 1,985 m³.

Catchment 9

4.8.14 Catchment 9 will discharge runoff from the proposed northern access road to existing ditch 9 at a discharge rate of 1.4 l/s. Stormwater will be conveyed using swales adjacent to the roads. Attenuation will be provided in detention basin 9. The storage will comprise of a 0.8 m deep basin providing the attenuation volume of 500 m³.

Catchment 10

4.8.15 Catchment 10 will discharge runoff from the hydrogen and natural gas above ground installations and substations to existing ditch 10 in western side of the road at a discharge rate of 3.6 l/s. Stormwater will be conveyed using pipes adjacent to the buildings. Attenuation will be provided in storage tank 2. The storage will comprise of a 0.61m deep ACO StormBrixx HD tank providing the attenuation volume of 1350 m³. It should be noted that, due to the constraints of the site and the levels, a pump solution may be required for this area, subject to detailed design.

4.9 **Diverted Ditch**

- 4.9.1 Existing Ditch 6 will be diverted due to the location of the proposed access road. The proposed diversion route is shown in Figure 4-6.
- 4.9.2 Calculations for the networks can be found in Appendix I.



Figure 4-5: Image of ditch to be diverted.



Figure 4-6: Proposed ditch diversion route.

4.10 Designing for Exceedance

4.10.1 The Energy Park buildings will be constructed on platforms raised above the existing levels, to raise the buildings out of the River Trent flood areas. Overland flow paths around these platforms will be maintained such that any exceedance events will follow the existing flow paths to the existing points of discharge. The exceedance flow routes are shown in Figure 4-7, where runoff will be diverted to the existing ditches.

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Figure 4-7: Exceedance Flow Routes.

4.11 Easements

4.11.1 SGWMB stated that there is a 9m easement from top of the bank for the existing ditches that can be reduced to 6m after applying for a consent.

4.12 Maintenance

- 4.12.1 Regular maintenance of the sustainable drainage system is essential to maintain its performance and avoid failure of the mechanical/electrical components.
- 4.12.2 Discussions with Severn Trent are ongoing to confirm the adoptability of the various SuDS features.
- 4.12.3 An agreed maintenance programme will be prepared in accordance with CIRIA guidance and supervised by the adopting authority. This will be included within the Building Manual for the development on completion. An outline maintenance plan is shown in Appendix G.
- 4.12.4 Table 4-8 shows the proposed responsible party for the maintenance of the SuDS features for the different catchments:

| Catchment | Maintenance and ownership | Catchment Type |
|-----------|-------------------------------------|------------------|
| 1 | North Lincolnshire Council (Public) | Public Highway |
| 2 | Landowner (Private) | Development Land |
| 3 | Landowner (Private) | Development Land |
| 4 | North Lincolnshire Council (Public) | Public Highway |
| 5 | Landowner (Private) | Development Land |
| 6 | North Lincolnshire Council (Public) | Public Highway |
| 7 | Landowner (Private) | Development Land |
| 8 | Landowner (Private) | Development Land |
| 9 | North Lincolnshire Council (Public) | Public Highway |
| 10 | Landowner (Private) | Development Land |

Table 4-8 Maintenance and ownership

5 Proposed Foul Water Drainage Strategy

5.1 General

5.1.1 The foul water strategy has been developed in accordance with the Severn Trent requirements and Building regulations. The proposed layout can be found in Appendix H.

5.2 Severn Trent Consultation

- 5.2.1 A Pre-development enquiry was submitted to Severn Trent in February 2021.
- 5.2.2 Severn Trent suggested that a sewer modelling was required to check the available capacity in the existing network and connection locations. A summary of the results was received in January 2022 where it was highlight that the existing network will need to be upgraded to take the proposed flows.
- 5.2.3 A meeting to clarify the results from the sewer modelling was held in February 2022 where Severn Trent highlighted that the existing modelling shows that the water is already spilling at the Hollyrood Drive pumping station. It was also mentioned that the flows for the Project modelled by Severn Trent were excessive in comparison to the anticipated flows calculated for the Project.
- 5.2.4 In response to the STWL modelling assessment, various options have been reviewed to mitigate the potential issues relating to reinforcement works to the existing network. Preference is to treat and re-use the effluent in other facilities around the development. We are looking to provide further information to Severn Trent in order to re-run the model using more accurate flows.
- 5.2.5 Also, we are waiting for confirmation of Severn Trent regarding the flow that was removed from the existing buildings that will be demolished. Refer to Appendix A for asset records and Appendix E for correspondence.

5.3 Proposed Strategy

5.3.1 The strategy for the foul water drainage design has been developed so that the Project has been split in three different networks which will have different points of connection to the public sewer (to be confirmed by Severn Trent).

- 5.3.2 Network 1 has been designed to take any foul water from the northern hydrogen and natural gas above ground installations (AGI) and the facilities located to the electric vehicle (EV) and hydrogen (H2) refuelling station, plastic recycling facility (PRF), visitor's centre and the concrete block manufacturing facility (CBMF), and discharge to the existing public sewer located in Bellwin Drive. Due to topography and proposed levels, a gravity connection to the existing public sewer cannot be achieved and a pumping solution will be required. The strategy will be to collect foul water from the gas AGI and the facilities located on the electric vehicle (EV) and hydrogen (H2) refuelling station and discharge by a gravity system to a pumping station located in that area which will pump to another pumping station located to the north of the PRF with an approximate flow of 0.2I/s. The second pumping station will receive flows from the southern pumping station and from the PRF, the CBMF and the visitor centre by gravity and will pump the total flow to the public manhole 3301 located on Bellwin Drive at an estimated flow of circa 2I/s.
- 5.3.3 Network 2 has been designed to take any foul water from Energy Recovery Facility and adjacent facilities and discharge to the existing public sewer located on Bellwin Drive at an estimated flow of circa 3l/s.
- 5.3.4 Network 3 has been designed to take any foul water from the hydrogen and natural gas above ground installations (AGI) located to the north eastern part of the Project. Buildings will be drained by gravity to a pumping station that will pump the flow to the existing public sewer located on First Avenue at an estimated flow of circa 0.5l/s.
- 5.3.5 The pumping stations will be designed to adoptable standards. At this stage it is anticipated that emergency storage will be required and will be designed in accordance with Sewers for Adoption. Proprietary tank systems are proposed to provide this storage.

Appendix A Severn Trent Asset Records







| | 00 7244 7000 7044 7000 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 | Tank 4404 04402 Tank 5005 0400 333300 4305 0400 0 4305 000 0 4305 00 |
|--|--|--|
| NatifailOsajuisa/Dan + + + Hiptay Dan NatifailOsajuisa/Dan - Pális Catelor danjuan/Dan + + + Outer Fige - - NatifailOsajuisa/Dan - Pális Catelor danjuan/Dan - + + Deparitipe + Ratedas Fige - - Pális Catelor danjuan/Dan - + + Deparitipe + Ratedas Fige - | | SEVERN TRENT |

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| Public Foul Gravity/Lateral Drain | | Highway Drain | → | Manhole |
|--|---------------------|------------------------|----------|-----------|
| Public Combined Gravity/Lateral Drain | →→→ | Overflow Pipe | | Manhole |
| Public Surface Water Gravity/Lateral Drain | - >> - | Disposal Pipe | | Abandon |
| Pressure Foul | <u> </u> | Culverted Water Course | | Section 1 |
| Pressure Combined | <u> </u> | Pumping Station | | Private s |
| Pressure Surface Water | <u> </u> | Fitting | • | |









·····

Appendix B Proposed Masterplan



Appendix C Correspondence with LLFA

Francisco Rodriguez

| From: | Billy Green |
|----------|---|
| Sent: | 19 March 2021 12:28 |
| То: | Francisco Rodriguez |
| Cc: | 046658 North Lincs Green Energy Park; Colin Byrne; Nathan George; |
| | LLFAdrainageteam |
| Subject: | RE: North Lincs Green Energy Park- DN15 8UE. LLFA advice |

External Email. This email originated from outside Buro Happold.

Hi Francis

Not that I know of...

We just require a fully compliant FRA and Drainage Strategy...

Kind Regards

Billy Green on behalf of the LLFA Drainage Team Flood Risk Team Asset & Infrastructure Services North Lincolnshire Council

| From: Francisco Rodriguez | |
|---|------------------|
| Sent: 19 March 2021 10:35 | |
| To: Billy Green <b< td=""><td></td></b<> | |
| Cc: 046658 North Lincs Green Energy Park | ; Colin Byrne |
| Nathan George < | LLFAdrainageteam |
| <llfadrainageteam@northlincs.gov.uk></llfadrainageteam@northlincs.gov.uk> | |
| Subject: RE: North Lincs Green Energy Park- DN15 8UE. LLFA advice | |

Good Morning Billy,

Thank you very much for your prompt response.

Could you please confirm if we need any specific documents that we have to complete for the DCO planning application?

Kind Regards Franciss **Francisco Rodriguez (Francis)** Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds

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| From: Billy Green | |
|---|---------------------|
| Sent: 19 March 2021 09:56 | |
| To: Francisco Rodriguez | |
| Cc: 046658 North Lincs Green Energy Park | ; Colin Byrne |
| >; Nathan George | >; LLFAdrainageteam |
| < <u>LLFAdrainageteam@northlincs.gov.uk</u> > | |
| Subject: RE: North Lincs Green Energy Park- DN15 8UE. LLFA advice | |

External Email. This email originated from outside Buro Happold.

Good morning Francisco

Your proposed surface water drainage strategy concept is acceptable in principle. The detail will obviously be confirmed at a later date.

There is not a lot more I can say at this stage.

Kind Regards

Billy Green on behalf of the LLFA Drainage Team Flood Risk Team Asset & Infrastructure Services North Lincolnshire Council

| From: Francisco Rodriguez | |
|---|----------------|
| Sent: 18 March 2021 09:08 | _ |
| To: Billy Green | |
| Cc: 046658 North Lincs Green Energy Park | >; Colin Byrne |
| >; Nathan George | > |
| Subject: RE: North Lincs Green Energy Park- DN15 8UE. LLFA advice | |
| | |
| | |

Good Morning Billy,

Hope you are well,

Could you please assist with the below email?

Please let me know if you require further information

Kind Regards Francis

Francisco Rodriguez (Francis)

Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds

BURO HAPPOLD

From: Francisco Rodriguez Sent: 18 February 2021 14:56 To: <u>LLFAdrainageteam@northlincs.gov.uk</u> Cc: 046658 North Lincs Green Energy Park

>; Colin Byrne

Subject: North Lincs Green Energy Park- DN15 8UE. LLFA advice

; Nathan George

Good Afternoon,

Hope you are keeping well,

We are working on a new development in Flixborough to the south of the Flixborough Industrial Estate, DN15 8UE. The scheme is called The North Lincs Green Energy Park and it is composed of various buildings which includes a new facility where energy will be recovered/produced from burning the waste left overs. Also, there is a concrete plant next to it which will use the ash produce by the Energy Park and also a polymer plant where the plastic from the waste will be melted and recycled. There will be a gas station to the north and an electrical charge point car park to the south. In addition, some vertical farming and glasshouses buildings are also part of the scheme.

The Waste left overs will be brough to the Energy Park via a new access road, a refurbished railway that will include a new stop and from the river using the existing port.

It should be noted that part of the project will go through the DCO (development consent order) scheme due to it meets national needs : reduce amount of waste and generate low carbon energy.

With regards to flooding and based on the Flood map for planning website ,the site is in Flood Zone 3 however, it is within the areas benefiting from flood defences.



Our Water team is working on the impact of introducing this new facility in the current site. It is envisaged that the new buildings and the access road will be protected from flooding raising up the levels in that area whereas the rest of the site will be for flood compensation and biodiversity benefits.

With regards to the surface water strategy, a meeting with the Scunthorpe & Gainsborough Water Management Board (SGWMB) was held 21/10/2020 where it was discussed how the existing drainage surface water strategy works and what restrictions/constraints are presented for the new scheme. SGWMB highlighted that the proposed discharge rate has to match the existing greenfield runoff which it has been assumed as 1.41/s/ha as they stated.

Our proposed strategy will be to collect the surface water for the new impermeable areas and convey the water via swales to an attenuation pond where the water will be restricted and discharge to an existing ditch at the agreed discharge rate. The aim of the proposed surface water strategy is to use as much SuDS as possible which will be designed in accordance with Ciria C753 and the SuDS manual.

It is envisaged to submit information for DCO by September and we would like to know if the LLFA have any requirement that needs to be incorporated in our drainage strategy such as flow restriction or any specific documents that we have to complete for the planning application.

Please don't hesitate to contact me if further information is required,

Kind Regards

Francis

Francisco Rodriguez (Francis) Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds



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Items discussed:

- All parties introduce themselves
- FR gave a brief project description of the project and the proposed surface water strategy including discharge rate criteria and proposed sustainable drainage features considered.
- PJ agreed with the discharge rate criteria which is the same than the pumping station located in Lysaght's drain.
- PJ explained that the SGWMB is working with the Council to produce a flood model of the area to include hypothetic situation of a failure in the pumping station.
- PJ explained that any alteration within the 9m from top of the bank of any watercourse in the area (either they oversee them or not) have to go through a Consent Application that can be done post planning.
- BG stated that any highway drainage (swales and detention basin) or any structure that goes under it, have to be adopted by Highways and therefore design in accordance to meet their criteria.
- PJ and BG stated that there are no records of historic flooding on the proposed development.
- PJ stated that a capacity check of the existing drains is required to make sure the proposed flows can be accommodated in the existing drains.
- SGWMB don't adopt any drainage.
- BG confirmed that a 40% climate change is suitable for this area as the development is in a floodable area.
- PJ confirmed that there is no specific detail for the proposed connections to the existing drains.
- CB mentioned that the existing railway will be reinstated and BG confirmed that the railway drainage to be repaired or replaced if require but will not require further restriction on the discharge rate.
- The northern pumping station pumps water to River Trent, where it follows the route of the railway in the northern area of the site.
- PJ said that proposed bridges on the highways will require a consent order. A vehicle must be able to fit underneath bridge or there must be access to either side of the ditch.
- PJ mentioned that the existing ditches have a 1m freeboard but can fill up during extreme events.

• The ditch connection level should be as close as possible to existing ground level/ the top of bank to avoid a submerge connection during extreme events.

Summary of actions:

BH to include the above information on the surface water drainage strategy.

Changes to the DCO:

Appendix D Correspondence with SGWMB

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Minutes

| Subject | NLGEP -MEETING WITH SCUNTHORPE & GAINSBOROUGH WATER MANAGEMENT BOARD | Job no | 046658 |
|--------------|---|-----------|---|
| Place | TEAM CALL | Date | 21 October 2020 |
| Present | Craig Benson (CB)- SGWMB Benjamin Jackson (BJ)- SGWMB Paul Thomson(PT)-BH Francisco Rodriguez(FR)-BH | Apologies | Paul Jones (PJ)-SGWMB Colin Byrne (CBy)-BH |
| Distribution | As above | | |

Objective of meeting: Introductory meeting for the North Lincolnshire Green Energy Park project regarding existing surface water drainage

| ltem | | Action |
|------------|---|--------|
| 1.0 Introd | duciton | |
| 1.1 | FR gave a brief project description covering the following pointsProject site located in Flixborough. | |
| | • Proposals include a main site for a new energy park and some glasshouses with vertical farming. | |
| | • The different access to the energy park (new road, refurbished railway and new port). | |
| | • The intention is to submit the main energy park through a DCO application in approximately one years' time and the other plots a few months later as part of two separate local planning applications. | |
| 2.0 Existi | ing Drainage | |
| 2.1 | CB explained that the existing land is drained by a series of main watercourses and small water bodies that discharge to the river Trent. There are 2 pumping stations and outfalls. One to the north of the Industrial Estate and one to the north of Neap House and south of the proposed site. See images for clarity. | |

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| 2.8 CB stated that there is a 9m easement from the top of the watercourse bank (it could be reduced to 6m). 2.9 CB stated that there are no issues building over the watercourses and they can be culverted or diverted if necessary, but this has to be consulted via the consent process. 2.10 CB stated that not all the consents may have a fee associated. This will need to be discussed with PJ when we have more details. 2.11 CB stated that anything within the region (small watercourses, ditches, etc) requires approval from the Board. 2.12 CB mentioned the watercourses are maintained annually about this | 2.7 | CB confirmed the timescale for a response is 2months for any consent/application. | |
|---|------|---|--|
| 2.9 CB stated that there are no issues building over the watercourses and they can be culverted or diverted if necessary, but this has to be consulted via the consent process. 2.10 CB stated that not all the consents may have a fee associated. This will need to be discussed with PJ when we have more details. 2.11 CB stated that anything within the region (small watercourses, ditches, etc) requires approval from the Board. 2.12 CB mentioned the watercourses are maintained annually about this the region (small watercourses). | 2.8 | CB stated that there is a 9m easement from the top of the watercourse bank (it could be reduced to 6m). | |
| 2.10 CB stated that not all the consents may have a fee associated. This will need to be discussed with PJ when we have more details. 2.11 CB stated that anything within the region (small watercourses, ditches,etc) requires approval from the Board. 2.12 CB mentioned the watercourses are maintained annually about this time. | 2.9 | CB stated that there are no issues building over the watercourses and they can be culverted or diverted if necessary, but this has to be consulted via the consent process. | |
| 2.11 CB stated that anything within the region (small watercourses, ditches,etc) requires approval from the Board.2.12 CB mentioned the watercourses are maintained annually about this time. | 2.10 | CB stated that not all the consents may have a fee associated. This will need to be discussed with PJ when we have more details. | |
| 2.12 CB mentioned the watercourses are maintained annually about this | 2.11 | CB stated that anything within the region (small watercourses, ditches,etc) requires approval from the Board. | |
| time. | 2.12 | CB mentioned the watercourses are maintained annually about this time. | |

The minutes detailed herein reflect the author's recollection of the discussions held during the meeting detailed above. If you feel that these minutes are inaccurate; proposed additions, corrections and/or comments must be submitted to the author in writing within five working days of the date of these minutes. If no written responses are received within this period, these minutes will be deemed the official record of the meeting.

Appendix E Correspondence with Severn Trent

Francisco Rodriguez

| From: Sent: To: Subject: | Net Dev East <net.dev.east@severntrent.co.uk> 10 May 2021 15:49 Francisco Rodriguez RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592</net.dev.east@severntrent.co.uk> |
|-----------------------------------|---|
| Follow Up Flag: | Follow up |
| Flag Status: | Completed |

External Email. This email originated from outside Buro Happold.

ST Classification: OFFICIAL PERSONAL

Hi Francisco

Thank you for your email below and apologies for the delay in response, I have been off work for a few weeks.

We will require sewer modelling as the flows are pumped and there are two sewage pumping stations that will be affected so we will need to know if they have the capacity for the extra flows.

Please also be aware that as there will be trade effluent you will need to contact our business services team.

Would you like me to progress with requesting a quote for sewer modelling? The process can take a minimum of 2 months.

Kind regards

Asif Mussa

Senior Evaluation Technician Asset Protection (Wholesale Operations) East



| From: Francisco Rodriguez | > |
|--|------------------------|
| Sent: 30 April 2021 13:51 | |
| To: Net Dev East < <u>Net.Dev.East@severntrent.co.uk</u> > | |
| Cc: 046658 North Lincs Green Energy Park | >; Colin Byrne |
| | |
| Subject: RE: Developer Enquiry Response: Stather Road, Flixbor | rough Our Ref: 8462592 |

Hi Asif,

Could you please provide us with an update of my previous email?

Thanks

Francis **Francisco Rodriguez (Francis)** Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds

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From: Francisco Rodriguez
Sent: 06 April 2021 16:38
To: Net Dev East <<u>Net.Dev.East@severntrent.co.uk</u>>
Cc: 046658 North Lincs Green Energy Park

; Colin Byrne

Subject: RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

Hi Asif,

We have estimated that approximately 2I/s has been removed from the network that is located in Bellwin Drive/First Avenue as part of the buildings that will be demolished and we are adding 5.5 l/s to the network for the new buildings, which means that we are adding 3.5 l/s extra to the existing network in Bellwin Drive/First Avenue as specified in the attached sketch.

Is it required a modelling exercise to assess if the additional 3.5l/s can be accommodated within the existing network or could we have an answer without it?

Also, can you please let us know a contact number or email address to contact you directly? It has been two months since we applied for the pre development enquiry and we would like to speed things up. It is a bit frustrating we have to wait two weeks to receive an answer for something that can be sorted with a 5min conversation.

Kind Regards

Francisco Rodriguez (Francis) Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds

BURO HAPPOLD

| From: Net Dev East < <u>Net.Dev.East@severntrent.co.uk</u> > | | | |
|--|---|----------------|--|
| Sent: 06 April 2021 15:34 | | | |
| To: Francisco Rodriguez | > | | |
| Cc: 046658 North Lincs Green Energy Park | | >; Colin Byrne | |

Subject: RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

External Email. This email originated from outside Buro Happold.

ST Classification: OFFICIAL PERSONAL

Hi Francis

Thank you for your email below.

Sewer modelling will be required and as it is a commercial development, we would not fund the exercise.

Would you like me to request a quote for sewer modelling?

Kind regards

Asif Mussa

Senior Evaluation Technician Asset Protection (Wholesale Operations) East

WONDERFUL ON TAP



| From: Francisco Rodriguez | |
|--|---------------|
| Sent: 19 March 2021 13:21 | |
| To: Net Dev East < <u>Net.Dev.East@severntrent.co.uk</u> > | |
| Cc: 046658 North Lincs Green Energy Park | ; Colin Byrne |

Subject: RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

Hi Asif,

Thanks for the email.

I have attached a sketch with the buildings and flows that are expecting to be pumped or discharged by gravity.

Due to levels, we envisage that only the Green Energy Park (green building) will discharged by gravity to the public sewer located in Bellwin drive/First Avenue.

Please let me know if you require further information.

Kind Regards Francis

Francisco Rodriguez (Francis)

Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds
BURO HAPPOLD

From: Net Dev East <<u>Net.Dev.East@severntrent.co.uk</u>>

Sent: 19 March 2021 11:07

To: Francisco Rodriguez

Cc: 046658 North Lincs Green Energy Park

Subject: RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

External Email. This email originated from outside Buro Happold.

ST Classification: OFFICIAL PERSONAL

Hi Francis

Thank you for your email below.

Are the flows going to be pumped or discharged by gravity?

Kind regards

Asif Mussa

Senior Evaluation Technician Asset Protection (Wholesale Operations) East





From: Francisco Rodriguez Sent: 08 March 2021 10:06 To: Net Dev East <<u>Net.Dev.East@severntrent.co.uk</u>> Cc: 046658 North Lincs Green Energy Park Subject: RE: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

Hi,

Thanks for your email,

We have calculated an estimated flow rate for each of the buildings as it is intended to re-use the 51.5l/s incoming flow on other processed of the facility to reduce the water that leaves the facilities.

Please see attached sketch. Could you please confirm if:

• An estimated flow of 4l/s could be accommodated within the existing 225mm foul water pipe that is located in Bellwin Drive?

- An estimated flow of 0.5l/s could be accommodated within the existing foul water network located in Ferry Road West?
- An estimated flow of 0.5l/s could be accommodated within the existing foul water network located in First Avenue?
- We can connect surface water from the Electrolyser building and Gas AGI (yellow buildings) to the existing surface water sewer located within First Avenue at a restricted discharge rate in case infiltration is not suitable on site?

Please let me know if you require further information

Kind Regards

Franciss **Francisco Rodriguez (Francis)** Infrastructure Engineer Buro Happold | Cities Infrastructure Leeds

BURO HAPPOLD

From: Net Dev East <<u>Net.Dev.East@severntrent.co.uk</u>>
Sent: 24 February 2021 15:02
To: Francisco Rodriguez
Subject: Developer Enquiry Response: Stather Road, Flixborough Our Ref: 8462592

External Email. This email originated from outside Buro Happold.

ST Classification: UNMARKED

Dear Francisco

Please find attached below our Developer Enquiry response letter, along with a sewer record extract and supplementary guidance notes with regard to the above site.

If you have any further queries with regard to our response, please do not hesitate to contact us on the number / email address mentioned below. Please refrain from sending responses to a certain individual directly. Our email address below will ensure that your response is logged and tracked for a response. When responding, please quote our reference number above in all return correspondence.

Regards,

Asset Protection Waste Water

(reply to <u>net.dev.east@severntrent.co.uk</u>)





Did you know? You can now make full applications online for a variety of our Developer Service offerings including Development Enquiries. Take a look here for more details

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SEVERN TRENT WATER LIMITED

SCA Sewer Modelling Report - Summary of results

Date: 19/01/22

SCA Ref: SCA-0749

Dev Enq Ref: 8462592

Site Address: Land at Energy Green Park, Stather Road, Flixborough

Sewer modelling of the above confirms the following impacts on the public sewerage network:

Flooding Impact – High

Pollution Impact – Very High

Operational Impact – Very High

Further Notes:

Capacity upgrades will be required to accommodate the proposed development.

The flooding impact has been triggered as a result of sewer surcharge during dry weather flow as a result of the proposed development flows

The pollution impact has been triggered as a result of operation of increased spills of an Emergency Overflow

The Operational risk is triggered due to exacerbating storage volume requirements of several SPS in the flow route

This has been referred to our upgrades team for the domestic element to add to our promotions list. The works will be carried out depending on the priority of the schemes on the list. We are not obliged to carry out upgrades for trade effluent.

Senior Evaluation Technician: Asif Mussa



- BH gave an overview of the scheme and discharge locations for FW from the development to the proposed STW network.
- STW confirmed that the flows from existing buildings have been removed from the model.
- STWL noted that they have used 3.8l/s where flows are pumped from NLGEP. This is an assumed pump rate based on the minimum requirements for adoption. Since NLGEP has 2no. pumped connections and 1no. gravity connection, the actual flow rate modelled by STWL is 10.6l/s.
- STW would need to re-run the model. Noted that this would be outside of the usual 14day period to request updates/re-runs, so likely to incur additional modelling costs. BH requested STWL to review based on timescales for response and availability to meet to discuss modelling output.
- STW highlighted the areas of the model/network where the issues are being reported:
- Emergency CSO at Hollyrood Drive SPS (this was the most significant impact).
 - Very high pollution impact (overflow into ditch)
 - Storage issue
 - Pumping capacity issue
 - Burn Road CSO (medium impact)
- Moors Road pumping station (medium impact)
 - Pumping capacity issue
- STW noted that the modelling shows that it is currently spilling at the Hollyrood Drive SPS, so any new flows are likely to result in an impact.
- Discussion if an alternative location to connect to the STWL FW network could be found to avoid discharging through the Hollyrood Drive SPS. Noted that this will be difficult.
- Noted that reinforcement/upgrade works is confirmed by a separate (promotions) team in order of priority. STW noted there could be up to 5-year wait to get to project/site based on current upgrade requirements across the network.

• Discussion about the trade effluent. STWL noted that this will need to be confirmed with their promotions team

Summary of actions:

- STWL to confirm the flow rate removed from the modelling.
- BH to review and confirm with Solar 21 if the FW network will remain private upstream of connection to the STW sewer. If so, lower pump rates can be confirmed and included in the STW modelling.

Changes to the DCO:

Appendix F Proposed Stormwater Drainage Layout





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Appendix G SuDS Maintenance Plan

| SUDS COMPONE | INTS MAINTENANCE REQUIREMENTS | |
|------------------|---|---------------------------|
| SUDS | Swale | |
| COMPONENT | | |
| MAINTENANCE | ACTION | FREQUENCY |
| Regular | Litter and debris removal | Monthly |
| maintenance | Amenity grass cutting at 35-50mm | As required |
| | Grass cut to ditch access and overflows 75- | Monthly or as required |
| | 100mm not to exceed 150mm | |
| | Inspect and clear ditch where required, inlets, | Monthly |
| | outlets and overflows | |
| Occasional tasks | Remove leaf accumulation | As required |
| | Cut back overhanging branches to allow | As required |
| | dense vegetation growth | |
| Remedial work | Repair erosion, level uneven surfaces or | As required |
| | damage by re-turfing or seeding | |
| | Repair or replace inlets, outlets or check dams | As required |
| | to design detail | |
| | Remove silt and spread locally, reinstate | As required |
| | surface | |
| SUDS | Detention basins | |
| COMPONENT | | |
| MAINTENANCE | ACTION | FREQUENCY |
| Regular | Remove litter and debris | Monthly |
| maintenance | Cut grass for spillways and access routes | Monthly or as required |
| | Cut grass – meadow grass in and around | Six monthly (spring – |
| | basin | before nesting season, |
| | | and autumn) |
| | Manage other vegetation and remove | Monthly at start then as |
| | nuisance plants | required |
| | Inspect inlets, outlets and overflows for | Monthly |
| | blockages and clear if required | |
| | Inspect banksides, structures, pipework etc. | Monthly |
| | for evidence of physical damage | |
| | Inspect inlets and facility surface for silt | Monthly during first |
| | accumulation, establish appropriate silt | year, then annually or as |
| | removal frequencies | required |
| | | |
| | Check any penstocks or other mechanical | Annually |

The table below is based on the CIRIA C753 SuDs Manual, 2015.

| SUDS COMPONE | NTS MAINTENANCE REQUIREMENTS | |
|-------------------|--|-----------------------------------|
| SUDS | Swale | |
| COMPONENT | | |
| MAINTENANCE | ACTION | FREQUENCY |
| | Tidy all dead growth before start of growing | Annually |
| | season | |
| | Remove sediment from inlets, outlet and | Annually or as required |
| | forebay | |
| | Manage wetland plants in outlet pool where provided | Annually |
| Occasional tasks | Reseed areas of poor vegetation growth | As required |
| | Prune and trim any trees and remove cuttings | Every two years or as required |
| | Remove sediments from inlets, outlet, forebay | Every 5 years or as |
| | and main basin when required | required |
| Remedial work | Repair erosion or other damage by reseeding or re-turfing | As required |
| | Realignment of rip-rap | As required |
| | Repair/rehabilitate inlets, outlets and overflows | As required |
| | Relevel uneven surfaces and reinstate design levels | As required |
| SUDS COMPONENT | Key design standards for adoption inlets, ou | tlets and connections |
| MAINTENANCE | ACTION | FREQUENCY |
| Regular | Litter and debris removal | Monthly |
| maintenance | Grass cut 1m around structure at 50mm | Monthly |
| | where necessary | |
| | Remove silt from forebays, aprons or other | Monthly or as required |
| | structures if present | |
| | Inspect and clear inlets, outlets, control | Monthly or as required |
| | structures and overflows | |
| Occasional tasks | Removal of tree or shrub growth within 5m | As required |

Appendix H Proposed Foul Water Drainage Layout







Planning Act 2008 The Infrastructure Planning (Applications: Prescribed forms and Procedure) Regulations 2009 Regulation: 5(2)(o) NOTES: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS. DRAWINGS BASED ON THE FOLLOWING BACKGROUND INFORMATION: ORDNANCE SURVEY MAPS RECEIVED © CROWN COPYRIGHT AND DATABASE RIGHTS 2021 OS LICENCE 100035409 THE COMPLETENESS OF THE UNDERGROUND SERVICE INFORMATION CANNOT BE GUARANTEED AND THEREFORE OTHER SERVICES MAY EXIST. LEGEND EXISTING EXISTING FOUL WATER (SEVERN TRENT) PROPOSED SITE BOUNDARY PROPOSED FOUL WATER 1 PROPOSED FOUL WATER RISING MAIN PUMPING STATION P0 ISSUED FOR DCO SUBMISSION 25.02.2022 FR CB CB Date Iss'd Rev'd App'd Rev Description DCO SUBMISSION Project Stage INFORMATION Status of Drawing Clien Level 33, Euston Tower, 286 Euston Rad, London, NW1 3DP BURO HAPPOLD forthern planners Coology Creent NORTH LINCOLNSHIRE GREEN ENERGY PARK LTD Client **BURO HAPPOLD** Consultant NORTH LINCOLNSHIRE GREEN ENERGY PARK Project INDICATIVE CONNECTION PLANS Drg Title FOUL WATER DRAINAGE OVERALL SHEET Planning Inspectorate No. EN010116 Scale@A1 1:20000 Drawn/Designed By. J.SLEEMAN Checked By. C.BYRNE Approved By. C.BYRNE 1000 1:20000 Drawing No. Revision P0 NLGEP-BHE-XX-XX-DR-C-3200

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Appendix I MicroDrainage Results

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| S3 | 3.001 | 50.00 | 6.73 | 2.096 | 0.087 | 0. | 0.0 |) | 0.0 | 0.45 | 64.6 | 11.8 | |
| S3 | 3.002 | 50.00 | 7.96 | 1.938 | 0.127 | 0. | υ 0.0 |) | 0.0 | 0.45 | 64.6 | 17.1 | |
| S4 | 1.000 | 50.00 | 6.73 | 2.200 | 0.081 | . 0. | 0 0.0 |) | 0.0 | 0.43 | 61.4 | 11.0 | |
| S4 | 1.001 | 50.00 | 8.46 | 1.976 | 0.114 | 0. | 0 0.0 |) | 0.0 | 0.43 | 61.4 | 15.4 | |
| | | | | | | | | | | | | | |
| S3 | 3.003 | 50.00 | 8.89 | 1.752 | 0.241 | 0. | 0 0.0 |) | 0.0 | 0.90 | 63.8 | 32.6 | |
| C 1 | 003 | 50 00 | 10 20 | 1 675 | | 0 | 0 0 0 |) | 0 0 | 0 50 | 7∩ ∘ | 62 1 | |
| 1 | | 55.00 | 10.20 | 1.075 | 0.430 | , 0. | | , | 0.0 | 0.00 | , 0 . 0 | 02.1 | |
| | | | | | | | | | | | | | |
| | | | | | ©1982- | 2020 Inno | ovyze | | | | | | |

| BuroHappold Ltd | | Page 1 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |
| | | |

STORM SEWER DESIGN by the Modified Rational Method $% \left({{\left({{{\left({{{\left({{{\left({{{\left({{{}}}} \right)}} \right.} \right.} \right)}_{0,0}}}} \right)} \right)} \right)$

Network Design Table for Catchment 2

« - Indicates pipe capacity < flow

| PN | Length | Fall | Slope | I.Area | T.E. | Ba | ase | n | HYD | DIA | Section Type | Auto |
|--------|--------|-------|-------|--------|--------|------|-------|-------|------|------|--------------|--------|
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow | (l/s) | | SECT | (mm) | | Design |
| s1.000 | 25.281 | 0.169 | 150.0 | 0.000 | 5.00 | | 0.0 | 0.035 | 0 | 100 | Pipe/Conduit | ۵ |
| S1.001 | 18.759 | 0.131 | 143.2 | 0.000 | 0.00 | | 0.0 | 0.035 | 0 | 100 | Pipe/Conduit | Ō |
| S1.002 | 38.143 | 0.127 | 300.3 | 0.688 | 0.00 | | 0.0 | 0.035 | 0 | 300 | Pipe/Conduit | Ö |

Network Results Table

| PN | Rain | T.C. | US/IL | Σ I.Area | ΣΕ | Base | Foul | Add Flow | Vel | Cap | Flow |
|--------|---------|--------|-------|----------|------|-------|-------|----------|-------|-------|-------|
| | (mm/hr) | (mins) | (m) | (ha) | Flow | (l/s) | (l/s) | (1/s) | (m/s) | (l/s) | (l/s) |
| s1.000 | 50.00 | 7.11 | 2.100 | 0.000 | | 0.0 | 0.0 | 0.0 | 0.20 | 1.6 | 0.0 |
| S1.001 | 50.00 | 8.64 | 1.931 | 0.000 | | 0.0 | 0.0 | 0.0 | 0.20 | 1.6 | 0.0 |
| S1.002 | 50.00 | 10.81 | 0.912 | 0.688 | | 0.0 | 0.0 | 0.0 | 0.29 | 20.7« | 93.1 |

| BuroHappold Ltd | | | | | | | Page 2 |
|--|---|-----------------------------------|----------------------------|---|--|---|---|
| Camden Mill | | | | | | | |
| Lower Bristol Road | 1 | | | | | | |
| Bath | | | | | | | Mirro |
| Date 21/02/2022 09 | 9:36 | D | esign | ed by St | efan Gano | dler | Drainage |
| File NLGEP Stormwa | ater Model | . C | hecke | d by | | | brainage |
| Innovyze | | N | etwor | k 2020.1 | .3 | | |
| | | | _ | | _ | | |
| | <u>Area S</u> | umma | ry fo | or Catchm | ent 2 | | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total | |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) | |
| 1.000 | | | | | | | |
| 1.000 | | _ | 100 | 0.000 | 0.000 | 0.000 | |
| 1.002 | Classification | Roof | 90 | 0.010 | 0.009 | 0.009 | |
| | Classification | Roof | 90 | 0.010 | 0.009 | 0.018 | |
| | Classification | Roof | 90 | 0.063 | 0.056 | 0.075 | |
| | Classification | Roof | 90 | 0.000 | 0.000 | 0.075 | |
| | Classification | Roof | 90 | 0.001 | 0.001 | 0.076 | |
| | Classification | Roof | 90 | 0.002 | 0.002 | 0.078 | |
| · · · · · · · · · · · · · · · · · · · | Classification | Roof | 90 | 0.036 | 0.032 | 0.111 | |
| | Classification | Roof | 90 | 0.014 | 0.013 | 0.123 | |
| | Classification | Road | 90 75 | 0.001 | 0.001 | 0.124 | |
| | Classification | Roof | , S 90 | 0.009 | 0.008 | 0.688 | |
| | | | | Total | Total | Total | |
| | | | | 0.888 | 0.688 | 0.688 | |
| | | | | | | | |
| | Simulation | n Cr: | iteri | a for Ca | tchment 2 | 2 | |
| Areal F Hot S Manhole Headloss Foul Sewage pe | Reduction Facto Hot Start (mins Start Level (mm s Coeff (Global er hectare (1/s | r 1.0))) 0.5) 0.0 | 000 0 F1 000 | MADD F | actor * 10 Inlet son per Da Ru Output In | m ³ /ha Storad Coeffiecier y (l/per/da n Time (min terval (min | ge 2.000 nt 0.800 y) 0.000 s) 60 s) 1 |
| Number Numb Numbe | of Input Hydro er of Online Co r of Offline Co | ograpi ontro ontro | ns 0 M ls 1 M ls 0 M | Number of S Number of S Number of H | Storage Sti Iime/Area I Real Time (| ructures 1 Diagrams 0 Controls 0 | |
| | Synth | etic | Rair | nfall Det | ails | | |
| | Rainfall № | iode 1 | | | | няч | |
| Ret | curn Period (ve | ars) | | | | 100 | |
| FI | EH Rainfall Ver | sion | | | | 1999 | |
| | Site Loca | tion | GB 48 | 6200 41340 | 0 SE 86200 | 13400 | |
| | С (| 1km) | | | | -0.025 | |
| | D1 (| 1km) | | | | 0.330 | |
| | D2 (| 1km) | | | | 0.312 | |
| | D3 (| ⊥KM) | | | | 0.298 | |
| | 또 (도 / | ⊥KM) 1 km) | | | | 0.300 2 451 | |
| | ت (Summer St | orms | | | | Yes | |
| | Winter St | orms | | | | Yes | |
| | Cv (Sum | mer) | | | | 0.750 | |
| | Cv (Win | ter) | | | | 0.840 | |
| Sto | orm Duration (m | ins) | | | | 30 | |
| | | | | | | | |
| | © | 1982- | -2020 | Innovyze | e | | |

| вигонарроіd Ltd | | | | | Page 3 |
|---|---|--|--|---|---|
| Camden Mill | | | | | |
| Lower Bristol Road | | | | | |
| Bath | | | | | Micco |
| Date 21/02/2022 09:36 | Designed | l by St | efan Gand | ler | |
| File NLGEP Stormwater Model | Checked | by | | | Dialnage |
| Innovyze | Network | 2020.1 | .3 | | |
| | | | | | |
| Online Co | ntrols fo | r Catc | hment 2 | | |
| | | | | | |
| Hydro-Brake® Optimum Manhol | e. \$14 1 | S/PN. | S1 002 V | olume (m | 3)· 2 2 |
| | | | 51.002/ 1 | orane (m | /• 2•2 |
| Unit | Reference | MD-SHE- | -0052-1200- | 0910-1200 | |
| Desig | gn Head (m) Flow (l/s) | | | 0.910 | |
| Design | Flush-Flom | ı | C | alculated | |
| | Objective | Minim | ise upstrea | m storage | |
| | Application | | | Surface | |
| Dia Sump | ameter (mm) | | | ıes 52 | |
| Invert | Level (m) | | | 0.912 | |
| Minimum Outlet Pipe Dia | ameter (mm) | | | 75 | |
| Suggested Manhole Dia | ameter (mm) | | | 1200 | |
| Control Po | oints | Head (m |) Flow (l/s | •) | |
| Design Point (C | alculated) | 0.91 | 0 1. | 2 | |
| | Flush-Flo™ | 0.23 | 0 1. | 1 | |
| Moon Elevery | Kick-Flo® | 0.46 | 8 0. | 9 | |
| Heali FIOW OVEL | nead Kange | | 1. | 0 | |
| The hydrological calculations have b | been based | on the H | Head/Discha | rge relatio | onship for the |
| Hydro-Brake® Optimum as specified | Should and | +how +rr | o of contra | | |
| Hudro-Proko Ontimum ho utilized th | on these st | orago re | pe or contro | ol device d | other than a |
| Hydro-Brake Optimum® be utilised the invalidated | en these st | orage ro | outing calc | ol device o lations wi | other than a 111 be |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo | w (1/s) De | orage ro pth (m) | Flow (1/s) | Depth (m) | other than a 11 be Flow (1/s) |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo | w (1/s) De | orage ro pth (m) | Flow (1/s) | Depth (m) | other than a 111 be Flow (1/s) 3 0 |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 | w (1/s) De 1.4 1.5 | orage ro pth (m) 3.000 3.500 | E of contro puting calco Flow (1/s) 2.1 2.2 | Di device o ilations wi Depth (m) 7.000 7.500 | other than a 111 be Flow (1/s) 3.0 3.1 |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 | <pre>w (l/s) Deg 1.4 1.5 1.5</pre> | orage ro pth (m) 3.000 3.500 4.000 | Flow (1/s) 2.1 2.2 2.4 | Depth (m) 7.000 7.500 8.000 | Ther than a bll be Flow (1/s) 3.0 3.1 3.2 |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 | <pre>involute and en these st w (1/s) Dey 1.4 1.5 1.5 1.6</pre> | <pre>pth (m) 3.000 3.500 4.000 4.500</pre> | Flow (1/s) 2.1 2.2 2.4 2.5 | Depth (m) 7.000 7.500 8.000 8.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1 8</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a 11 be Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum us specified. Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 | <pre>v (1/s) Deg 1.4 1.5 1.5 1.6 1.7 1.8 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 | Flow (l/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>w (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a 11 be Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>ther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9 </pre> | <pre>corage ro pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500</pre> | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>ther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>ther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>w (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9 </pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>ther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a lll be Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>bther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9 </pre> | <pre>corage rc pth (m)</pre> | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | w (1/s) Deg 1.4 1.5 1.5 1.6 1.7 1.8 1.9 1.9 | pth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a 11 be Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9</pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | <pre>bther than a ll1 be Flow (1/s)</pre> |
| Hydro-Brake Optimum® be utilised the invalidated Depth (m) Flow (1/s) Depth (m) Flo 0.100 1.0 1.200 0.200 1.1 1.400 0.300 1.1 1.600 0.400 1.0 1.800 0.500 0.9 2.000 0.600 1.0 2.200 0.800 1.1 2.400 1.000 1.3 2.600 | <pre>v (1/s) Deg 1.4 1.5 1.6 1.7 1.8 1.9 1.9 </pre> | pth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 2.1 2.2 2.4 2.5 2.6 2.7 2.8 2.9 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Ther than a Flow (1/s) 3.0 3.1 3.2 3.3 3.4 3.5 |

| BuroHappold Ltd | | Page 4 | | | | | | |
|--|--|-------------------|--|--|--|--|--|--|
| Camden Mill | | | | | | | | |
| Lower Bristol Road | | | | | | | | |
| Bath | | Micco | | | | | | |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Urainage | | | | | | |
| | Network 2020 1 3 | | | | | | | |
| | NCCWOIR 2020.1.5 | | | | | | | |
| Storage Str | Storage Structures for Catchment 2 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Cellular Storage | Manhole: S14, DS/PN: S1.002 | | | | | | | |
| | | | | | | | | |
| Inver Infiltration Coefficient | rt Level (m) 0.912 Safety Factor 2.0 Base (m/hr) 0.00000 Porosity 0.97 Side (m/hr) 0.00000 |) 7 | | | | | | |
| Denth (m) Area (m ²) Inf Are | Side (m/m) 0.00000 | (m ²) | | | | | | |
| Depen (m) Area (m-) INI. Are | a (m) bepun (m) Area (m ⁻) Int. Area | (| | | | | | |
| 0.000 756.0 | 0.0 0.911 0.0 | 0.0 | | | | | | |
| 0.910 /56.0 | 0.0 | | | | | | | |
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| Camden Mill | | | |
| Lower Bristol Road | | | |
| Bath | | | Micro |
| Date 21/02/2022 09:36 | Designed by S | Stefan Gandler | Drainage |
| File NLGEP Stormwater Model | . Checked by | | brainacje |
| Innovyze | Network 2020 | .1.3 | |
| 1 year Return Period Summary o | of Critical Res | ults by Maximum Lev | el (Rank 1) |
| | for Catchment 2 | | |
| | | | |
| 5 | Simulation Criteri | a | |
| Areal Reduction Factor | 1.000 Addition | al Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) Hot Start Level (mm) | 0 MADD 0 | Factor * 10m³/ha Stora | age 2.000 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per P | erson per Day (1/per/da | ay) 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | | |
| Number of Input Hydrod | graphs () Number of | f Storage Structures 1 | |
| Number of Online Con | ntrols 1 Number of | f Time/Area Diagrams 0 | |
| Number of Offline Con | ntrols 0 Number of | f Real Time Controls 0 | |
| Synt | hetic Rainfall Det | ails | |
| Rainfall Mo | del | FEH | |
| FEH Rainfall Vers | ion | 1999 | |
| Site Locat | ion GB 486200 4134 | 400 SE 86200 13400 | |
| D1 (1 | km) | 0.330 | |
| D2 (1 | km) | 0.312 | |
| D3 (1) | km) | 0.298 | |
| E (1. | km) km) | 0.300 | |
| Cv (Summ | er) | 0.750 | |
| Cv (Winte | er) | 0.840 | |
| Margin for Flood Risk Wa | rning (mm) | 300 | 0 |
| Analysi | s Timestep 2.5 Sec | cond Increment (Extende | d) |
| | DTS Status | 0 | FF |
| Iner | DVD Status | | ON |
| Inci | LIA Status | | 011 |
| | | | |
| Profile(s) Duration(s) (mins) | 15, 30, 60, 120, | Summer and Winte 240, 360, 480, 960, 14 | er 40 |
| Return Period(s) (years) | 10, 00, 00, 110, | 1, 30, 1 | 00 |
| Climate Change (%) | | 0, 40, | 40 |
| | | | |
| | | | Water |
| US/MH Return Clin | mate First (X) | First (Y) First (Z) Ov | verflow Level |
| PN Name Storm Period Cha | nge Surcharge | Flood Overflow | Act. (m) |
| S1.000 S12 15 Summer 1 | +0% | | 2.100 |
| S1.001 S13 15 Summer 1 | +0% | | 1.931 |
| S1.002 S14 1440 Winter 1 | +0% 30/60 Summer | | 1.090 |
| | | | |
| Surcharged Flooded | 1 | Half Drain Pipe | |
| US/MH Depth Volume PN Name (m) (m ³) | Flow / Overflow | Time Flow (mins) (1/s) Status | Level |
| | Cap. (1/3) | (| LACEGUEU |
| S1.000 S12 -0.100 0.000 | 0.00 | 0.0 OK | |
| SI.001 SI3 -0.100 0.000 | 0.00 | 0.0 OF | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 2</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.002 | S14 | -0.122 | 0.000 | 0.05 | | 1307 | 1.1 | OK | |

| Camden Mill Lower Bristol Road Bath Date 21/02/2022 09:36 Designed by Stefan Gandler | |
|---|-----------------------|
| Lower Bristol Road Bath Date 21/02/2022 09:36 Designed by Stefan Gandler | |
| Bath Date 21/02/2022 09:36 Designed by Stefan Gandler | and the second second |
| Date 21/02/2022 09:36 Designed by Stefan Gandler | |
| | |
| File NLGEP Stormwater Model Checked by | laye |
| Innovyze Network 2020.1.3 | |
| | |
| 30 year Return Period Summary of Critical Results by Maximum Level (Ra | nk 1) |
| for Catchment 2 | |
| | |
| Simulation Criteria | |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.00 | 0 |
| Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.00 | 0 |
| Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.00 | 0 |
| Foul Sewage per hectare (1/s) 0.000 | |
| | |
| Number of Input Hydrographs 0 Number of Storage Structures 1 | |
| Number of Offline Controls 0 Number of Real Time Controls 0 | |
| | |
| Synthetic Rainfall Details | |
| FEH Rainfall Version 1999 | |
| Site Location GB 486200 413400 SE 86200 13400 | |
| C (1km) -0.025 | |
| D1 (1km) 0.330 | |
| D2 (1km) 0.312 | |
| D3 (1km) 0.298 | |
| E (1km) 0.300 | |
| F (1km) 2.451 | |
| Cv (Summer) 0.750 | |
| CV (Winter) 0.840 | |
| Margin for Flood Risk Warning (mm) 300.0 | |
| Analysis Timestep 2.5 Second Increment (Extended) | |
| DTS Status OFF | |
| DVD Status ON | |
| Inertia Status ON | |
| | |
| Profile(s) Summer and Winter | |
| $\begin{array}{c} \text{Duracion(s)} (\text{mins}) 15, 50, 60, 120, 240, 560, 460, 960, 1440 \\ \text{Return Period(s)} (\text{vears}) 1 30 100 \\ \end{array}$ | |
| Climate Change $(\frac{8}{2})$ 0. 40, 40 | |
| | |
| WADNING, Half Drain Time has not been calculated as the structure is too full | |
| WARNING: MAIL DIAIN TIME HAS NOT Deen calculated as the structure is too full. | |
| | |
| | Water |
| US/MH Return Climate First (X) First (Y) First (Z) Overflow | Level |
| PN Name Storm Period Change Surcharge Flood Overflow Act. | (m) |
| S1.000 S12 15 Summer 30 +40% | 2.100 |
| S1.001 S13 15 Summer 30 +40% | 1.931 |
| S1.002 S14 1440 Winter 30 +40% 30/60 Summer | 1.566 |
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| | | rage o |
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirm |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Drainage |
| Innovyze | Network 2020.1.3 | |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|------------|-------------------|
| S1.000 | S12 | -0.100 | 0.000 | 0.00 | | | 0.0 | OK | |
| S1.001 | S13 | -0.100 | 0.000 | 0.00 | | | 0.0 | OK | |
| S1.002 | S14 | 0.354 | 0.000 | 0.05 | | | 1.1 | SURCHARGED | |

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|--|---|--|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainage |
| File NLGEP Stormwater Model | Checked by | brainage |
| Innovyze | Network 2020.1.3 | |
| <u>100 year Return Period Summary</u> <u>1)</u> | of Critical Results by Maximum L for Catchment 2 | evel (Rank |
| | | |
| Si Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) Foul Sewage per hectare (l/s) | <pre>mulation Criteria 1.000 Additional Flow - % of Total Fl 0 MADD Factor * 10m³/ha Stora 0 Inlet Coeffiecie 0.500 Flow per Person per Day (l/per/da 0.000</pre> | ow 0.000 ge 2.000 nt 0.800 y) 0.000 |
| Number of Input Hydrogr Number of Online Cont Number of Offline Cont | aphs 0 Number of Storage Structures 1 rols 1 Number of Time/Area Diagrams 0 rols 0 Number of Real Time Controls 0 | |
| Synthe | etic Rainfall Details | |
| Rainfall Mode | EL FEH 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (1km | n) -0.025 | |
| D1 (1kr | n) 0.330 | |
| D2 (1K) D3 (1kr | 0.312 | |
| E (1kr | n) 0.300 | |
| F (1kr | a) 2.451 | |
| Cv (Summe) | c) 0.750 | |
| Cv (Winter | 0.840 | |
| Margin for Flood Risk Warr | aing (mm) 300. | . 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| Dì | CS Status OF | ΓF |
| Dī Taoat | 7D Status C |)N |
| Inert | a status t | JIN |
| | | |
| Profile(s) | Summer and Winte | er |
| Beturn Period(s) (Wears) | 1 30 10 | 10 |
| Climate Change (%) | 0, 40, 4 | 10 |
| | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | oo full. |
| | | Water |
| US/MH Return Clima PN Name Storm Period Chan | te First (X) First (Y) First (Z) Ove ge Surcharge Flood Overflow Z | erflow Level Act. (m) |
| \$1.000 \$12 15 Summer 100 +4 | 10% | 2.100 |
| S1.001 S13 15 Summer 100 +4 | 10% 10% 30/60 Summer | 1.931 |
| 51.002 514 1440 WINLEY 100 +4 | 10° 50/00 Summer | 1./8/ |
| | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

 100 year Return Period Summary of Critical Results by Maximum Level (Rank

 1) for Catchment 2

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|------------|-------------------|
| S1.000 | S12 | -0.100 | 0.000 | 0.00 | | | 0.0 | OK | |
| S1.001 | S13 | -0.100 | 0.000 | 0.00 | | | 0.0 | OK | |
| S1.002 | S14 | 0.575 | 0.000 | 0.06 | | | 1.2 | SURCHARGED | |

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|----------|----------------|--------------|--------------|----------------|----------------|----------------|-----------------------|---------------|--------------------|---|--------------------|--------------------|
| Camde | n M | ill | | | | | | | | | | |
| Lower | Br | isto | l Roa | d | | | | | | | | |
| Bath | | | | | | | | | | | N | licro |
| Date | 21/ | 02/2 | 022 0 | 9:36 | | De | esigned by | Stefa | an Gand | ler | n | rainage |
| File | NLG | EP S | tormw | ater | Model | Cł | necked by | | | | | ianiage |
| Innov | yze | | | | | Ne | etwork 202 | 0.1.3 | | | | |
| | | | STOR | M SEW | ER DESI | [GN bv | the Modif | ied R | ational | Metho | d | |
| | | | | - | | 1 | | | | | - | |
| | | | | Ne | twork I | Design | Table for | Catc | hment 3 | | | |
| | | | | | « – Ir | ndicates | s pipe capac | ity < : | flow | | | |
| PN | Le | ength (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | Base Flow (l/s) | n | HYD D SECT (1 | IA Sect | tion Ty | ype Auto Design |
| C1 00 | 0 00 | 017 | 0 115 | 100.2 | 0 1 2 0 | E 00 | 0.0 | 0 025 | $2 \rightarrow -1$ | | 1.2 0 | - |
| S1.00 | 0 22 1 32 | 2.543 | 0.115 | 199.3 | 0.130 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 500 | 1:3 Swa 1:3 Swa | ale 👖 |
| S1.00 | 2 31 | .620 | 0.158 | 200.1 | 0.141 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1:3 Swa | ale |
| S1.00 | 3 26 | 5.399 | 0.132 | 200.0 | 0.088 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 : 500 : | 1:3 Swa | ale 🔒 |
| s1.00 | 5 20 | .865 | 0.100 | 208.7 | 0.000 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1:3 Swa | ale 🔒 |
| | | | | | | | | | | | | |
| | | | | | N | etwork | Results 1 | 「able | | | | |
| | PN | Ra (mm | ain (/hr) | T.C. (mins) | US/IL Σ (m) | I.Area (ha) | a ΣBase Flow (l/s) | Foul (l/s) | Add Flo (1/s) | w Vel (m/s) | Cap (1/s) | Flow (1/s) |
| | | | 0.00 | 5 00 | 0.000 | 0 100 | | | | | C1 F | 17.0 |
| SI S1 | L.000 | J 5 1 5 | 0.00 | 5.89 | 2.300 | 0.130 | | 0.0 | 0. | 0 0.43 | 61.5 61.4 | 17.6 |
| S1 | 1.002 | 2 5 | 0.00 | 8.37 | 2.022 | 0.415 | 5 0 . 0 | 0.0 | 0. | 0 0.43 | 61.3 | 56.2 |
| S1 | 1.003 | 3 5 | 0.00 | 9.39 | 1.864 | 0.503 | 3 0.0 | 0.0 | 0. | 0 0.43 | 61.3« | 68.2 |
| S1 | L.004 1 004 | 45 55 | 0.00 | 11.31 | 1.732 | 0.503 | 3 0.0 | 0.0 | 0. | $\begin{array}{ccc} 0 & 0.55 \\ 0 & 0.42 \end{array}$ | 79.1 | 68.2 80 5 |
| | 1.00. | 5 5 | 0.00 | 12.14 | 1.200 | 0.595 | 0.0 | 0.0 | 0. | 0 0.42 | 00.1« | 00.5 |
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|---------------|----------------------|-------|----------------|----------|-------------|---------------------|---------------|--|--|--|--|
| Camden Mill | | | | | | | | | | | |
| Lower Bristo | l Road | | | | | | | | | | |
| Bath | | | | | | | Mirro | | | | |
| Date 21/02/2 | 022 09:36 | | Design | ed b | y Stefan | Gandler | Drainage | | | | |
| File NLGEP St | tormwater Model | ••• | Checke | d by | | | brainage | | | | |
| Innovyze | | | Networ | k 20 | 20.1.3 | | | | | | |
| | | | | | | | | | | | |
| | Area | Sumn | nary fo | r Ca | tchment 3 | 3 | | | | | |
| Pipe | DIMD | ртм | (D) | DTMD | Gross | Tmp | Pipe Total | | | | |
| Number | Туре | Nan | ne | (%) | Area (ha) | Area (ha) | (ha) | | | | |
| | | | | | | | | | | | |
| 1.000 | Classification | | Road | 75 30 | 0.154 | 0.116 | 0.116 | | | | |
| 1.001 | Classification | | Road | 75 | 0.182 | 0.013 | 0.136 | | | | |
| | Classification | | Grass | 30 | 0.026 | 0.008 | 0.144 | | | | |
| 1.002 | Classification | | Road | 75 | 0.177 | 0.133 | 0.133 | | | | |
| | Classification | | Grass | 30 | 0.027 | 0.008 | 0.141 | | | | |
| 1.003 | Classification | | Grass | 30 | 0.023 | 0.007 | 0.007 | | | | |
| | Classification | | Road | 75 | 0.108 | 0.081 | 0.088 | | | | |
| 1.004 | - | | - | 100 | 0.000 | 0.000 | 0.000 | | | | |
| 1.005 | Classification | | Grass | 30 | 0.049 | 0.015 | 0.015 | | | | |
| | Classification Det | entio | n Basin | 100 | 0.064 | 0.064 | 0.079 | | | | |
| | Classification | | Grass | 30 | 0.040 | 0.012 | 0.091 | | | | |
| | | | | | Total | Total | Total | | | | |
| | | | | | 0.900 | 0.595 | 0.595 | | | | |
| | Simulati | on C | riteria | a foi | c Catchme | nt 3 | | | | | |
| | | | | | | | | | | | |
| V | olumetric Runoff Co | eff O | .750 <i>P</i> | Addit | ional Flow | - % of Tot | al Flow 0.000 | | | | |
| | Areal Reduction Fact | tor 1 | .000 | M | ADD Factor | * 10m³/ha | Storage 2.000 | | | | |
| | Hot Start (min | ns) | 0 | | - | Inlet Coeff | iecient 0.800 | | | | |
| | Hot Start Level (1 | nm) | 0 Flo | ow per | r Person pe | er Day (l/p | er/day) 0.000 | | | | |
| Manhole H | eadloss Coeff (Globa | al) O | .500 | | | Run Time | e (mins) 60 | | | | |
| Foul Se | wage per hectare (1, | /s) 0 | .000 | | Outpu | ut Interval | (mins) 1 | | | | |
| | Number of Input Hyd | roara | nhs () N | umber | of Storag | e Structure | ag 1 | | | | |
| | Number of Online | Contr | ols 1 N | umber | of Time/A | rea Diagra | ms 0 | | | | |
| | Number of Offline | Contr | cols 0 N | umber | of Real T | ime Control | ls O | | | | |
| | | | | | | | | | | | |
| | Synt | theti | ic Rain | fall | Details | | | | | | |
| | | | - | | | _ | | | | | |
| | Rainfall | Mode | T | | | FEH | L | | | | |
| | Return Period (| years |) | | | 100 | | | | | |
| | FEH Kaintall V | ersio | 11 n CD 404 | 200 | 412400 00 (| 1999 19400 | | | | | |
| | Site Lo | (11 | 11 GB 486 | o∠∪U 4 | 4134UU SE 8 | 0 0 2 0 U 1 3 4 U U | | | | | |
| | | (11cm |) | | | -0.025 | | | | | |
| | דת גע | (1km |) | | | 0.330 | , , | | | | |
| | 2ע רח | (1 km |) | | | 0.312 | | | | | |
| | E. | (1 km |) | | | 0.300 |) | | | | |
| | <u>।</u> न | (1km |) | | | 2.451 | | | | | |
| | Summer | Storm | , S | | | Yes | | | | | |
| | Winter | Storm | S | | | Yes | 5 | | | | |
| | Cv (S | ummer |) | | | 0.750 |) | | | | |
| | Cv (W | inter |) | | | 0.840 |) | | | | |
| | Storm Duration | (mins |) | | | 30 |) | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | MILLO |
| File NICEP Stormwater Model | Checked by | Drainage |
| The Niger Scottiwater Model | Natural 2020 1 2 | |
| тшоууге | Network 2020.1.5 | |
| Online Cor | ntrols for Catchment 3 | |
| | | |
| | | |
| Orifice Manhole: S4, | DS/PN: S1.005, Volume (m ³): 88.4 | |
| | | |
| Diameter (m) 0.023 Discharge | e Coefficient 0.600 Invert Level (m) 1. | 200 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Dialitada |
| Innovyze | Network 2020.1.3 | |
| Storage Str | uctures for Catchment 3 | |
| Infiltration Basi | in Manhole: S4, DS/PN: S1.005 | |
| Inver Infiltration Coefficient Infiltration Coefficient | t Level (m) 1.200 Safety Factor 2.0 Base (m/hr) 0.00000 Porosity 1.00 Side (m/hr) 0.00000 | |
| Depth (m) Are | a (m²) Depth (m) Area (m²) | |
| 0.000 | 297.3 1.500 636.0 | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Diamada |
| Innovyze | Network 2020.1.3 | |
| | | |
| 1 year Return Period Summary of | Critical Results by Maximum Leve | el (Rank 1) |
| f | or Catchment 3 | |
| _ | | |
| | | |
| <u>Si</u> | mulation Criteria | 0.000 |
| Areal Reduction Factor Hot Start (mins) | 1.000 Additional Flow - % of Total Fl 0 MADD Factor * 10m ³ /ba Stora | ow 0.000 ap 2.000 |
| Hot Start Level (mm) | 0 Inlet Coeffiecie | nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/da | y) 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | |
| Number of Trout Hedres | caphe () Number of Storage Structures 1 | |
| Number of Online Cont | crols 1 Number of Time/Area Diagrams 0 | |
| Number of Offline Cont | crols 0 Number of Real Time Controls 0 | |
| | | |
| Synth | etic Rainfall Details | |
| Rainiali Mode FEH Rainfall Versi | el FEH | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (1kr | n) -0.025 | |
| D1 (1kr | n) 0.330 | |
| D2 (1ki | n) 0.312 | |
| D3 (Iki | (0.298) | |
| E (1K) F (1k) | n) 2.451 | |
| Cv (Summe | r) 0.750 | |
| Cv (Winter | r) 0.840 | |
| | | _ |
| Margin for Flood Risk War | ning (mm) 300. Timester 2 5 Second Incompate (Eutonder | 0 |
| Analysis D' | TIMESTED 2.5 Second Increment (Extended | ן ז די |
| ם יס | VD Status |)N |
| Inert | ia Status (|)N |
| | | |
| Profile(s) | Summer and Winte | r |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| Return Period(s) (years) | 1, 30, 10 | 00 |
| Climate Change (%) | 0, 40, 4 | 10 |
| | | |
| WARNING: Half Drain Time has no | t been calculated as the structure is to | o full. |
| | | |
| | | |
| | and a River (W) River (W) River (R) And | Water |
| US/MH Return Cli DN Name Storm Period Chi | mate First (X) First (Y) First (Z) Over | TIOW Level |
| | ange Salenarge F1004 OVEF110W A | |
| S1.000 S1 15 Winter 1 | +0% | 2.378 |
| \$1.001 \$2 15 Winter 1 | +0% | 2.293 |
| S1.002 S2 15 Winter 1 | +0% | 2.149 |
| S1.004 S2 15 Winter 1 | +0% | 2.UUI 1 852 |
| S1.005 S4 1440 Winter 1 | +0% | 1.576 |
| | | |
| | | |
| ©19 | 82-2020 Innovvze | |
| | | |

| BuroHappold Ltd | | Page 6 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 3</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.000 | S1 | -0.322 | 0.000 | 0.03 | | | 16.9 | OK | |
| S1.001 | S2 | -0.392 | 0.000 | 0.04 | | | 31.8 | OK | |
| S1.002 | S2 | -0.373 | 0.000 | 0.05 | | | 44.7 | OK | |
| S1.003 | S4 | -0.363 | 0.000 | 0.06 | | | 51.4 | OK | |
| S1.004 | S2 | -0.480 | 0.000 | 0.03 | | | 50.7 | OK | |
| S1.005 | S4 | -1.124 | 0.000 | 0.00 | | | 0.6 | OK | |

| Canden Mill Lower Bristol Road Bath Date 21/02/2022 09:36 File NLGRY Stormwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Pattor 1.000 Additional Flow - % of Total Flow 0.000 Not Start Level (mm) 0 McD Pattor - 10m/As Storage 2.000 Hon Start Level (mm) 0 McD Pattor - 10m/As Storage 2.000 Foul Sewage per hetare (1/s) 0.000 Foul Sewage per hetare (1/s) 0.000 Number of Thuit Rydrighs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Thure/Area Diagrams 0 Number of Online Controls 0 Number of Thure/Area Diagrams 0 Site Location Ge 486200 413400 SE 86200 13400 c (1km) 0.312 03 (1km) 0.330 02 (1km) 0.330 03 (1km) 0.298 E (1km) 0.300 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin for Flowd Risk Warning (sm) 300.0 Analysis Timeteg 2.5 Second Increment (Extended) DY Status 00 Margin first Change (s) 0, 40, 40 Margin first Change Surcharge Flowd Overflow Act. (sm) Status 00 Margin first 30 +408 Status 00 Mar | BuroHappold Ltd | | Page 7 |
|---|--|---|------------------------|
| Lover Bristol Road Bath Date 21/02/2022 09:36 File NLGSP Stormwater Model Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Factor 1.000 Additional Plow - % of Total Plow 0.000 Bot Start Level (mins) 0 MADP Factor 1.100*/As Storage 2.000 Bot Start Level (mins) 0 MADP Factor 1.100*/As Storage 2.000 Ranhole Readioss Coeff (Global) 0.500 Plow per Person per Day (L/per/day) 0.000 Foil Swame per bectare (L/3) 0.000 Number of Input Nydrographs 0 Number of Storage Structures 1 Number of Input Nydrographs 0 Number of Storage Structures 1 Number of Critical Catrols 1 Number of Time/Area Diagrams 0 Number of Critical Catrols 1 Number of Time/Area Diagrams 0 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Critical Catrols 0 Number of Storage Structures 1 Number of Statis 0 C (Nin) 2.21 DI (Nn) 0.239 Site Location Catrols 0 Number of Storage 0 13400 C (Ninter) 0.312 DI (Statis 0 OFF DVS Statis 0 OFF | Camden Mill | | |
| Bath Date 21/02/2022 09:36 File NLGEP Stormwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results Dy Maximum Level (Rank 1) for Catchment 3 30 year Return Return Class Dy Maximum Level (Rank 1) for Catchment 5 the Storetows 1 30 marinal Mather Dy Dy Critical 1 Number of Starge Structures 1 31 Number of Orline Controls 1 Number of Real Time Controls 0 32 Starget Dy Controls 1 Number of Real Time Controls 0 33 Starget Dy Controls 1 Number of Real Time Controls 0 34 Starget Dy Controls 1 Number of Real Time Controls 0 35 Starget Dy Controls 1 Number of Real Time Controls 0 35 Starget Dy Controls 1 Number of Real Time Controls 0 36 Starget Dy Controls 1 Number of Real Time Controls 0 37 Starget Dy Controls 1 Number of Real Time Controls 0 39 Starget Dy Controls 1 Number of Real Time Controls 0 30 Starget Dy Controls 1 Number of Real Time Controls 0 30 Starget Dy Controls 1 Starget Dy Controls 1 Number 0 30 Starget Dy Controls 1 Starget Dy Controls 1 | Lower Bristol Road | | |
| Date 21/02/2022 09:36 File NLGEP Stormwater Model Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Ret Start family 0 MADD Factor * 10m*/ha Storage 2.000 Not Start Level (mm) 0 File Coefficient 0.800 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Neter C (Summer) 0.750 C (Kimmer) 0.750 C (Winter) 0.8400 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DretIon(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Neturn Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. PN Name Storm Period Change Surcharge Flood Overflow Act. (m) Si.000 Si 1 15 Winter 30 +40% 2.4277 Si.001 Si 1 15 Winter 30 +40% 2.437 Si.002 Si 1 50 Ninter 30 +40% 2.437 Si.003 Si 1 15 Winter 30 +40% 2.437 Si | Bath | | Mirro |
| File NLGEP Stormwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Pactor * 10m ³ /ha Storage 3.000 Hot Start Level (mm) 0 Inlat Coefficient 0.800 Manbole Headloss Coeff (Global) 0.500 Flow per Person per Day (L/per/day) 0.000 Foul Sewage per hectare (L/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Of (Emm) 0.330 D (Ikm) 0.288 E (Ikm) 0.310 Na Status 00N Frofile(s) 00N Frofile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 D Status 0N Frofile(s) 00N Return Period (s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. PN Name Storm Period Change Surcharge Flood Overflow Act. (min) S1.000 S1 15 Ninter 30 +408 2.427 S1.000 S2 15 Ninter 30 +408 2.408 S1.000 S2 4140 Ninter 30 +408 2.408 S1.000 S2 4140 Ninter 30 +408 2.408 S1.000 S3 1440 Ninter 30 +408 2.408 S1.000 S3 1440 Ninter 30 +408 2.408 | Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainage |
| Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Pactor 1.000 Additional Plow - % of Total Flow 0.000 Bet Start (mins) 0 MADD Pactor * 10m*/ha Storage 2.000 Bet Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Readloss Coeff (Clobal) 0.500 Flow per Person per Day (L/per/day) 0.000 Foul Sewage per bectare (1/a) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Colline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Time/Area Diagrams | File NLGEP Stormwater Model | Checked by | Diamage |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start Level (mins) 0 MADD Factor * 10m*/ha Storage 2.000 Hot Start Level (may 0) Namber of Storage Structures 1 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Medel FEH Reinfall Wersion 1999 Site Location GB 486200 413400 SE 86200 13400 C (LMM) 0.330 D 2 (LMM) 0.300 F (LMM) 0.300 F (LMM) 0.300 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status 0N Frofile(S) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 C (Hanter Change (S) 0, 40, 40 KARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Margin 51 15 Ninter 30 +405 S1.000 S1 15 Ninter 30 +405 S1.001 S2 15 Ninter 30 +405 S1.002 S4 1440 Winter 30 +405 S1.003 S4 1440 Winter 30 +405 S1.005 S4 150 Ninter 30 +405 S1.005 S4 150 Nin | Innovyze | Network 2020.1.3 | |
| 30 year Refurt Period Summary of Critical Results by Maximum Level (Rahk 1) for Catchment 3 Simulation Criteria Areal Reduction Factor 1.000 Not Start Kevel (m) 0 Manhole Readloss Coeff (Global) 0.500 Flow per Ferson per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Real Time Controls 0 Number of Online Controls 1 Number of Real Time Controls 0 Number of Offine Controls 0 Number of Real Time Controls 0 Number of Offine Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FH FHH Rainfall Version 0.300 -0.025 D1 (tkm) 0.330 D2 (tkm) 0.330 D2 (tkm) 0.330 D2 (tkm) 0.340 Kargin for Flood Risk Narning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) OFF DVD Status ON Profile(s) Summer and Winter Profile(s) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Stall Drain Time has not been calculated as the structure is too full. WARNING: Stall Drain Time has not been calculated as the structure is too full. | 20 mars Datum Dawied Commence | f Quiting Decults he Manimum I are | |
| Intervention Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Bot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per bay (1/per/day) 0.000 Foul Sewage per hectare (1/a) 0.000 Number of Input Eydrographs 0 Number of Storage Structures 1 Number of Input Eydrographs 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH Rainfall Model FEH FEH Rainfall Version 0.025 D1 (km) 0.300 C (km) 0.312 D3 (km) 0.298 E (km) 0.300 F (km) 0.500 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status DTS Status ON Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status DTS Status ON Margin for Flood Risk Warning (mm) 300.0 Return | 30 year Return Period Summary o | r Catabrant 3 | rei (Rank I) |
| Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Not Start Level (m) 0 Intel Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Synthetic Rainfall Details FBH Rainfall Model FBH FER Rainfall Model FBH FER Rainfall Model FBH FE (1km) 0.330 D (1km) 0.300 F (1km) 0.730 C (Numeer) 0.840 Margin for Flood Risk Warning (mn) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DY Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 360, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 VS/ME Return Climate First (X) First (Y) First (2) Overflow Act. Name Form Period Change Surcharge Flood Overflow Act. | <u> </u> | or catchment 5 | |
| Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start Leval (mn) 0 Manhole Headloss Coeff (Global) 0.000 Full Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH FEH Rainfall Worsion 1 (km) 0.300 C (1km) 0.312 D3 (km) 0.300 FE (1km) 0.300 C (1km) 0.300 FC (1km) 0.300 FC (1km) 0.300 FC (1km) 0.300 FC (1km) 0.300 Margin for Flood Risk Warning (rmn) Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON Duration (s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 <td></td> <td></td> <td></td> | | | |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mm) 0 MAD Factor * 100*/ha Storage 2.000 Manbole Readioss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH FEH Rainfall Version 1999 Site Location GB 486200 413400 SE 86200 13400 C (1km) 0.330 D2 (1km) 0.312 D3 (1km) 0.300 F (1km) 2.4651 CV (Summer) 0.750 CV (Summer) 0.750 CV (Summer) 0.750 CV (Summer) 0.840 Margin for Flocd Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON Inertia Status ON Frofile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 460, 960, 1440 Return Period(s) (years) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Status 2.15 Name Storm Period Change Surcharge Flood Overflow Act. (m) S1.000 S1 15 Winter 30 +40% 2.477 S1.001 S2 115 Winter 30 +40% 2.431 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 | <u></u> | mulation Criteria | |
| <pre>not start (mins) 0 MAD Factor - 10m /AB storage 2.000 Not start Level (m) 0 Inlet Coefficient 0.800 Manhole Headloss Cceff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 1 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH Rainfall Version 1999 Site Location GB 466200 413400 SE 86200 13400 C (1km) 0.330 D2 (1km) 0.300 F (1km) 0.300 F (1km) 0.300 Nargin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) D15 Status ON Thertia Status ON Frofile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. (m) S1.000 S1 15 Winter 30 +40% C.401 (m) (m) (m) (m) (m) (m) (m) (m) (m) (m)</pre> | Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Manhole Headioss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FEH FEH Rainfall Version 1999 Site Location GB 486200 413400 SE 86200 13400 C (1km) 0.330 D2 (1km) 0.330 D2 (1km) 0.330 F (1km) 0.300 F (1km) 2.451 Cv (Summer) 0.750 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON DTS Status ON Forfile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Helf Drain Time has not been calculated as the structure is too full. WARNING: Helf Drain Time has not been calculated as the structure is too full. Status 2.477 S1.000 S1 15 Winter 30 +408 2.477 S1.001 S2 15 Winter 30 +408 2.400 S1.003 S4 140 Winter 30 +408 2.400 S1.004 S2 1440 Winter 30 +408 2.400 S1.005 S4 1440 Winter 30 +408 2.000 S1.005 S4 1440 Winter | Hot Start (mins) Hot Start Level (mm) | 0 MADD Factor * 10m³/ha Stora 0 Inlet Coefficcie | ige 2.000 ent 0.800 |
| Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Real Time Controls 0 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH FEH Rainfall Vorsion 1999 Site Location GB 486200 413400 SE 86200 13400 C (1km) -0.025 D1 (1km) 0.330 D2 (1km) 0.320 D2 (1km) 0.320 D3 (1km) 0.329 E (1km) 0.300 F (1km) 2.451 Cv (Summer) 0.750 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DTO Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 400, 400 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. S1.000 S1 15 Winter 30 +408 2.400 S1.001 S2 15 Winter 30 +408 2.400 S1.003 S4 1540 Winter 30 +408 2.400 S1.003 S4 1440 Winter 30 +408 2.400 S1.005 S4 1440 Winter 30 +408 2.400 S1.005 S4 1440 Winter 30 +408 2.400 S1.005 S4 1440 Winter 30 +408 2.400 | Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/da | y) 0.000 |
| Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH Rainfall Version 1999 Site Location GB 466200 413400 SE 85200 13400 C (1km) 0.330 D2 (1km) 0.330 D2 (1km) 0.330 D2 (1km) 0.330 D2 (1km) 0.330 D2 (1km) 0.300 F (1km) 0.300 F (1km) 0.300 F (1km) 0.300 F (1km) 0.340 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON Inertia Status ON Frofile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(a) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. S1.000 S1 15 Winter 30 +40% 2.477 S1.001 S2 15 Winter 30 +40% 2.400 S1.003 S4 15 Winter 30 +40% 2.400 S1.003 S4 15 Winter 30 +40% 2.400 S1.003 S4 1440 Winter 30 +40% 2.400 S1.005 S4 1440 Winter 30 +40% 2.400 S1.005 S4 1440 Winter 30 +40% 2.400 S1.005 S4 1440 Winter 30 +40% 2.080 | Foul Sewage per hectare (l/s) | 0.000 | |
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| Margin for Flood Risk Warning (mm) Analysis Timestep 2.5 Second Increment (Extended) DTS Status DVD Status DTS Status DVD Status DVD Status ON Profile (s) Return Period (s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period (s) (years) Climate Change (%) WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH Return Climate First (X) First (Z) Overflow Act. Name Storm Period Change Surcharge Flood S1.000 S1 15 Winter 30 +40% S1.002 S2 15 Winter 30 +40% S1.003 S4 15 Winter 30 +40% S1.005 S4 1440 Winter S1.005 S4 1440 Winter Mater (M) S1.005 S4 1440 Winter Mater (M) S1.005 S4 1440 Winter S1.005 S4 1440 Winter Mater (M) S1.005 S4 1440 Winter Mater (M) (M) (M) (M) (M) (M) (M) (M) | Cv (Winte | r) 0.840 | |
| Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Name Storm Period Change Surcharge Flood Overflow Act. (m) S1.000 S1 15 Winter 30 +40% 2.421 S1.002 S2 15 Winter 30 +40% 2.400 S1.003 S4 15 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% | Margin for Flood Risk War | ning (mm) 300 | .0 |
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| Duration (s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 140 Return Period (s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Water PN Name Storm Period Change Surcharge Flood Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$1 15 Winter 30 +40% 2.477 \$1.001 \$2 15 Winter 30 +40% 2.421 \$1.002 \$2 15 Winter 30 +40% 2.163 \$1.003 \$4 15 Winter 30 +40% 2.080 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | Drofile(a) | Cummon and Wint. | ər |
| Return Period(s) (years)1, 30, 100Climate Change (%)0, 40, 40WARNING: Half Drain Time has not been calculated as the structure is too full.WaterWaterWaterWaterWaterWaterWaterWaterWaterWaterWaterWaterWaterVS/MHReturn Climate First (X) First (Y) First (Z) OverflowLevelPNNameStormPeriod Change Surcharge Flood Overflow Act.(m)\$1.000\$115 Winter30+40%2.421\$1.001\$215 Winter30+40%2.300\$1.002\$215 Winter30+40%2.163\$1.003\$415 Winter30+40%2.080©1982-2020 Innovyze | Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 14 | 40 |
| Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. US/MH Return Climate First (X) First (Y) First (Z) Overflow Water PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$1 15 Winter 30 +40% 2.477 2.421 \$1.001 \$2 15 Winter 30 +40% 2.300 \$1.002 \$2 15 Winter 30 +40% 2.300 \$1.003 \$4 15 Winter 30 +40% 2.163 \$1.003 \$4 15 Winter 30 +40% 2.080 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | Return Period(s) (years) | 1, 30, 10 | 00 |
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| US/MH Return Climate First (X) First (Y) First (Z) Overflow Water PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$1 15 Winter 30 +40% 2.477 \$1.001 \$2 15 Winter 30 +40% 2.421 \$1.002 \$2 15 Winter 30 +40% 2.300 \$1.003 \$4 15 Winter 30 +40% 2.163 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | WARNING: Half Drain Time has no | t been calculated as the structure is to | oo full. |
| US/MH Return Climate First (X) First (Y) First (Z) Overflow Act. Level (m) \$1.000 \$1 15 Winter 30 +40% 2.477 2.421 \$1.001 \$2 15 Winter 30 +40% 2.300 2.300 \$1.002 \$2 15 Winter 30 +40% 2.163 \$1.003 \$4 15 Winter 30 +40% 2.080 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | | | |
| US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$1 15 Winter 30 +40% 2.477 \$1.001 \$2 15 Winter 30 +40% 2.421 \$1.002 \$2 15 Winter 30 +40% 2.300 \$1.003 \$4 15 Winter 30 +40% 2.163 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | | | Water |
| PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$1 15 Winter 30 +40% 2.477 \$1.001 \$2 15 Winter 30 +40% 2.421 \$1.002 \$2 15 Winter 30 +40% 2.300 \$1.003 \$4 15 Winter 30 +40% 2.163 \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 | US/MH Return Cli | .mate First (X) First (Y) First (Z) Over | rflow Level |
| S1.000 S1 15 Winter 30 +40% 2.477 S1.001 S2 15 Winter 30 +40% 2.421 S1.002 S2 15 Winter 30 +40% 2.300 S1.003 S4 15 Winter 30 +40% 2.163 S1.004 S2 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 | PN Name Storm Period Ch | ange Surcharge Flood Overflow Ad | ct. (m) |
| S1.000 S1 15 Winter 30 +40% 2.477 S1.001 S2 15 Winter 30 +40% 2.421 S1.002 S2 15 Winter 30 +40% 2.300 S1.003 S4 15 Winter 30 +40% 2.163 S1.004 S2 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 | C1 000 C1 15 Western 20 | 1408 | 0 477 |
| S1.001 S2 15 Winter 30 +40% 2.300 S1.003 S4 15 Winter 30 +40% 2.163 S1.004 S2 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 S1.005 S4 1440 Winter 30 +40% 2.080 | SI.000 SI 15 Winter 30 SI 001 S2 15 Winter 30 | +408 +408 | 2.4// 2.421 |
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| \$1.004 \$2 1440 Winter 30 +40% 2.080 \$1.005 \$4 1440 Winter 30 +40% 2.080 ©1982-2020 Innovyze \$1000000000000000000000000000000000000 | S1.003 S4 15 Winter 30 | +40% | 2.163 |
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| BuroHappold Ltd | | Page 8 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.223 | 0.000 | 0.14 | | | 73.1 | FLOOD RISK* | |
| S1.001 | S2 | -0.264 | 0.000 | 0.18 | | | 152.8 | FLOOD RISK* | |
| S1.002 | S2 | -0.222 | 0.000 | 0.26 | | | 220.1 | FLOOD RISK* | |
| S1.003 | S4 | -0.201 | 0.000 | 0.30 | | | 256.8 | FLOOD RISK* | |
| S1.004 | S2 | -0.252 | 0.000 | 0.01 | | | 11.9 | FLOOD RISK* | |
| S1.005 | S4 | -0.620 | 0.000 | 0.00 | | | 1.0 | OK | |

| BuroHappold Ltd | | Page 9 |
|--|---|-----------------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Drainage |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |
| | | |
| 100 year Return Period Summary | of Critical Results by Maximum L | evel (Rank |
| <u></u> | for catchinent 5 | |
| | | |
| <u>s</u> | imulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) Hot Start Level (mm) | 0 MADD Factor * 10m³/ha Stora 0 Inlet Coefficcie | ge 2.000 nt. 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (1/per/da | y) 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | |
| Number of Input Hydrog | raphs () Number of Storage Structures 1 | |
| Number of Online Con | trols 1 Number of Time/Area Diagrams 0 | |
| Number of Offline Con | trols 0 Number of Real Time Controls 0 | |
| Country | atia Dainfall Dataila | |
| Rainfall Mod | el FEH | |
| FEH Rainfall Versi | on 1999 | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | |
| C (1k | m) -0.025 | |
| | m) 0.330 m) 0.312 | |
| D3 (1k | m) 0.298 | |
| E (1k | m) 0.300 | |
| F (1k | m) 2.451 | |
| Cv (Summe | r) 0.750 | |
| CV (WINTE | r) 0.840 | |
| Margin for Flood Risk War | ning (mm) 300 | .0 |
| Analysis | Timestep 2.5 Second Increment (Extended | d) |
| | TS Status Ol | FF' |
| Inert | ia Status | ON |
| | | |
| Profile(s) | Summer and Winte | ar |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 14 | 40 |
| Return Period(s) (years) | 1, 30, 1 | 00 |
| Climate Change (%) | 0, 40, | 40 |
| | | |
| WARNING: Half Drain Time has no | t been calculated as the structure is to | oo full. |
| | | |
| | | Watan |
| | imate First (X) First (Y) First (Z) Ove | water rflow Level |
| PN Name Storm Period Ch | ange Surcharge Flood Overflow A | ct. (m) |
| | - | |
| S1.000 S1 15 Winter 100 | +40% | 2.522 |
| S1.002 S2 15 Winter 100 | +40% | 2.4/1 2 357 |
| S1.003 S4 1440 Winter 100 | +40% | 2.337 |
| S1.004 S2 1440 Winter 100 | +40% | 2.270 |
| S1.005 S4 1440 Winter 100 | +40% | 2.270 |
| | | |
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| ©19 | 982-2020 Innovyze | |
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| BuroHappold Ltd | | Page 10 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:36 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | * |

 100 year Return Period Summary of Critical Results by Maximum Level (Rank

 1) for Catchment 3

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.178 | 0.000 | 0.22 | | | 109.9 | FLOOD RISK* | |
| S1.001 | S2 | -0.214 | 0.000 | 0.27 | | | 231.4 | FLOOD RISK* | |
| S1.002 | S2 | -0.165 | 0.000 | 0.39 | | | 332.5 | FLOOD RISK* | |
| S1.003 | S4 | -0.093 | 0.000 | 0.02 | | | 15.6 | FLOOD RISK* | |
| S1.004 | S2 | -0.062 | 0.000 | 0.01 | | | 14.9 | FLOOD RISK* | |
| S1.005 | S4 | -0.430 | 0.000 | 0.00 | | | 1.1 | OK | |

| BuroHa | appold | Ltd | | | | | | | | | | Pag | e 1 | |
|---------|---------|-------------|--------|---------|--------|---------|--------------|--------|--------|-------------------|-------|---------|---------|----------|
| Camde | n Mill | | | | | | | | | | | | | |
| Lower | Brist | ol Roa | ad | | | | | | | | | | ÷ . | |
| Bath | | | | | | | | | | | | Mi | | |
| Date 3 | 21/02/ | 2022 (| 09:40 | | 1 | Desig | ned by | / Stei | fan Ga | andler | | | | |
| File 1 | NLGEP : | Storm | water | Model | | Check | ed by | | | | | DIC | III Idy | e |
| Innov | yze | | | | 1 | Netwo | rk 202 | 20.1.3 | 3 | | | | | _ |
| | - | | | | | | | | | | | | | _ |
| | | STOP | RM SEW | IER DES | SIGN b | y the | Modi | fied i | Ratio | nal Me | ethod | 1 | | |
| | | | | | | | | | | | | | | |
| | | | Ne | etwork | Desig | n Tab | le fo | r Cat | chment | <u> </u> | | | | |
| DN | Tonath | Fe11 | 61.eme | T 3moo | | Б | | 1- | _ | | | Costio | | 2 |
| PN | (m) | raii (m) | (1:X) | (ha) | (mins) | Flow | ase (1/s) | (mm) | 11 | SECT | (mm) | Sectio | птуре | Design |
| | ., | . , | | , | , | | () -) | . , | | | . , | | | |
| S1.000 | 48.949 | 0.245 | 199.8 | 0.023 | 5.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | 0 |
| S1.001 | 66.776 | 0.334 | 199.9 | 0.026 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | Ö |
| S1.002 | 67.044 | 0.335 | 200.1 | 0.033 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | |
| S1.003 | 64.503 | 0.321 | 200.9 | 0.032 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | e |
| s2.000 | 49.688 | 0.248 | 200.4 | 0.047 | 5.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | 8 |
| S2.001 | 66.782 | 0.334 | 199.9 | 0.050 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | ā |
| S2.002 | 66.782 | 0.334 | 199.9 | 0.060 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | ā |
| S2.003 | 64.366 | 0.322 | 199.9 | 0.056 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | ā |
| S2.004 | 14.030 | 0.047 | 298.5 | 0.018 | 0.00 |) | 0.0 | 0.600 | | 0 | 300 | Pipe/C | onduit | ē |
| S1 004 | 9 1 1 9 | 0 046 | 198 2 | 0 010 | 0 00 |) | 0 0 | | 0 035 | 3 \=/ | 500 | 1.3 | Swale | <u>a</u> |
| \$1.005 | 11.015 | 0.662 | 16.6 | 0.000 | 0.00 |) | 0.0 | | 0.035 | $3 \setminus = /$ | 500 | 1:3 | Swale | Ä |
| S1.006 | 13.331 | 0.067 | 199.0 | 0.083 | 0.00 |) | 0.0 | | 0.035 | 3 \=/ | 500 | 1:3 | Swale | ă |
| | | | | | | | | | | | | | | |
| | | | | 1 | Netwoi | ck Rea | sults | Table | 2 | | | | | |
| | PN I | Rain | T.C. | US/IL | Σ I.Ar | ea 5 | Base | Foul | Add | Flow | Vel | Cap | low | |
| | (n | m/hr) | (mins) | (m) | (ha) | Flc | w (1/s |) (1/s |) (1/ | /s) (1 | m/s) | (1/s) (| 1/s) | |
| 01 | 000 | | C 00 | 2 200 | 0 0 | <u></u> | 0 | 0 0 | 0 | 0 0 | 0 4 2 | C1 4 | 2 2 | |

| S1.000 | 50.00 | 6.89 2.300 | 0.023 | 0.0 | 0.0 | 0.0 | 0.43 | 61.4 | 3.2 |
|--------|-------|-------------|-------|-----|-----|-----|------|-------|------|
| S1.001 | 50.00 | 9.48 2.055 | 0.050 | 0.0 | 0.0 | 0.0 | 0.43 | 61.4 | 6.7 |
| S1.002 | 50.00 | 12.08 1.721 | 0.083 | 0.0 | 0.0 | 0.0 | 0.43 | 61.3 | 11.2 |
| S1.003 | 50.00 | 14.58 1.386 | 0.115 | 0.0 | 0.0 | 0.0 | 0.43 | 61.2 | 15.6 |
| | | | | | | | | | |
| S2.000 | 50.00 | 6.93 2.350 | 0.047 | 0.0 | 0.0 | 0.0 | 0.43 | 61.3 | 6.3 |
| S2.001 | 50.00 | 9.51 2.102 | 0.096 | 0.0 | 0.0 | 0.0 | 0.43 | 61.4 | 13.1 |
| S2.002 | 50.00 | 12.10 1.768 | 0.157 | 0.0 | 0.0 | 0.0 | 0.43 | 61.4 | 21.2 |
| S2.003 | 50.00 | 14.59 1.434 | 0.212 | 0.0 | 0.0 | 0.0 | 0.43 | 61.4 | 28.8 |
| S2.004 | 50.00 | 14.85 1.112 | 0.231 | 0.0 | 0.0 | 0.0 | 0.90 | 64.0 | 31.3 |
| | | | | | | | | | |
| S1.004 | 50.00 | 15.20 1.065 | 0.356 | 0.0 | 0.0 | 0.0 | 0.43 | 61.6 | 48.2 |
| S1.005 | 50.00 | 15.32 1.019 | 0.356 | 0.0 | 0.0 | 0.0 | 1.49 | 212.7 | 48.2 |
| S1.006 | 50.00 | 15.83 0.357 | 0.439 | 0.0 | 0.0 | 0.0 | 0.43 | 61.5 | 59.5 |

| BuroHappold I | Ltd | | | | | Page 2 |
|----------------|---------------------|---------------|----------|-------------|-------------|----------------|
| Camden Mill | | | | | | |
| Lower Bristo | L Road | | | | | |
| Bath | | | | | | Micco |
| Date 21/02/20 |)22 09:40 | Design | ed b | y Stefan | Gandler | |
| File NLGEP St | cormwater Model | Checke | d bv | - | | Drainag |
| | | Networ | k 20 | 20.1.3 | | |
| 111110 1 9 2 0 | | 11001101 | <u> </u> | 20.1.0 | | |
| | Area | Summary fo | or Ca | tchment 4 | 1 | |
| | | 4 | | | _ | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) |
| 1.000 | Classification | Road | 75 | 0.022 | 0.016 | 0.016 |
| | Classification | Grass | 30 | 0.024 | 0.007 | 0.023 |
| 1.001 | Classification | Road | 75 | 0.020 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.038 | 0.011 | 0.026 |
| 1.002 | Classification | Road | 75 | 0.023 | 0.018 | 0.018 |
| | Classification | Grass | 30 | 0.052 | 0.016 | 0.033 |
| 1.003 | Classification | Road | 75 | 0.021 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.055 | 0.017 | 0.032 |
| 2.000 | Classification | Road | 75 | 0.021 | 0.016 | 0.016 |
| | Classification | Grass | 30 | 0.031 | 0.009 | 0.025 |
| | Classification | Road | 75 | 0.019 | 0.014 | 0.039 |
| | Classification | Grass | 30 | 0.025 | 0.007 | 0.047 |
| 2.001 | Classification | Road | 75 | 0.020 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.031 | 0.009 | 0.024 |
| | Classification | Road | 75 | 0.018 | 0.014 | 0.038 |
| 0.000 | Classification | Grass | 30 | 0.040 | 0.012 | 0.050 |
| 2.002 | Classification | Road | 75 | 0.023 | 0.018 | 0.018 |
| | Classification | Grass | 30 | 0.035 | 0.011 | 0.028 |
| | Classification | Road | 75 | 0.021 | 0.016 | 0.044 |
| 0.000 | Classification | Grass | 30 | 0.053 | 0.016 | 0.060 |
| 2.003 | Classification | Road | 20 | 0.020 | 0.015 | 0.015 |
| | Classification | GLASS | 30 75 | 0.031 | 0.009 | 0.025 |
| | Classification | Craca | 30 | 0.019 | 0.014 | 0.039 |
| 2 004 | Classification | Boad | 75 | 0.000 | 0.017 | 0.007 |
| 2.004 | Classification | Grass | 30 | 0.005 | 0.007 | 0.007 |
| | Classification | Road | 75 | 0 008 | 0.004 | 0.016 |
| | Classification | Grass | 30 | 0.006 | 0.002 | 0.018 |
| 1.004 | Classification | Road | 75 | 0.009 | 0.007 | 0.007 |
| 1.001 | Classification | Grass | 30 | 0.011 | 0.003 | 0.010 |
| 1.005 | - | - | 100 | 0.000 | 0.000 | 0.000 |
| 1.006 | Classification Det | ention Basin | 100 | 0.059 | 0.059 | 0.059 |
| | Classification | Grass | 30 | 0.071 | 0.021 | 0.080 |
| | Classification | Grass | 30 | 0.011 | 0.003 | 0.083 |
| | | | | Total | Total | Total |
| | | | | 0.916 | 0.439 | 0.439 |
| | | | | | | |
| | Simulat | ion Criteri | a foi | Catchme | nt 4 | |
| | | | | | | |
| Vo | olumetric Runoff Co | beff 0.750 | Addit: | ional Flow | - % of Tot | al Flow 0.000 |
| 1 | Areal Reduction Fac | tor 1.000 | M | ADD Factor | * 10m³/ha | Storage 2.000 |
| | Hot Start (mi | Lns) 0 | |] | Inlet Coeff | tiecient 0.800 |
| M 1 | HOT START Level | (mm) 0 Flo | ow per | r Person pe | er Day (1/p | per/day) 0.000 |
| Manhole He | eaaloss Coeff (Glob | Dai) 0.500 | | 011+~1 | Kun Time | e (mins) 60 |
| rout Set | vage per nectare (1 | | | υιιρι | it interval | L (IIIIIII) L |
| | Number of Input Hy | drographs 0 N | lumber | of Storag | e Structur | es 1 |
| | Number of Online | Controls 1 N | lumber | of Time/A | rea Diagra | ms O |
| | | | | | | |
| | Number of Offline | Controls 0 N | lumber | of Real T | ime Contro | ls 0 |

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|-----------------------------|---|----------|
| Camden Mill | | ruge 5 |
| Lower Bristol Road | | |
| Bath | | |
| Date $21/02/2022$ 09.40 | Designed by Stefan Gandler | MICIO |
| File NICEP Stormwater Model | Charled by Steran Ganater | Drainage |
| The Niger Sconwacer Model | Notwork 2020 1 2 | |
| IIIIOvyze | Network 2020.1.5 | |
| Simulation (| Criteria for Catchment 4 | |
| | | |
| Synthet | ic Rainfall Details | |
| Rainfall Mode | el FEH | |
| Return Period (years | s) 100 | |
| FEH Rainfall Versio | on 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (lkr | -0.025 | |
| | n 0.330 | |
| D3 (1kr | n) 0.298 | |
| E (1kr | n) 0.300 | |
| F (1kr | n) 2.451 | |
| Summer Storr | ns Yes | |
| Winter Storr | ns Yes | |
| Cv (Summe) Cv (Winter | (1) (1) (1) (1) (2) | |
| Storm Duration (mins | s) 30 | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | MILIU |
| File NLGEP Stormwater Model | Checked by | Drainage |
| | Network 2020 1 3 | |
| 11110 1 2 2 0 | NCCWOIK 2020.1.5 | |
| Online Cor | ntrols for Catchment 4 | |
| | | |
| | | |
| Orifice Manhole: S4, | DS/PN: S1.006, Volume (m ³): 11.0 | |
| | | 257 |
| Diameter (m) 0.027 Discharge | e Coefficient 0.600 invert Level (m) 0. | 357 |
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| Burohappold Ltd | Page 5 |
| Camden Mill | |
| Lower Bristol Road | |
| Bath | Mirro |
| Date 21/02/2022 09:40 Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model Checked by | Drainage |
| Innovyze Network 2020.1.3 | L |
| | |
| Storage Structures for Catchment 4 | |
| | |
| | |
| Infiltration Basin Manhole: S4, DS/PN: S1.006 | |
| | |
| Invert Level (m) 0.357 Safety Factor 2.0 | |
| Infiltration Coefficient Side (m/hr) 0.00000 Porosity 1.00 | |
| | |
| Depth (m) Area (m ²) Depth (m) Area (m ²) Depth (m) Area (m ²) | |
| | |
| 0.000 404.1 0.300 523.7 0.800 600.9 | |
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| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | Micro | | | | | | | | | |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Desinado | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamage | | | | | | | | | |
| Innovyze | Network 2020.1.3 | 1 | | | | | | | | | |
| | | | | | | | | | | | |
| 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) | | | | | | | | | | | |
| <u>fc</u> | for Catchment 4 | | | | | | | | | | |
| | | | | | | | | | | | |
| Sir | nulation Criteria | | | | | | | | | | |
| Areal Reduction Factor | .000 Additional Flow - % of Total Fl | ow 0.000 | | | | | | | | | |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 | | | | | | | | | |
| Hot Start Level (mm) Manhole Headloss Coeff (Global) (| U Inlet Coefficie 1.500 Flow per Person per Day (1/per/da | nt 0.800 v) 0.000 | | | | | | | | | |
| Foul Sewage per hectare (1/s) |).000 | , | | | | | | | | | |
| | | | | | | | | | | | |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | | | | | | | | | | |
| Number of Offline Cont | rols 0 Number of Real Time Controls 0 | | | | | | | | | | |
| | | | | | | | | | | | |
| Synthe | tic Rainfall Details | | | | | | | | | | |
| FEH Bainfall Versio | л FEH n 1999 | | | | | | | | | | |
| Site Locatio | n GB 486200 413400 SE 86200 13400 | | | | | | | | | | |
| C (1km |) -0.025 | | | | | | | | | | |
| D1 (1km |) 0.330 | | | | | | | | | | |
| D2 (1km |) 0.312 | | | | | | | | | | |
| D3 (1km |) 0.298 | | | | | | | | | | |
| |) 0.500 | | | | | | | | | | |
| |) 0.750 | | | | | | | | | | |
| Cv (Winter |) 0.840 | | | | | | | | | | |
| | | | | | | | | | | | |
| Margin for Flood Risk Warn | ing (mm) 300. Timester 2 5 Second Increment (Extended | 0 | | | | | | | | | |
| DT | S Status OF | 'F' | | | | | | | | | |
| DV | D Status C | N N | | | | | | | | | |
| Inerti | a Status C | N | | | | | | | | | |
| | | | | | | | | | | | |
| Profile(s) | Summer and Winte | er | | | | | | | | | |
| Duration(s) (mins) 1 | 5, 30, 60, 120, 240, 360, 480, 960, 144 | 0 | | | | | | | | | |
| Return Period(s) (years) | 1, 30, 10 | 0 | | | | | | | | | |
| Climate Change (%) | 0,40,4 | 0 | | | | | | | | | |
| | | | | | | | | | | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | o full. | | | | | | | | | |
| | | | | | | | | | | | |
| | | Water | | | | | | | | | |
| US/MH Return Clima | ate First (X) First (Y) First (Z) Overf | low Level | | | | | | | | | |
| PN Name Storm Period Chan | ge Surcharge Flood Overflow Act | . (m) | | | | | | | | | |
| S1.000 S1 15 Winter 1 | +0% | 2.330 | | | | | | | | | |
| S1.001 S2 15 Winter 1 | +0% | 2.098 | | | | | | | | | |
| S1.002 S2 15 Winter 1 | +0% | 1.775 | | | | | | | | | |
| S1.003 S4 15 Winter 1 | F0% | 1.446 | | | | | | | | | |
| S2.000 S2 15 Winter 1 | F0% | 2.394 | | | | | | | | | |
| S2.001 S5 15 Winter 1 | +0% | 2.162 | | | | | | | | | |
| S2.002 S4 15 Winter 1 | ⊦U% ⊾∩≥ | 1.842 | | | | | | | | | |
| 52.003 50 15 WINLER I | | 1.31/ | | | | | | | | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | · |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 4</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.000 | S1 | -0.370 | 0.000 | 0.01 | | | 3.0 | OK | |
| S1.001 | S2 | -0.457 | 0.000 | 0.01 | | | 5.6 | OK | |
| S1.002 | S2 | -0.446 | 0.000 | 0.01 | | | 8.3 | OK | |
| S1.003 | S4 | -0.440 | 0.000 | 0.01 | | | 10.6 | OK | |
| S2.000 | S2 | -0.306 | 0.000 | 0.02 | | | 5.8 | OK | |
| S2.001 | S5 | -0.440 | 0.000 | 0.01 | | | 10.4 | OK | |
| S2.002 | S4 | -0.426 | 0.000 | 0.02 | | | 15.5 | OK | |
| S2.003 | S8 | -0.417 | 0.000 | 0.02 | | | 19.4 | OK | |

| BuroHappold Ltd | | Page 8 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 4</u>

| | | | | | | | | | Water |
|---------|-------|-------------|--------|---------|--------------|-----------|-----------|----------|-------|
| | US/MH | | Return | Climate | First (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | Storm | Period | Change | Surcharge | Flood | Overflow | Act. | (m) |
| ~~ ~~ . | ~ ~ ~ | | | | 00/15 0 | | | | |
| S2.004 | 53 | 15 Winter | T | +0% | 30/15 Summer | | | | 1.229 |
| S1.004 | S2 | 15 Winter | 1 | +0% | | | | | 1.170 |
| S1.005 | S3 | 15 Winter | 1 | +0% | | | | | 1.073 |
| S1.006 | S4 | 1440 Winter | 1 | +0% | | | | | 0.576 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S2.004 | S3 | -0.183 | 0.000 | 0.32 | | | 19.9 | OK* | |
| S1.004 | S2 | -1.441 | 0.000 | 0.00 | | | 30.8 | OK | |
| S1.005 | S3 | -0.446 | 0.000 | 0.01 | | | 30.8 | OK | |
| S1.006 | S4 | -0.581 | 0.000 | 0.00 | | | 0.7 | OK | |

| BuroHappold Ltd | | Page 9 |
|--|--|-------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamaye |
| Innovyze | Network 2020.1.3 | |
| | | |
| 30 year Return Period Summary of | Critical Results by Maximum Lev | el (Rank 1) |
| <u><u>f</u>c</u> | or Catchment 4 | |
| | | |
| c i, | mulation Criteria | |
| Areal Reduction Factor | L.000 Additional Flow - % of Total Flo | ow 0.000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 |
| Hot Start Level (mm) | 0 Inlet Coeffiecie | nt 0.800 |
| Manhole Headloss Coeff (Global) (Foul Sewage per hectare (1/s) (|).500 Flow per Person per Day (l/per/da).000 | y) 0.000 |
| | | |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols 1 Number of Time/Area Diagrams 0 | |
| Number of Offfine Conc | rois o Number of Real lime controls o | |
| Synthe | tic Rainfall Details | |
| Rainfall Mode | 1 FEH | |
| FEH Rainfall Versio | n 1999 n CR 486200 412400 SE 86200 12400 | |
| C (1km | $\begin{array}{c} \text{II GB} 488200 & 413400 & \text{SE} 88200 & 13400 \\ -0.025 & -0.025 \end{array}$ | |
| D1 (1km |) 0.330 | |
| D2 (1km |) 0.312 | |
| D3 (1km |) 0.298 | |
| E (1km |) 0.300 | |
| F (1km |) 2.451 | |
| Cv (Summer |) 0.750 | |
| Cv (Winter |) 0.840 | |
| Margin for Flood Risk Warn | ing (mm) 300. | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| DT | S Status OF | 'F |
| DV | D Status C |)N |
| Inerti | a Status C |)N |
| | | |
| Profile(s) | Summer and Winte | er |
| Duration(s) (mins) i Return Period(s) (years) | 5, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| Climate Change (%) | 0, 40, 4 | 10 |
| | -,, - | - |
| WARNING, Half Drain Time has not | been colculated as the structure is to | - full |
| WARNING: HAIT DIAIN TIME HAS NOT | been calculated as the structure is to | o lull. |
| | | |
| | | Water |
| US/MH Return Clima | ate First (X) First (Y) First (Z) Overf | low Level |
| PN Name Storm Period Chan | ge Surcharge Flood Overflow Act | (m) |
| S1.000 S1 15 Winter 30 +4 | 40% | 2.367 |
| S1.001 S2 15 Winter 30 +4 | 10% | 2.156 |
| S1.002 S2 15 Winter 30 +4 | 10% | 1.844 |
| S1.003 S4 15 Winter 30 +4 | 10% | 1.524 |
| S2.000 S2 15 Winter 30 +4 | 10% | 2.448 |
| 52.001 55 15 Winter 30 +4 | ±U♂ 1∧∿ | 2.239 |
| S2.002 S4 IS WINLER S0 +4 | 10% 10% | 1,619 |
| | | 1.019 |
| ©198 | 32-2020 Innovyze | |

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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 4

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.333 | 0.000 | 0.03 | | | 12.7 | OK | |
| S1.001 | S2 | -0.399 | 0.000 | 0.03 | | | 25.5 | OK | |
| S1.002 | S2 | -0.377 | 0.000 | 0.05 | | | 39.4 | OK | |
| S1.003 | S4 | -0.362 | 0.000 | 0.06 | | | 49.9 | OK | |
| S2.000 | S2 | -0.252 | 0.000 | 0.07 | | | 25.3 | FLOOD RISK* | |
| S2.001 | S5 | -0.363 | 0.000 | 0.06 | | | 48.8 | OK | |
| S2.002 | S4 | -0.332 | 0.000 | 0.08 | | | 71.9 | OK | |
| S2.003 | S8 | -0.315 | 0.000 | 0.11 | | | 89.5 | OK | |

| BuroHappold Ltd | | Page 11 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

$\frac{30 \text{ year Return Period Summary of Critical Results by Maximum Level (Rank 1)}{\text{for Catchment 4}}$

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|---------------|-------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|-----------------------|
| S2.004 | S3 | 15 Winter | 30 | +40% | 30/15 Summer | | | | 1.439 |
| S1.004 | S2 | 15 Winter | 30 | +40% | | | | | 1.260 |
| S1.005 | S3 | 15 Winter | 30 | +40% | | | | | 1.129 |
| S1.006 | S4 | 1440 Winter | 30 | +40% | | | | | 0.969 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S2.004 | S 3 | 0.027 | 0.000 | 1.21 | | | 74.2 | SURCHARGED* | |
| S1.004 | S2 | -1.351 | 0.000 | 0.01 | | | 116.9 | OK | |
| S1.005 | S3 | -0.390 | 0.000 | 0.04 | | | 117.1 | OK | |
| S1.006 | S4 | -0.188 | 0.000 | 0.00 | | | 1.2 | FLOOD RISK* | |

| BuroHappold Ltd | | Page 12 |
|--|--|-------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | . Checked by | Diamaye |
| Innovyze | Network 2020.1.3 | |
| | | |
| 100 year Return Period Summar | y of Critical Results by Maximum I | Level (Rank |
| 1) | for Catchment 4 | |
| | | |
| | imulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | Low 0.000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | age 2.000 |
| Hot Start Level (mm) | 0 Inlet Coefficie | ent 0.800 |
| Manhole Headloss Coeff (Global) Foul Sewage per bectare (1/s) | 0.500 Flow per Person per Day (1/per/da | ay) 0.000 |
| iour bewage per neccure (1,3) | 0.000 | |
| Number of Input Hydrod | graphs 0 Number of Storage Structures 1 | |
| Number of Online Con | ntrols 1 Number of Time/Area Diagrams 0 | |
| Number of Offline Con | itrols U Number of Real Time Controls U | |
| Synt | hetic Rainfall Details | |
| Rainfall Mo | del FEH | |
| FEH Rainfall Vers | ion 1999 | |
| Site Locat | $\begin{array}{r} \text{LOII} \text{GB} 486200 413400 \text{SE} 86200 13400 \\ -0 0.25 \end{array}$ | |
| D1 (1 | km) 0.330 | |
| D2 (1 | km) 0.312 | |
| D3 (1 | km) 0.298 | |
| E (1 | km) 0.300 | |
| F (1 | km) 2.451 | |
| Cv (Summ Cv (Wint | (0.750) | |
| | | |
| Margin for Flood Risk Wa | rning (mm) 300 | .0 |
| Analysi | s Timestep 2.5 Second Increment (Extende | d) |
| | DVD Status 0 | ON |
| Iner | tia Status | ON |
| | | |
| Profile(s) | Summer and Wint | er |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 14 | 40 |
| Return Period(s) (years) | 1, 30, 1 | 00 |
| Climate Change (%) | 0, 40, | 40 |
| | | |
| WARNING: Half Drain Time has n | ot been calculated as the structure is t | oo full. |
| | | |
| | | Wator |
| US/MH Return Cli | mate First (X) First (Y) First (Z) Over | flow Level |
| PN Name Storm Period Ch | ange Surcharge Flood Overflow Ac | t. (m) |
| | | 0 005 |
| SI.000 SI IS Winter 100 | +408 | 2.385 |
| S1.002 S2 15 Winter 100 | +40% | 1.873 |
| S1.003 S4 15 Winter 100 | +40% | 1.555 |
| S2.000 S2 15 Winter 100 | +40% | 2.471 |
| S2.001 S5 15 Winter 100 | +40% | 2.272 |
| S2.002 S4 15 Winter 100 | +40% | 1.974 |
| S2.003 S8 15 Winter 100 | +4U3 | 1.657 |
| ©1 | 982-2020 Innovyze | |
| | | |

| BuroHappold Ltd | | Page 13 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

100 year Return Period Summary of Critical Results by Maximum Level (Rank1) for Catchment 4

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.315 | 0.000 | 0.04 | | | 19.1 | OK | |
| S1.001 | S2 | -0.379 | 0.000 | 0.04 | | | 38.2 | OK | |
| S1.002 | S2 | -0.348 | 0.000 | 0.07 | | | 58.1 | OK | |
| S1.003 | S4 | -0.331 | 0.000 | 0.09 | | | 74.1 | OK | |
| S2.000 | S2 | -0.229 | 0.000 | 0.10 | | | 38.0 | FLOOD RISK* | |
| S2.001 | S5 | -0.330 | 0.000 | 0.09 | | | 73.6 | OK | |
| S2.002 | S4 | -0.294 | 0.000 | 0.13 | | | 109.0 | FLOOD RISK* | |
| S2.003 | S8 | -0.277 | 0.000 | 0.16 | | | 134.7 | FLOOD RISK* | |

| BuroHappold Ltd | | Page 14 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:40 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

100 year Return Period Summary of Critical Results by Maximum Level (Rank1) for Catchment 4

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|---------------|-------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|-----------------------|
| S2.004 | S3 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 1.533 |
| S1.004 | S2 | 15 Winter | 100 | +40% | | | | | 1.299 |
| S1.005 | S3 | 15 Winter | 100 | +40% | | | | | 1.152 |
| S1.006 | S4 | 1440 Winter | 100 | +40% | | | | | 1.136 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S2.004 | S3 | 0.121 | 0.000 | 1.74 | | | 106.9 | SURCHARGED* | |
| S1.004 | S2 | -1.312 | 0.000 | 0.01 | | | 171.3 | OK | |
| S1.005 | S3 | -0.367 | 0.000 | 0.06 | | | 171.6 | OK | |
| S1.006 | S4 | -0.021 | 0.000 | 0.00 | | | 1.3 | FLOOD RISK* | |

| BuroHappold Ltd | | Page 1 |
|-----------------------------|----------------------------|-----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:41 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Drainacje |
| Innovyze | Network 2020.1.3 | |
| | | |

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Catchment 5

| PN | Length | Fall | Slope | I.Area | T.E. | Ba | ise | n | HYD | DIA | Section Type | Auto |
|--------|--------|-------|-------|--------|--------|------|-------|-------|-------|------|--------------|--------|
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow | (l/s) | | SECT | (mm) | | Design |
| S1.000 | 6.415 | 0.043 | 149.2 | 0.415 | 10.00 | | 0.0 | 0.035 | 3 \=/ | 500 | 1:3 Swale | • |
| S1.001 | 19.862 | 1.000 | 19.9 | 0.000 | 0.00 | | 0.0 | 0.035 | 3 \=/ | 500 | 1:3 Swale | ē |
| S1.002 | 39.928 | 0.683 | 58.5 | 0.079 | 0.00 | | 0.0 | 0.035 | 3 \=/ | 500 | 1:3 Swale | ē |

Network Results Table

| PN | Rain | T.C. | US/IL | Σ I.Area | ΣВ | ase | Foul | Add Flow | Vel | Cap | Flow |
|--------|---------|--------|-------|----------|------|-------|-------|----------|-------|-------|-------|
| | (mm/hr) | (mins) | (m) | (ha) | Flow | (l/s) | (l/s) | (1/s) | (m/s) | (l/s) | (l/s) |
| s1.000 | 50.00 | 10.21 | 1.835 | 0.415 | | 0.0 | 0.0 | 0.0 | 0.50 | 71.0 | 56.2 |
| S1.001 | 50.00 | 10.46 | 1.792 | 0.415 | | 0.0 | 0.0 | 0.0 | 1.37 | 194.7 | 56.2 |
| S1.002 | 50.00 | 11.29 | 0.792 | 0.494 | | 0.0 | 0.0 | 0.0 | 0.80 | 113.5 | 66.9 |

| BuroHappold L | td | | | | | Page 2 | | | | | | | |
|--|------------------------------|------------------|--------|-------------|---------------------|----------------|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | | | |
| Lower Bristol | Road | | | | | | | | | | | | |
| Bath | | | | | | Micco | | | | | | | |
| Date 21/02/20 | 22 09:41 | Design | ed by | v Stefan | Gandler | | | | | | | | |
| File NLGEP St | ormwater Model | Checke | d bv | 2 | | Urainage | | | | | | | |
| Innovyze | | Networ | k 202 | 20.1.3 | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Area Summary for Catchment 5 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Pipe | PIMP PI | MP | PIMP | Gross | Imp. | Pipe Total | | | | | | | |
| Number | туре Na | me | (*) | Area (ha) | Area (ha) | (na) | | | | | | | |
| 1.000 | Classification | Road | 75 | 0.543 | 0.407 | 0.407 | | | | | | | |
| | Classification | Grass | 30 | 0.025 | 0.007 | 0.415 | | | | | | | |
| 1.001 | - | - | 100 | 0.000 | 0.000 | 0.000 | | | | | | | |
| 1.002 | Classification Detenti | on Basin | 100 | 0.043 | 0.043 | 0.043 | | | | | | | |
| | Classification | Grass | 30 | 0.120 | 0.036 | 0.079 | | | | | | | |
| | | | | Total | Total | Total | | | | | | | |
| | | | | 0.731 | 0.494 | 0.494 | | | | | | | |
| | Simulation | Criteria | a for | Catchme | nt 5 | | | | | | | | |
| | 01 | 01100110 | | | <u></u> | | | | | | | | |
| Vo | lumetric Runoff Coeff | 0.750 <i>P</i> | Additi | lonal Flow | - % of Tot | al Flow 0.000 | | | | | | | |
| A | real Reduction Factor | 1.000 | MZ | ADD Factor | * 10m³/ha | Storage 2.000 | | | | | | | |
| | Hot Start (mins) | 0 | | | nlet Coeff | iecient 0.800 | | | | | | | |
| | Hot Start Level (mm) | 0 Flc | w per | Person pe | er Day (1/p | per/day) 0.000 | | | | | | | |
| Manhole He | adloss Coeff (Global) | 0.500 | 1 - | 1 | Run Time | e (mins) 60 | | | | | | | |
| Foul Sew | age per hectare (1/s) | 0.000 | | Outpi | it Interval | (mins) 1 | | | | | | | |
| | 5 1 | | | 1 | | · · · | | | | | | | |
| N | Number of Input Hydrogr | aphs 0 N | umber | of Storag | e Structure | es 1 | | | | | | | |
| | Number of Online Cont | rols 1 N | umber | of Time/A | rea Diagrar | ms O | | | | | | | |
| | Number of Offline Cont | rols 0 N | umber | of Real T | ime Control | ls O | | | | | | | |
| | | | | | | | | | | | | | |
| | Synthet | ic Rain | fall | Details | | | | | | | | | |
| | | 7 | | | | | | | | | | | |
| | Rainiali Mod | el | | | FEH 100 | | | | | | | | |
| | Return Period (year | S) | | | 100 | | | | | | | | |
| | FER Rainiali Versi | 011 on CP 196 | 200 / | 113400 CE (| 1999 26200 13400 | | | | | | | | |
| | C (1k | m) | 200 - | 113400 SE (| -0 025 | | | | | | | | |
| | D1 (11- | , m) | | | 0.023 | | | | | | | | |
| | D1 (1K | , m) | | | 0.330 | | | | | | | | |
| | D2 (1K | m) | | | 0 298 | | | | | | | | |
| | E (1k | , m) | | | 0.300 | | | | | | | | |
| | F (1k | , m) | | | 2.451 | | | | | | | | |
| | Summer Stor | ms | | | Yes | ; | | | | | | | |
| | Winter Stor | ms | | | Yes | 5 | | | | | | | |
| | Cv (Summe | r) | | | 0.750 | | | | | | | | |
| | Cv (Winte | r) | | | 0.840 | 1 | | | | | | | |
| | Storm Duration (min | s) | | | 30 |) | | | | | | | |
| EuroHappold Ltd Page 2 Canden Mill Designed by Stefan Gandler Date 21/02/2022 09:41 Designed by Stefan Gandler File NLGEP Stormwater Model Checked by Innovyze Network 2020.1.3 Metwork 2020.1.3 Metwork 2020.1.3 Metwork 2020.1.3 Metwork 2020.1.3 Network 2020.1.3 Metwork 2020.1.3 Network 2020.1.3 Metwork 2020.1.3 Metwork 2020.1.3 Network 2020.1.3 Metwork 2020.1.3 Met | | | | | | | | | | | | | |
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| BuroHappold Ltd | | Page 3 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | |
| Date 21/02/2022 09:41 | Designed by Stefan Gandler | MILLO |
| File NLCEP Stormwater Model | Checked by | Drainage |
| | Network 2020 1 3 | |
| 11110 4 9 2 6 | Network 2020.1.5 | |
| Online Cor | ntrols for Catchment 5 | |
| | | |
| | | |
| Orifice Manhole: S3, | DS/PN: S1.002, Volume (m ³): 23.0 | |
| | | 700 |
| Diameter (m) 0.020 Discharge | e Coefficient 0.600 invert Level (m) 0. | /92 |
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| BuroHappold Ltd | | Page 4 | | | | | | | | | |
|--|-----------------------------|----------|--|--|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | | | | | | | | | | |
| Date $21/02/2022$ 09.41 | Designed by Stefan Gandler | - MICLO | | | | | | | | | |
| Eile NICED Stormustor Model | Checked by | Drainage | | | | | | | | | |
| The second of the second secon | Nature 2020 1 2 | _ | | | | | | | | | |
| | | | | | | | | | | | |
| Storage Str | uctures for Catchment 5 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Tank or Pond N | Manhole: S3, DS/PN: S1.002 | | | | | | | | | | |
| | | | | | | | | | | | |
| Inve | ert Level (m) 0.792 | | | | | | | | | | |
| Depth (m) Are | ea (m²) Depth (m) Area (m²) | | | | | | | | | | |
| 0.000 | 165.5 1.500 434.4 | | | | | | | | | | |
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| BuroHappold Ltd | | Page 5 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:41 | Designed by Ste | fan Gandler |
| File NLGEP Stormwater Model | . Checked by | Diamage |
| Innovyze | Network 2020.1. | 3 |
| | | |
| <u>1 year Return Period Summary</u> | of Critical Result | s by Maximum Level (Rank 1) |
| | ior Catchment 5 | |
| | | |
| | Simulation Criteria | |
| Areal Reduction Facto | r 1.000 Additional | Flow - % of Total Flow 0.000 |
| Hot Start (mins Hot Start Level (mm |) 0 MADD Fa | ctor * 10m ³ /ha Storage 2.000 |
| Manhole Headloss Coeff (Global | 0.500 Flow per Pers | on per Day (l/per/day) 0.000 |
| Foul Sewage per hectare (l/s | 0.000 | |
| Number of Trent Hadre | www.headaracter.com | 0 |
| Number of Input Hydro Number of Online Co | graphs 0 Number of St ntrols 1 Number of Ti | me/Area Diagrams 0 |
| Number of Offline Co | ntrols 0 Number of Re | eal Time Controls 0 |
| | | |
| Bainfall M | chetic Rainfall Detail | . <u>s</u> FFH |
| FEH Rainfall Vers | sion | 1999 |
| Site Locat | ion GB 486200 413400 | SE 86200 13400 |
| C (1 | .km) | -0.025 |
| D1 (1 D2 (1 | .km) | 0.312 |
| D3 (1 | .km) | 0.298 |
| E (1 | .km) | 0.300 |
| F (] Cvz (Summ | .km) Der) | 2.451 |
| Cv (Vint | er) | 0.840 |
| | | |
| Margin for Flood Risk Wa | rning (mm) | 300.0 |
| Alialys | DTS Status | OFF |
| | DVD Status | ON |
| Ine | tia Status | ON |
| | | |
| Profile(s) | | Summer and Winter |
| Duration(s) (mins) | 15, 30, 60, 120, 240 |), 360, 480, 960, 1440 |
| Climate Change (%) | | 0, 40, 40 |
| | | |
| | | |
| US/MH Beturn C | limate First (X) Firs | Water t (Y) First (Z) Overflow Level |
| PN Name Storm Period 0 | Change Surcharge Fl | ood Overflow Act. (m) |
| | | |
| S1.000 S1 15 Winter 1 S1.001 S2 15 Winter 1 | +0% +0% | 1.943 1 854 |
| S1.002 S3 1440 Winter 1 | +0% | 1.284 |
| | | |
| Complement Plants | ** - 1 4 | 5 Drain Dina |
| US/MH Depth Volume | Hali Flow / Overflow 『 | Time Flow Level |
| PN Name (m) (m ³) | Cap. (1/s) (n | nins) (1/s) Status Exceeded |
| | 0.04 | |
| S1.000 S1 -0.392 0.000 S1.001 S2 -0.481 0.000 | 0.04 | 37.5 OK 37.5 OK |
| | 982-2020 Tppowero | |
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| BuroHappold Ltd | | Page 6 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:41 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 5</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.002 | S3 | -1.009 | 0.000 | 0.00 | | | 0.6 | OK | |

| BuroHappold Ltd | | Page 7 |
|---|--|--|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:41 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |
| | | |
| 30 year Return Period Summary o | f Critical Results by Maximum Lev | el (Rank 1) |
| <u><u>f</u></u> | or Catchment 5 | |
| | | |
| Si | mulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Flo | ow 0.000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 |
| Hot Start Level (mm) Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (1/per/da | nt 0.800 v) 0.000 |
| Foul Sewage per hectare (1/s) | 0.000 | <i>,</i> , , , , , , , , , , , , , , , , , , |
| | | |
| Number of Input Hydrog: | raphs 0 Number of Storage Structures 1 | |
| Number of Offline Cont | trols 0 Number of Real Time Controls 0 | |
| | | |
| Synth Dainfall Mad | etic Rainfall Details | |
| FEH Bainfall Versi | on 1999 | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | |
| C (1k | m) -0.025 | |
| D1 (1ki | m) 0.330 | |
| | m) U.312 m) 0.298 | |
| E (1ki | m) 0.300 | |
| F (1ki | m) 2.451 | |
| Cv (Summe | r) 0.750 | |
| Cv (Winte | r) 0.840 | |
| Margin for Flood Risk War | ning (mm) 300. | . 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| D | TS Status OF | Έ |
| D Inert | ia Status (|)N |
| | | |
| | | |
| Profile(s) Duration(s) (mins) | Summer and Winte 15, 30, 60, 120, 240, 360, 480, 960, 144 |)r 10 |
| Return Period(s) (years) | 1, 30, 10 | 0 |
| Climate Change (%) | 0, 40, 4 | łO |
| | | |
| | | Water |
| US/MH Return Cli | .mate First (X) First (Y) First (Z) Over | flow Level |
| PN Name Storm Period Cha | ange Surcharge Flood Overflow Ac | :t. (m) |
| S1.000 S1 15 Winter 30 | +40% | 2 058 |
| S1.001 S2 1440 Winter 30 | +40% | 2.011 |
| S1.002 S3 1440 Winter 30 | +40% | 2.011 |
| | | |
| Surcharged Flooded | Half Drain Pipe | |
| US/MH Depth Volume Flo | w / Overflow Time Flow | Level |
| PN Name (m) (m ³) Ca | np. (l/s) (mins) (l/s) Status | Exceeded |
| S1 000 S1 _0 277 0 000 0 | | SK * |
| S1.001 S2 -0.324 0.000 C | 0.00 9.8 | OK |
| | 82-2020 Innovvze | |
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| Camden | Mill | | | | | | | | |
| Lower B | risto | l Road | | | | | | | |
| Bath | | | | | | | | | Micro |
| Date 21 | /02/2 | 022 09:41 | | Ι | esigned | by Stefan | Gandl | er | Desinado |
| File NL | GEP St | tormwater | Model . | | Checked b | У | | | Diamaye |
| Innovyz | е | | | 1 | Network 2 | 020.1.3 | | | |
| | | | | | | | | | |
| <u>30 year</u> | r Retu | rn Period | Summar | y of | Critical | Results b | y Max | imum Leve | el (Rank 1) |
| | | | | for | Catchme | nt 5 | | | |
| | | | | | | | | | |
| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
| | US/MH | Depth | Volume | Flow | / Overflow | 7 Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (1/s) | Status | Exceeded |
| s1.002 | S3 | -0.282 | 0.000 | 0.0 | 0 | | 0.9 | FLOOD RIS | К* |
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| Camden Mill | |
| Lower Bristol Road | |
| Bath | Mirro |
| Date 21/02/2022 09:41 | Designed by Stefan Gandler |
| File NLGEP Stormwater Model | Checked by |
| Innovyze | Network 2020.1.3 |
| <u>100 year Return Period Summary</u> <u>1) :</u> | of Critical Results by Maximum Level (Rank for Catchment 5 |
| Areal Reduction Factor 1 Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) 0 Foul Sewage per hectare (1/s) 0 | <pre>Mlation Criteria .000 Additional Flow - % of Total Flow 0.000 0 MADD Factor * 10m³/ha Storage 2.000 0 Inlet Coefficcient 0.800 0.500 Flow per Person per Day (1/per/day) 0.000 0.000</pre> |
| Number of Input Hydrogra Number of Online Contr Number of Offline Contr | aphs 0 Number of Storage Structures 1 rols 1 Number of Time/Area Diagrams 0 rols 0 Number of Real Time Controls 0 |
| Synthe | tic Rainfall Details |
| Rainfall Mode | 1 FEH |
| Site Location | n GB 486200 413400 SE 86200 13400 |
| C (1km) | -0.025 |
| D1 (1km) | 0.330 |
| D2 (1Km) |) 0.312 |
| E (1km) | 0.300 |
| F (1km) |) 2.451 |
| Cv (Summer) |) 0.750 |
| CV (WINCEL |) 0.040 |
| Margin for Flood Risk Warn: | ing (mm) 300.0 |
| Analysis ' | Timestep 2.5 Second Increment (Extended) |
| DVI | D Status ON |
| Inertia | a Status ON |
| | |
| Profile(s) Duration(s) (mins) 1 Return Period(s) (years) Climate Change (%) | Summer and Winter 5, 30, 60, 120, 240, 360, 480, 960, 1440 1, 30, 100 0, 40, 40 |
| US/MH Return Clim PN Name Storm Period Char | Water Mate First (X) First (Y) First (Z) Overflow Level Ange Surcharge Flood Overflow Act. (m) |
| S1.000 S1 1440 Winter 100 + | 40% 2.269 |
| S1.001 S2 1440 Winter 100 + | 40% 2.269 |
| 51.002 55 1440 Winter 100 + | 40% 2.269 |
| | |
| Surcharged Flooded | Half Drain Pipe |
| PN Name (m) (m ³) Cap | p.(1/s)(mins)(1/s)StatusExceeded |
| | |
| S1.000 S1 -0.066 0.000 0. S1.001 S2 -0.066 0.000 0. | 00 12.9 FLOOD RISK* |
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| Camden | Mill | | | | | | | | |
| Lower B | risto | l Road | | | | | | | |
| Bath | | | | | | | | | Micco |
| Date 21 | /02/2 | 022 09:41 | | E | esigned | by Stefan | Gandl | er | |
| File NL | GEP St | tormwater | Model | lo | hecked b | v | | | Drainage |
| Innovvz | e | | | N | letwork 2 | 020.1.3 | | | |
| | | | | - | | | | | |
| 100 ye | ear Re | turn Peri | od Summ | ary o | f Critica | al Results | by M | aximum Le | evel (Rank |
| | | | | 1) fo | or Catchm | ent 5 | - | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | Surcharged | Flooded | | / 0 | Half Drain | Pipe | | • • • • • 1 |
| PN | Name | Deptn (m) | (m ³) | Flow Cap. | (1/s) | (mins) | $f_{1/s}$ | Status | Level |
| | manie | () | () | oup. | (1/0) | (| (2/0) | beacab | Intecded |
| S1.002 | S3 | -0.024 | 0.000 | 0.0 | 0 | | 1.0 | FLOOD RIS | K* |
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| Camde | n Mill | - | | | | | | | | | | | |
| Lower | Brist | ol Roa | ad | | | | | | | | | | |
| Bath | | | | | | | | | | | Mi | irm | |
| Date | 21/02/ | 2022 | 09 : 42 | | De | esigned by | / Stef | an Ga | andle | r | n | ainac | מו |
| File 1 | NLGEP | Storm | water | Model | Cł | necked by | | | | | Ы | מוו ומנ | |
| Innov | yze | | | | Ne | etwork 202 | 20.1.3 | | | | | | |
| | | | | | | | | | | | | | |
| | | STOR | RM SEW | ER DES | IGN by | the Modi | fied R | lation | nal M | lethoo | <u>1</u> | | |
| | | | | 1 | D ! | m.l.l. C. | | 1 | C | | | | |
| | | | Ne | twork | Design | Table to: | r Catc | hment | 5 6 | | | | |
| | | | | « – I | ndicates | s pipe capa | citv < | flow | | | | | |
| | | | | | | 1 1 1 - | 4 | | | | | | |
| DN | Tonatk | E-11 | Glama | T 3moo | | Page | 1- | _ | | | Section | on T urno | 7 |
| PN | (m) | (m) | (1:X) | (ha) | I.E. (mins) | Flow (1/s) | (mm) | п | SECT | (mm) | Sectio | оп туре | Desig |
| | (/ | 、 , | (, | () | (/ | | (, | | | (, | | | |
| S1.000 | 30.336 | 5 0.248 | 122.5 | 0.075 | 5.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | |
| S1.001 | 30.736 | 0.251 0.251 | 122.5 | 0.011 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 500 500 | 1: | 3 Swale | |
| S1.003 | 30.809 | 0.252 | 122.3 | 0.021 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | Ă |
| S1.004 | 24.723 | 8 0.198 | 124.9 | 0.032 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | ā |
| co 000 | 20 022 | | 200 0 | 0 0 0 0 | E 00 | 0.0 | | 0 0 2 5 | 2 \ | | - | 2 0 1 | |
| 52.000 S2 001 | 32.933 | 5 0.165 | ∠00.0 200.2 | 0.034 | 5.00 | 0.0 | | 0.035 | 3 \=/ | 500 500 | ⊥: 1• | 3 Swale | |
| S2.001 | 76.607 | 0.383 | 200.2 | 0.052 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | Ä |
| s2.003 | 21.225 | 0.106 | 200.2 | 0.055 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 300 | 1: | 3 Swale | ă |
| S2.004 | 25.918 | 8 0.130 | 199.4 | 0.001 | 0.00 | 0.0 | 0.600 | | c | o 300 | Pipe/0 | Conduit | ē |
| S2.005 | 32.342 | 2 0.162 | 199.6 | 0.037 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 500 | 1: | 3 Swale | ê |
| \$2.006 | 18.186 | 0.091 | 199.8 | 0.009 | 0.00 | 0.0 | 0.600 | | C | 5 300 | Pipe/0 | Conduit | Ö |
| s1.005 | 36.845 | 5 0.184 | 200.2 | 0.006 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | 8 |
| S1.006 | 61.433 | 8 0.307 | 200.1 | 0.025 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 500 | 1: | 3 Swale | ē |
| S1.007 | 61.302 | 2 0.307 | 199.7 | 0.028 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 | 1: | 3 Swale | 8 |
| SI.008 | 61.644 | 0.308 0.307 | 200.1 199 8 | 0.030 | 0.00 | 0.0 | | 0.035 | 3 \=/ | / 500 / 500 | 1. | 3 Swale | |
| 01.000 | 01.011 | | 100.0 | 0.000 | 0.00 | 0.0 | | | 0 () | 000 | | 0 0 | |
| | | | | <u>]</u> | Network | Results | Table | | | | | | |
| | DN | Rain | ΨC | 115/TT. | E T Ares | S Base | Foul | ۵dd | Flow | Vel | Can | Flow | |
| | (1 | mm/hr) | (mins) | (m) | (ha) | Flow (1/s) |) (1/s) | (1, | /s) | (m/s) | (1/s) | (1/s) | |
| S1 | | 50 00 | 5 92 | 3 500 | 0 075 | 5 0 1 | 0 0 0 |) | 0 0 | 0 55 | 784 | 10 1 | |
| S1 S1 | L.001 | 50.00 | 6.85 | 3.252 | 0.085 | 5 0.1 | 0 0.0 |) | 0.0 | 0.55 | 78.4 | 11.5 | |
| S1 | L.002 | 50.00 | 7.78 | 3.001 | 0.101 | 0. | 0 0.0 |) | 0.0 | 0.55 | 78.4 | 13.7 | |
| S1 | L.003 | 50.00 | 8.71 | 2.750 | 0.122 | 0. | 0.0 |) | 0.0 | 0.55 | 78.5 | 16.6 | |
| S1 | L.004 | 50.00 | 9.47 | 2.498 | 0.154 | 0. | 0 0.0 |) | 0.0 | 0.54 | 77.6 | 20.8 | |
| S2 | 2.000 | 50.00 | 6.27 | 3.500 | 0.034 | 0. | 0 0.0 |) | 0.0 | 0.43 | 61.3 | 4.6 | |
| S2 S2 | 2.001 | 50.00 | 7.54 | 3.335 | 0.060 | 0.0 | 0 0.0 |) | 0.0 | 0.43 | 61.3 | 8.1 | |
| S2 | 2.002 | 50.00 | 10.50 | 3.172 | 0.111 | 0. | 0 0.0 |) | 0.0 | 0.43 | 61.3 | 15.1 | |
| S2 | 2.003 | 50.00 | 11.38 | 2.789 | 0.166 | 0.0 | 0.0 |) | 0.0 | 0.41 | 45.7 | 22.5 | |
| S2 | 2.004 | 50.00 | 13 00 | 2.683 | 0.168 | 0.0 | |) | 0.0 | 1.11 | /8.5 | 22.7 | |
| 52 S2 | 2.005 | 50.00 | 13.29 | 2.333 | 0.205 | 0.0 | 0 0.0 | ,) | 0.0 | 1.11 | 78.4 | 27.0 28.9 | |
| 52 | | | / | | | 5. | | | | | | | |
| S1 | L.005 | 50.00 | 14.72 | 2.300 | 0.373 | 0. | 0 0.0 |) | 0.0 | 0.43 | 61.3 | 50.6 | |
| S1 | L.006 | 50.00 | 17.10 | 2.116 | 0.398 | 0.0 | 0.0 |) | 0.0 | 0.43 | 61.3 | 53.9 | |
| S1 | L.UU'/ | 50.00 | 19.47 | 1.809 | 0.427 | 0.1 | U 0.0 |) | 0.0 | 0.43 | 61.4 | 57.8 | |
| S1 S1 | L.008 | 50.00 | ∠⊥.85 24.23 | 1.194 | 0.430 |) 0.1 | 0.0 | ,) | 0.0 | 0.43 | 61.4« | 66.2 | |
| | | | | | | | 0.0 | | | | | | |
| | | | | | @1982- | 2020 Tnno | WW70 | | | | | | |
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| uroHa | appolo | d Ltd | | | | | | | | | Pa | ge 2 | |
|------------|--------|---------------|--------|--------|----------|------------|---------|-------|-------|--------|-------|-------------|-------|
| amder | n Mill | 1 | | | | | | | | | | | |
| ower | Brist | col Roa | ad | | | | | | | | | | |
| ath | | | | | | | | | | | N | icco | |
| ate 2 | 21/02/ | /2022 (| 09:42 | | D | esigned b | / Stefa | an Ga | indle | er | | | |
| ile 1 | NLGEP | Storm | water | Model | c | hecked by | | | | | | المال المال | e |
| nnovy | yze | | | | N | etwork 202 | 20.1.3 | | | | | | |
| | - | | | | | | | | | | | | |
| | | STOP | RM SEW | ER DES | IGN by | the Modi | fied R | atior | nal M | letho | d | | |
| | | | | | | | | | | | | | |
| | | | Ne | twork | Design | Table fo | r Catc | hment | 5 6 | | | | |
| PN | Lengtl | h Fall | Slope | I.Area | T.E. | Base | k | n | HYD | DIA | Secti | on Type | Auto |
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow (l/s) | (mm) | | SECT | [(mm) | | | Desig |
| 1 010 | 51 1/1 | 6 0 256 | 199 8 | 0 029 | 0 00 | 0 0 | | 0 035 | 3 \- | / 600 | 1. | 3 Swale | ٩ |
| 1.010 | 51.14 | 0 0.250 | 199.0 | 0.029 | 0.00 | 0.0 | · | 0.000 | 5 (| , | · · | 5 Sware | |
| 3.000 | 39.412 | 2 0.252 | 156.3 | 0.025 | 5.00 | 0.0 | (| 0.035 | 3 \= | / 500 | 1: | 3 Swale | 8 |
| 3.001 | 71.591 | 1 0.458 | 156.3 | 0.035 | 0.00 | 0.0 | (| 0.035 | 3 \= | / 500 | 1: | 3 Swale | ē |
| 3.002 | 71.633 | 3 0.458 | 156.4 | 0.046 | 0.00 | 0.0 | (| 0.035 | 3 \= | / 500 | 1: | 3 Swale | ē |
| 3.003 | 71.602 | 2 0.458 | 156.3 | 0.058 | 0.00 | 0.0 | (| 0.035 | 3 \= | / 500 | 1: | 3 Swale | ē |
| 3.004 | 61.444 | 4 0.393 | 156.3 | 0.053 | 0.00 | 0.0 | (| 0.035 | 3 \= | / 600 | 1: | 3 Swale | |
| 3.005 | 15.682 | 2 0.100 | 156.8 | 0.061 | 0.00 | 0.0 | 0.600 | | | o 400 | Pipe/ | Conduit | ē |
| 1 011 | 16 510 | 0 0 0 0 0 0 0 | 100 0 | 0 000 | 0 00 | 0.0 | | 0 025 | 2 _ | 1 | 1. | 2 Com 1 c | |
| 1 012 | 10.010 | 0 0.003 | 199.0 | 0.023 | 0.00 | 0.0 | | 0.035 | 2 _ | | 1. | 2 Swale | |
| 1.012 | 14.326 | 6 0.072 | 199.0 | 0.000 | 0.00 | 0.0 | | 0.035 | 3 \= | / 500 | 1: | 3 Swale | Å |
| | | | | | | | | | | , | | | |
| | | | | 1 | Networ} | Results | Table | | | | | | |
| | PN | Rain | T.C. | US/IL | Σ I.Area | a Σ Base | Foul | Add | Flow | Vel | Cap | Flow | |
| | (| mm/hr) | (mins) | (m) | (ha) | Flow (l/s |) (l/s) | (1/ | 's) | (m/s) | (l/s) | (l/s) | |
| S1 | .010 | 50.00 | 26.16 | 0.887 | 0.51 | 9 0. | 0.0 | | 0.0 | 0.44 | 69.4« | 70.2 | |
| S3 | .000 | 50.00 | 6.35 | 2.750 | 0.02 | 5 0. | 0.0 | | 0.0 | 0.49 | 69.4 | 3.3 | |
| S3 | .001 | 50.00 | 8.80 | 2.498 | 0.06 | ο ο. | 0.0 | | 0.0 | 0.49 | 69.4 | 8.1 | |
| S3 | .002 | 50.00 | 11.25 | 2.040 | 0.10 | 60. | 0.0 | | 0.0 | 0.49 | 69.4 | 14.4 | |
| S3 | .003 | 50.00 | 13.70 | 1.582 | 0.16 | 50. | 0.0 | | 0.0 | 0.49 | 69.4 | 22.3 | |
| S3 | .004 | 50.00 | 15.76 | 1.124 | 0.21 | 7 0. | 0.0 | | 0.0 | 0.50 | 78.4 | 29.4 | |
| S3 | .005 | 50.00 | 15.93 | 0.731 | 0.27 | в О. | 0.0 | | 0.0 | 1.50 | 189.1 | 37.7 | |
| <u>S</u> 1 | .011 | 50 00 | 26 79 | 0.631 | 0 821 | 0 0 | 0 0 0 | | 0.0 | 0.44 | 69.54 | 111 0 | |
| S1 | .012 | 50 00 | 26 91 | 0.548 | 0 821 | 0. 0 0. | 0 0 0 | | 0.0 | 1.29 | 203 1 | 111 0 | |
| S1 | .013 | 50 00 | 27 47 | 0.133 | 0 89 | 5 0. | 0 0 0 | | 0.0 | 0.43 | 61.5« | 121 1 | |
| | | | | | | | | | | | . = | | |

| BuroHappold 3 | Ltd | | | | | Page 3 |
|---------------|-------------------|------------|----------|-----------|-----------|------------|
| Camden Mill | | | | | | |
| Lower Bristo | l Road | | | | | |
| Bath | | | | | | |
| Data 01/02/2 | 000.00.40 | Deelan | 1 l | 0+ | Condlan | — MICro |
| Date 21/02/2 | JZZ U9:4Z | Design | ea bi | y Steran | Gandler | Drainage |
| File NLGEP S | tormwater Model . | Checke | d by | | | |
| Innovyze | | Networ | k 20 | 20.1.3 | | |
| | | | | | | |
| | Area | Summary fo | r Ca | tchment (| 5 | |
| | | | | | | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total |
| Number | Туре | Name | (응) | Area (ha) | Area (ha) | (ha) |
| 1.000 | Classification | Road | 75 | 0.093 | 0.070 | 0.070 |
| 1.000 | Classification | Grass | 30 | 0.017 | 0.005 | 0.075 |
| 1.001 | Classification | Road | 75 | 0.008 | 0.006 | 0.006 |
| | Classification | Grass | 30 | 0.017 | 0.005 | 0.011 |
| 1.002 | Classification | Road | 75 | 0.014 | 0.011 | 0.011 |
| | Classification | Grass | 30 | 0.018 | 0.005 | 0.016 |
| 1.003 | Classification | Road | 75 | 0.021 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.019 | 0.006 | 0.021 |
| 1.004 | Classification | Road | /5 | 0.034 | 0.026 | 0.026 |
| 2 000 | Classification | Boad | 3U 75 | 0.020 | 0.006 | 0.032 |
| 2.000 | Classification | Grass | 30 | 0.022 | 0.001 | 0.017 |
| | Classification | Road | 75 | 0.013 | 0.010 | 0.027 |
| | Classification | Grass | 30 | 0.022 | 0.007 | 0.034 |
| 2.001 | Classification | Grass | 30 | 0.016 | 0.005 | 0.005 |
| | Classification | Road | 75 | 0.010 | 0.007 | 0.012 |
| | Classification | Road | 75 | 0.010 | 0.008 | 0.020 |
| | Classification | Grass | 30 | 0.020 | 0.006 | 0.026 |
| 2.002 | Classification | Road | 75 | 0.020 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.028 | 0.008 | 0.024 |
| | Classification | Boad | 30 75 | 0.003 | 0.001 | 0.025 |
| | Classification | Grass | 30 | 0.040 | 0.012 | 0.052 |
| 2.003 | Classification | Road | 75 | 0.018 | 0.013 | 0.013 |
| | Classification | Grass | 30 | 0.021 | 0.006 | 0.020 |
| | Classification | Road | 75 | 0.038 | 0.028 | 0.048 |
| | Classification | Grass | 30 | 0.023 | 0.007 | 0.055 |
| 2.004 | Classification | Grass | 30 | 0.004 | 0.001 | 0.001 |
| 2.005 | Classification | Road | 75 | 0.026 | 0.020 | 0.020 |
| | Classification | Road | 75 | 0.017 | 0.013 | 0.032 |
| 2 006 | Classification | Grass | 30 20 | 0.01/ | 0.005 | 0.037 |
| 1.005 | Classification | Grass | 30 | 0.019 | 0.006 | 0.006 |
| 1.006 | Classification | Road | 75 | 0.017 | 0.012 | 0.012 |
| | Classification | Grass | 30 | 0.041 | 0.012 | 0.025 |
| 1.007 | Classification | Road | 75 | 0.021 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.044 | 0.013 | 0.028 |
| 1.008 | Classification | Road | 75 | 0.020 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.050 | 0.015 | 0.030 |
| 1.009 | Classification | Road | /5 20 | 0.021 | 0.017 | 0.033 |
| 1 010 | Classification | Posd | 3U 75 | 0.038 | 0.015 | 0.033 |
| 1.010 | Classification | Grass | 30 | 0.020 | 0.015 | 0.029 |
| 3.000 | Classification | Road | 75 | 0.015 | 0.012 | 0.012 |
| | Classification | Grass | 30 | 0.024 | 0.007 | 0.019 |
| | Classification | Grass | 30 | 0.019 | 0.006 | 0.025 |
| 3.001 | Classification | Road | 75 | 0.014 | 0.011 | 0.011 |
| | Classification | Grass | 30 | 0.022 | 0.007 | 0.017 |
| | Classification | Road | 75 | 0.014 | 0.011 | 0.028 |
| 2 000 | Classification | Grass | 30 | 0.025 | 0.008 | 0.035 |
| 3.002 | CIASSILICATION | Koad | 15 | 0.019 | 0.014 | 0.014 |
| | | 01982-2020 | Inno | ovyze | | |

| BuroHappold I | Ltd | | | | | Page 4 |
|--|-----------------------|-------------|--------|-------------|-------------|---------------|
| Camden Mill | | | | | | |
| Lower Bristol | l Road | | | | | |
| Bath | | | | | | Micco |
| Date 21/02/20 | 022 09:42 | Design | ed by | y Stefan | Gandler | Desinado |
| File NLGEP St | cormwater Model | Checke | ed by | | | Drainacje |
| Innovyze | | Networ | k 202 | 20.1.3 | | |
| | | | | | | |
| | Area S | Summary fo | or Ca | tchment (| 5 | |
| | | | | | _ | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) |
| | Classification | Grass | 30 | 0.028 | 0.008 | 0.023 |
| | Classification | Road | 75 | 0.018 | 0.013 | 0.036 |
| | Classification | Grass | 30 | 0.036 | 0.011 | 0.046 |
| 3.003 | Classification | Road | 75 | 0.022 | 0.017 | 0.017 |
| | Classification | Grass | 30 | 0.035 | 0.010 | 0.027 |
| | Classification | Road | 75 | 0.021 | 0.016 | 0.043 |
| | Classification | Grass | 30 | 0.051 | 0.015 | 0.058 |
| 3.004 | Classification | Road | 75 | 0.020 | 0.015 | 0.015 |
| | Classification | Grass | 30 | 0.030 | 0.009 | 0.024 |
| | Classification | Road | 75 | 0.018 | 0.013 | 0.037 |
| 2.005 | Classification | Grass | 30 | 0.052 | 0.015 | 0.053 |
| 3.005 | Classification | Road | 75 | 0.022 | 0.017 | 0.01/ |
| | Classification | Road | 20 | 0.024 | 0.018 | 0.034 |
| | Classification | GLASS | 30 | 0.030 | 0.011 | 0.045 |
| 1 011 | Classification | Road | 75 | 0.032 | 0.010 | 0.001 |
| 1.011 | Classification | Grass | 30 | 0.018 | 0.005 | 0.023 |
| 1.012 | - | - | 100 | 0.000 | 0.000 | 0.000 |
| 1.013 | Classification Deter | ntion Basin | 100 | 0.058 | 0.058 | 0.058 |
| | Classification | Grass | 30 | 0.057 | 0.017 | 0.075 |
| | | | | Total | Total | Total |
| | | | | 1.822 | 0.895 | 0.895 |
| | | | | | | |
| | Simulatio | n Criteri | a for | Catchme | nt 6 | |
| | | | | | | |
| Vo | olumetric Runoff Coef | f 0.750 | Additi | ional Flow | - % of Tot | al Flow 0.000 |
| 1 | Areal Reduction Facto | or 1.000 | MZ | ADD Factor | * 10m³/ha | Storage 2.000 |
| | Hot Start (mins | ;) 0 | | - | Inlet Coeff | iecient 0.800 |
| Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000 | | | | | | |
| Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 60 | | | | | | |
| rour sev | wage per nectare (1/5 | 3) 0.000 | | oucpt | it interval | |
| | Number of Input Hydro | ographs 0 N | lumber | of Storag | e Structure | es 1 |
| | Number of Online C | ontrols 1 M | Jumber | of Time/A | rea Diagram | ms O |
| | Number of Offline C | ontrols 0 M | Jumber | of Real T | ime Control | ls O |
| | | | | | | |
| | Synth | netic Rair | nfall | Details | | |
| | | | | | | |
| | Rainfall N | lodel | | | FEH | I |
| | Return Period (ye | ears) | | | 100 |) |
| | rsion | | | 1999 |) | |
| Site Location (| | | 6200 4 | 413400 SE 8 | 36200 13400 |) |
| C (1km | | (1km) | | | -0.025 | |
| | Dl | (1km) | | | 0.330 | 1 |
| | D2 | (1km) | | | 0.312 | |
| | D3 | (1km) | | | 0.298 | 1 |
| | E | (1km) | | | 0.300 |) |
| | F · | (⊥KM) | | | 2.451 | |
| Summer Storms Ies | | | | | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

Synthetic Rainfall Details

| Winter Storms | Yes |
|-----------------------|-------|
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

| BuroHappold Ltd | | Page 6 | | | | |
|--|--|--------|--|--|--|--|
| Camden Mill | | | | | | |
| Lower Bristol Road | | | | | | |
| Bath | | Micco | | | | |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | | | | | |
| File NLGEP Stormwater Model | Checked by | nginga | | | | |
| Innovyze | Network 2020.1.3 | | | | | |
| Orifice Manhole: S6, DS/PN: S1.013, Volume (m ³): 62.4 | | | | | | |
| Orifice Manhole: S6, Diameter (m) 0.034 Discharge | DS/PN: S1.013, Volume (m ³): 62.4 e Coefficient 0.600 Invert Level (m) 0. | 133 | | | | |
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| Г | | | | | | | | | | | |
|--|---|----------|--|--|--|--|--|--|--|--|--|
| BuroHappold Ltd | | Page 7 | | | | | | | | | |
| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | Micco | | | | | | | | | |
| Date 21/02/2022 09:42 De | esigned by Stefan Gandler | | | | | | | | | | |
| File NLGEP Stormwater Model (Ch | ecked by | Drainage | | | | | | | | | |
| | | | | | | | | | | | |
| Innovyze Ne | etwork 2020.1.5 | | | | | | | | | | |
| | | | | | | | | | | | |
| Storage Struct | tures for Catchment 6 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Infiltration Basin | Manhole: S6, DS/PN: S1.013 | | | | | | | | | | |
| | | | | | | | | | | | |
| Invert 1 | Level (m) 0.133 Safety Factor 2.0 | | | | | | | | | | |
| Infiltration Coefficient Sid | $\frac{de(m/hr)}{de(m/hr)} = 0.00000 \qquad POROSILY 1.00$ | | | | | | | | | | |
| | | | | | | | | | | | |
| Depth (m) Area (m ²) Depth | (m) Area (m ²) Depth (m) Area (m ²) | | | | | | | | | | |
| | | | | | | | | | | | |
| 0.000 262.3 0. | .350 336.1 1.300 582.6 | | | | | | | | | | |
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|--|---|-------------|--|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | |
| Bath | | Micro | | | | | | | | |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamage | | | | | | | | |
| Innovyze Network 2020.1.3 | | | | | | | | | | |
| | | | | | | | | | | |
| 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) | | | | | | | | | | |
| for Catchment 6 | | | | | | | | | | |
| | | | | | | | | | | |
| Si | mulation Criteria | | | | | | | | | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Flo | ow 0.000 wc | | | | | | | | |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 | | | | | | | | |
| Hot Start Level (mm) | 0 Inlet Coefficien | nt 0.800 | | | | | | | | |
| Foul Sewage per hectare (1/s) | 0.000 Flow per Person per Day (1/per/day | y) 0.000 | | | | | | | | |
| | | | | | | | | | | |
| Number of Input Hydrogi | caphs 0 Number of Storage Structures 1 | | | | | | | | | |
| Number of Online Cont | crols 1 Number of Time/Area Diagrams 0 | | | | | | | | | |
| | TOTS O NUMBER OF Real TIME CONCLOSS O | | | | | | | | | |
| Synthe | etic Rainfall Details | | | | | | | | | |
| Rainfall Mode | el FEH | | | | | | | | | |
| FEH Rainfall Versio | on 1999 on GB 486200 413400 SE 86200 13400 | | | | | | | | | |
| C (1kr | n) -0.025 | | | | | | | | | |
| D1 (1kr | n) 0.330 | | | | | | | | | |
| D2 (1kr | n) 0.312 | | | | | | | | | |
| D3 (1kr | n) 0.298 | | | | | | | | | |
| E (Iki | n) 0.300 | | | | | | | | | |
| Cy (Summe | r) 0.750 | | | | | | | | | |
| Cv (Winte: | c) 0.840 | | | | | | | | | |
| | | | | | | | | | | |
| Margin for Flood Risk Warn | ning (mm) 300. Timester 2 5 Second Ingrement (Extended | 0 | | | | | | | | |
| Anarysis D' | TIMestep 2.5 second increment (Extended IS Status OF | 'F' | | | | | | | | |
| D7 | /D Status C | N N | | | | | | | | |
| Inert | ia Status C | N | | | | | | | | |
| | | | | | | | | | | |
| Profile(s) | Summer and Winte | r | | | | | | | | |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 0 | | | | | | | | |
| Return Period(s) (years) | 1, 30, 10 | 0 | | | | | | | | |
| Climate Change (%) | 0,40,4 | 0 | | | | | | | | |
| | | | | | | | | | | |
| | | Water | | | | | | | | |
| US/MH Return Climat | e First (X) First (Y) First (Z) Ove | rflow Level | | | | | | | | |
| PN Name Storm Period Change | e Surcharge Flood Overflow A | .ct. (m) | | | | | | | | |
| S1.000 S1 15 Winter 1 +0 | 8 | 3.549 | | | | | | | | |
| S1.001 S2 15 Winter 1 +0 | 8 | 3.304 | | | | | | | | |
| S1.002 S2 15 Winter 1 +0 | 8 | 3.057 | | | | | | | | |
| S1.003 S4 15 Winter 1 +0 | े २ | 2.810 | | | | | | | | |
| S2.000 S2 15 Winter 1 +0 | ० १ | 3.537 | | | | | | | | |
| S2.001 S7 15 Winter 1 +0 | 8 | 3.383 | | | | | | | | |
| S2.002 S7 15 Winter 1 +0 | 8 | 3.235 | | | | | | | | |
| S2.003 S7 15 Winter 1 +0 | 8 | 2.879 | | | | | | | | |
| S2.004 S10 15 Winter 1 +0 | % 100/15 Summer | 2.775 | | | | | | | | |
| 52.003 59 15 WINLER I +0 | ° | 2.034 | | | | | | | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 6</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.000 | S1 | -0.351 | 0.000 | 0.01 | | | 9.7 | OK | |
| S1.001 | S2 | -0.448 | 0.000 | 0.01 | | | 10.7 | OK | |
| S1.002 | S2 | -0.444 | 0.000 | 0.01 | | | 12.4 | OK | |
| S1.003 | S4 | -0.440 | 0.000 | 0.01 | | | 14.2 | OK | |
| S1.004 | S2 | -0.433 | 0.000 | 0.02 | | | 17.2 | OK | |
| S2.000 | S2 | -0.363 | 0.000 | 0.01 | | | 4.4 | OK | |
| S2.001 | S7 | -0.452 | 0.000 | 0.01 | | | 7.0 | OK | |
| S2.002 | S7 | -0.437 | 0.000 | 0.01 | | | 11.4 | OK | |
| S2.003 | S7 | -0.410 | 0.000 | 0.02 | | | 16.1 | OK | |
| S2.004 | S10 | -0.208 | 0.000 | 0.21 | | | 16.2 | OK* | |
| S2.005 | S9 | -0.419 | 0.000 | 0.02 | | | 19.1 | OK | |

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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 6</u>

| | | | | | | | | | | | | | Water |
|--------|-------|------|--------|--------|---------|--------|--------|-------|-----|-------|-----|----------|-------|
| | US/MH | | | Return | Climate | First | : (X) | First | (Y) | First | (Z) | Overflow | Level |
| PN | Name | S | torm | Period | Change | Surch | narge | Flo | od | Overf | low | Act. | (m) |
| 52.006 | S10 | 15 | Winter | 1 | +0% | 100/15 | Summer | | | | | | 2,494 |
| S1.005 | S6 | 15 | Winter | 1 | +0% | , | | | | | | | 2.413 |
| S1.006 | S4 | 15 | Winter | 1 | +0% | | | | | | | | 2.230 |
| S1.007 | S2 | 15 | Winter | 1 | +0읭 | | | | | | | | 1.922 |
| S1.008 | S6 | 15 | Winter | 1 | +0% | | | | | | | | 1.615 |
| S1.009 | S3 | 15 | Winter | 1 | +0% | | | | | | | | 1.306 |
| S1.010 | S8 | 30 | Winter | 1 | +0% | | | | | | | | 0.988 |
| S3.000 | S15 | 15 | Winter | 1 | +0% | | | | | | | | 2.779 |
| S3.001 | S4 | 15 | Winter | 1 | +0% | | | | | | | | 2.543 |
| S3.002 | S11 | 15 | Winter | 1 | +0% | | | | | | | | 2.098 |
| S3.003 | S6 | 15 | Winter | 1 | +0% | | | | | | | | 1.651 |
| S3.004 | S13 | 15 | Winter | 1 | +0% | | | | | | | | 1.195 |
| S3.005 | S3 | 15 | Winter | 1 | +0% | 30/360 | Winter | | | | | | 0.842 |
| S1.011 | S2 | 30 | Winter | 1 | +0% | | | | | | | | 0.756 |
| S1.012 | S5 | 1440 | Winter | 1 | +0% | | | | | | | | 0.661 |
| S1.013 | S6 | 1440 | Winter | 1 | +0% | | | | | | | | 0.661 |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|--------|-------|------------|---------|--------|----------|------------|-------|--------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (1/s) | (mins) | (l/s) | Status | Exceeded |
| S2.006 | S10 | -0.197 | 0.000 | 0.26 | | | 19.5 | OK* | |
| S1.005 | S6 | -0.387 | 0.000 | 0.04 | | | 35.4 | OK | |
| S1.006 | S4 | -0.386 | 0.000 | 0.04 | | | 35.4 | OK | |
| S1.007 | S2 | -0.387 | 0.000 | 0.04 | | | 35.4 | OK | |
| S1.008 | S6 | -0.387 | 0.000 | 0.04 | | | 34.8 | OK | |
| S1.009 | S3 | -0.388 | 0.000 | 0.04 | | | 34.4 | OK | |
| S1.010 | S8 | -0.599 | 0.000 | 0.02 | | | 34.3 | OK | |
| S3.000 | S15 | -0.471 | 0.000 | 0.00 | | | 3.3 | OK | |
| S3.001 | S4 | -0.455 | 0.000 | 0.01 | | | 6.8 | OK | |
| S3.002 | S11 | -0.442 | 0.000 | 0.01 | | | 11.0 | OK | |
| S3.003 | S6 | -0.431 | 0.000 | 0.02 | | | 15.7 | OK | |
| S3.004 | S13 | -0.529 | 0.000 | 0.01 | | | 19.7 | OK | |
| S3.005 | S3 | -0.289 | 0.000 | 0.17 | | | 24.2 | OK* | |
| S1.011 | S2 | -1.863 | 0.000 | 0.00 | | | 49.9 | OK | |
| S1.012 | S5 | -1.257 | 0.000 | 0.00 | | | 6.6 | OK | |
| S1.013 | S6 | -0.772 | 0.000 | 0.00 | | 1290 | 1.6 | OK | |

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|---|----------------------|
| Camden Mill | |
| Lower Bristol Road | |
| Bath | Micco |
| Date 21/02/2022 09:42 Designed by Stefan Gandler | |
| File NLGEP Stormwater Model Checked by | Drainage |
| Innovyze Network 2020.1.3 | |
| | |
| 30 vear Return Period Summary of Critical Results by Maximum Lev | el (Rank 1) |
| for Catchment 6 | |
| | |
| | |
| Simulation Criteria | |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) U MADD Factor * 10m³/ha Stora Hot Start Level (mm) 0 | ge 2.000 nt 0.800 |
| Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/da | v) 0.000 |
| Foul Sewage per hectare (1/s) 0.000 | |
| | |
| Number of Input Hydrographs 0 Number of Storage Structures 1 | |
| Number of Offline Controls () Number of Real Time Controls () | |
| | |
| Synthetic Rainfall Details | |
| Rainfall Model FEH | |
| FEH Rainfall Version 1999 Site Leastion CP 486200 413400 SF 86200 13400 | |
| $C_{\rm c} (1 \text{ km}) = -0.025$ | |
| D1 (1km) 0.330 | |
| D2 (1km) 0.312 | |
| D3 (1km) 0.298 | |
| E (1km) 0.300 | |
| F (1km) 2.451 | |
| CV (Summer) 0.750 | |
| | |
| Margin for Flood Risk Warning (mm) 300. | 0 |
| Analysis Timestep 2.5 Second Increment (Extended | 1) |
| DTS Status OF | 'F |
| DVD Status Inertia Status |)N |
| | , iv |
| | |
| Profile(s) Summer and Winter | er |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 144 Return Period(s) (years) | 10 |
| Climate Change (%) 0, 40, 4 | 10 |
| | |
| | C 11 |
| WARNING: Hall Drain lime has not been calculated as the structure is to | o IUII. |
| | |
| | Water |
| US/MH Return Climate First (X) First (Y) First (Z) Overf | low Level |
| PN Name Storm Period Change Surcharge Flood Overflow Act | (m) |
| S1.000 S1 15 Winter 30 +40% | 3.610 |
| S1.001 S2 15 Winter 30 +40% | 3.368 |
| S1.002 S2 15 Winter 30 +40% | 3.126 |
| S1.003 S4 15 Winter 30 +40% | 2.885 |
| S1.004 S2 15 Winter 30 +40% | 2.649 |
| S2.000 S2 15 Winter 30 +40% | 3.583 |
| 52.001 S7 15 Winter 30 +40% S2.002 S7 15 Winter 30 +40% | 3.445 3.320 |
| | 5.520 |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.290 | 0.000 | 0.06 | | | 41.9 | FLOOD RISK* | |
| S1.001 | S2 | -0.384 | 0.000 | 0.04 | | | 47.4 | OK | |
| S1.002 | S2 | -0.375 | 0.000 | 0.05 | | | 54.8 | OK | |
| S1.003 | S4 | -0.365 | 0.000 | 0.06 | | | 63.9 | OK | |
| S1.004 | S2 | -0.349 | 0.000 | 0.07 | | | 76.8 | OK | |
| S2.000 | S2 | -0.317 | 0.000 | 0.04 | | | 18.9 | OK | |
| S2.001 | S7 | -0.390 | 0.000 | 0.04 | | | 32.9 | OK | |
| S2.002 | S7 | -0.352 | 0.000 | 0.06 | | | 55.1 | OK | |

| BuroHappold Ltd | | Page 13 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| | | | | | | | | | | | | | Water |
|--------|-------|-------|--------|--------|---------|--------|--------|-------|-----|----------|-----|----------|-------|
| | US/MH | | | Return | Climate | First | t (X) | First | (Y) | First | (Z) | Overflow | Level |
| PN | Name | Storm | | Period | Change | Surcl | harge | Flood | | Overflow | | Act. | (m) |
| 52.003 | S7 | 15 | Winter | 30 | +40% | | | | | | | | 2,981 |
| s2.004 | S10 | 15 | Winter | 30 | +40% | 100/15 | Summer | | | | | | 2.917 |
| s2.005 | S9 | 15 | Winter | 30 | +40% | | | | | | | | 2.735 |
| S2.006 | S10 | 15 | Winter | 30 | +40% | 100/15 | Summer | | | | | | 2.662 |
| S1.005 | S6 | 15 | Winter | 30 | +40% | | | | | | | | 2.530 |
| S1.006 | S4 | 15 | Winter | 30 | +40% | | | | | | | | 2.347 |
| S1.007 | S2 | 15 | Winter | 30 | +40% | | | | | | | | 2.037 |
| S1.008 | S6 | 15 | Winter | 30 | +40% | | | | | | | | 1.728 |
| S1.009 | S3 | 15 | Winter | 30 | +40% | | | | | | | | 1.417 |
| S1.010 | S8 | 1440 | Winter | 30 | +40% | | | | | | | | 1.254 |
| S3.000 | S15 | 15 | Winter | 30 | +40% | | | | | | | | 2.814 |
| S3.001 | S4 | 15 | Winter | 30 | +40% | | | | | | | | 2.604 |
| S3.002 | S11 | 15 | Winter | 30 | +40% | | | | | | | | 2.175 |
| S3.003 | S6 | 15 | Winter | 30 | +40% | | | | | | | | 1.744 |
| S3.004 | S13 | 15 | Winter | 30 | +40% | | | | | | | | 1.291 |
| S3.005 | S3 | 1440 | Winter | 30 | +40% | 30/360 | Winter | | | | | | 1.254 |
| S1.011 | S2 | 1440 | Winter | 30 | +40% | | | | | | | | 1.254 |
| S1.012 | S5 | 1440 | Winter | 30 | +40% | | | | | | | | 1.254 |
| S1.013 | S6 | 1440 | Winter | 30 | +40% | | | | | | | | 1.254 |
| | | | | | | | | | | | | | |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|--------|-------|------------|---------|--------|----------|------------|-------|-------------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (l/s) | Status | Exceeded |
| S2.003 | S7 | -0.308 | 0.000 | 0.10 | | | 77.2 | OK | |
| S2.004 | S10 | -0.066 | 0.000 | 0.96 | | | 75.3 | OK* | |
| S2.005 | S9 | -0.318 | 0.000 | 0.10 | | | 85.3 | OK | |
| S2.006 | S10 | -0.029 | 0.000 | 1.00 | | | 75.6 | OK* | |
| S1.005 | S6 | -0.270 | 0.000 | 0.17 | | | 148.3 | FLOOD RISK* | |
| S1.006 | S4 | -0.269 | 0.000 | 0.17 | | | 146.6 | FLOOD RISK* | |
| S1.007 | S2 | -0.272 | 0.000 | 0.17 | | | 145.2 | FLOOD RISK* | |
| S1.008 | S6 | -0.274 | 0.000 | 0.17 | | | 142.5 | FLOOD RISK* | |
| S1.009 | S3 | -0.277 | 0.000 | 0.16 | | | 139.3 | FLOOD RISK* | |
| S1.010 | S8 | -0.333 | 0.000 | 0.01 | | | 12.2 | OK | |
| S3.000 | S15 | -0.436 | 0.000 | 0.01 | | | 13.8 | OK | |
| S3.001 | S4 | -0.394 | 0.000 | 0.03 | | | 32.2 | OK | |
| S3.002 | S11 | -0.365 | 0.000 | 0.06 | | | 53.5 | OK | |
| S3.003 | S6 | -0.338 | 0.000 | 0.08 | | | 76.1 | OK | |
| S3.004 | S13 | -0.433 | 0.000 | 0.06 | | | 94.4 | OK | |
| S3.005 | S3 | 0.123 | 0.000 | 0.04 | | | 5.8 | SURCHARGED* | |
| S1.011 | S2 | -1.365 | 0.000 | 0.00 | | | 16.7 | OK | |
| S1.012 | S5 | -0.664 | 0.000 | 0.00 | | | 15.7 | OK | |
| S1.013 | S6 | -0.179 | 0.000 | 0.00 | | | 2.5 | FLOOD RISK* | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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|------------------|----------------------------|--|---------------------|--------------------------|------------------------------------|------------|
| Camden Mi | .11 | | | | | |
| Lower Bri | stol Road | | | | | |
| Bath | | | | | | Mirro |
| Date 21/0 | 02/2022 09:42 | 1 | Designed b | y Stefan | Gandler | Dcainago |
| File NLGE | CP Stormwater | Model | Checked by | | | Diamage |
| Innovyze | | | Network 20 | 20.1.3 | | |
| | | | | | | |
| <u>100 yea</u> : | r Return Per | iod Summary | of Critical | l Results | by Maximum I | evel (Rank |
| | | 1) | for Catchme | nt 6 | | |
| | | | | | | |
| | | Si | mulation Crite | eria | | |
| | Areal Redu | ction Factor | 1.000 Addit: | ional Flow | - % of Total Fl | ow 0.000 |
| | Hot | Start (mins) | 0 Mž | ADD Factor | * 10m ³ /ha Stora | ige 2.000 |
| Manho | Hot Star | t Level (mm) | 0 0 500 Flow por | I r Porson no | nlet Coeffiecie r Day (1/por/da | ent 0.800 |
| Fou | l Sewage per h | ectare (l/s) | 0.000 FIOW Pe. | r rerson pe | i Day (i/pei/da | ly) 0.000 |
| | - J- F 1 | - , -, -, | | | | |
| | Number of | Input Hydrogr | aphs 0 Number | of Storage | e Structures 1 | |
| | Number of | OI UNIINE Cont Offline Cont | rols () Number | or Time/Ar of Real Ti | ime Controls 0 | |
| | | | | 11 | | |
| | | Synthe | tic Rainfall | Details | | |
| | FFU D- | Rainfall Mode | 2 | | FEH 1000 | |
| | FER Ro | Site Locatio | on GB 486200 4 | 13400 SE 86 | 5200 13400 | |
| | | C (1km | 1) | | -0.025 | |
| | | D1 (1km | ı) | | 0.330 | |
| | | D2 (1km | 1) | | 0.312 | |
| | | D3 (lkm E (lkm | 1) | | 0.298 | |
| | | E (1Km F (1km | 1) 1) | | 2.451 | |
| | | Cv (Summer | ;) | | 0.750 | |
| | | Cv (Winter | .) | | 0.840 | |
| | Manada fan E | and Diah Warr | ing (mm) | | 300 | 0 |
| | Margin Ior F. | Analvsis | Timestep 2.5 | Second Incr | cement (Extende | .0 d) |
| | | DI | 'S Status | 2000114 11101 | 0 | FF |
| | | DV | D Status | | | ON |
| | | Inerti | a Status | | | ON |
| | | | | | | |
| | | Profile(s) | | S | Summer and Wint | er |
| | Duratio | on(s) (mins) 1 | 5, 30, 60, 12 | 20, 240, 360 |), 480, 960, 14 | 40 |
| | Return Period | i(s) (years) | | | 1, 30, 1 | 00 |
| | CIIIIace | e change (%) | | | 0,40, | 40 |
| | | | | | | |
| WARN | ING: Half Drain | n Time has not | : been calcula | ted as the | structure is to | oo full. |
| | | | | | | |
| | | | | | | Water |
| ' | US/MH | Return Clim | ate First (X) | First (Y) | First (Z) Over | flow Level |
| PN | Name Storm | Period Char | ige Surcharge | Flood | Overflow Ac | t. (m) |
| S1.000 | S1 15 Winte | r 100 + | 40% | | | 3.636 |
| S1.001 | S2 15 Winte | r 100 + | 40% | | | 3.396 |
| S1.002 | S2 15 Winter | r 100 + | 40% | | | 3.156 |
| S1.003 | S4 15 Winte: | r = 100 + 1000 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + | 40% 108 | | | 2.917 |
| S2.000 | S2 15 Winte S2 15 Winte | 100 + | | | | 2.001 |
| s2.001 | S7 15 Winter | r 100 + | 40% | | | 3.469 |
| S2.002 | S7 15 Winte | r 100 + | 40% | | | 3.352 |
| | | @1 93 | 32-2020 Inno | OVVZA | | |
| L | | ST) | TIII(| | | |

| BuroHappold Ltd | | Page 15 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.264 | 0.000 | 0.10 | | | 62.9 | FLOOD RISK* | |
| S1.001 | S2 | -0.356 | 0.000 | 0.07 | | | 71.3 | OK | |
| S1.002 | S2 | -0.345 | 0.000 | 0.08 | | | 82.1 | OK | |
| S1.003 | S4 | -0.333 | 0.000 | 0.09 | | | 96.2 | OK | |
| S1.004 | S2 | -0.317 | 0.000 | 0.11 | | | 115.8 | OK | |
| S2.000 | S2 | -0.298 | 0.000 | 0.06 | | | 28.4 | FLOOD RISK* | |
| S2.001 | S7 | -0.366 | 0.000 | 0.06 | | | 48.4 | OK | |
| S2.002 | S7 | -0.320 | 0.000 | 0.10 | | | 82.3 | OK | |

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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:42 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| | | | | | | | | | | | | | Water |
|---------|-------|------|--------|--------|---------|--------|--------|-------|-----|-------|-----|----------|-------|
| | US/MH | | | Return | Climate | First | : (X) | First | (Y) | First | (Z) | Overflow | Level |
| PN | Name | St | torm | Period | Change | Surch | narge | Floo | bd | Overf | low | Act. | (m) |
| \$2 003 | 57 | 15 | Winter | 100 | +40% | | | | | | | | 3 051 |
| S2.003 | S10 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | | 3.025 |
| S2.005 | S9 | 15 | Winter | 100 | +40% | , | | | | | | | 2.786 |
| S2.006 | S10 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | | 2.743 |
| S1.005 | S6 | 15 | Winter | 100 | +40% | | | | | | | | 2.564 |
| S1.006 | S4 | 15 | Winter | 100 | +40% | | | | | | | | 2.383 |
| S1.007 | S2 | 15 | Winter | 100 | +40% | | | | | | | | 2.075 |
| S1.008 | S6 | 15 | Winter | 100 | +40% | | | | | | | | 1.766 |
| S1.009 | S3 | 15 | Winter | 100 | +40% | | | | | | | | 1.455 |
| S1.010 | S8 | 1440 | Winter | 100 | +40% | | | | | | | | 1.421 |
| S3.000 | S15 | 15 | Winter | 100 | +40% | | | | | | | | 2.830 |
| S3.001 | S4 | 15 | Winter | 100 | +40% | | | | | | | | 2.627 |
| S3.002 | S11 | 15 | Winter | 100 | +40% | | | | | | | | 2.206 |
| S3.003 | S6 | 15 | Winter | 100 | +40% | | | | | | | | 1.780 |
| S3.004 | S13 | 1440 | Winter | 100 | +40% | | | | | | | | 1.421 |
| S3.005 | S3 | 1440 | Winter | 100 | +40% | 30/360 | Winter | | | | | | 1.421 |
| S1.011 | S2 | 1440 | Winter | 100 | +40% | | | | | | | | 1.421 |
| S1.012 | S5 | 1440 | Winter | 100 | +40% | | | | | | | | 1.421 |
| S1.013 | S6 | 1440 | Winter | 100 | +40% | | | | | | | | 1.421 |
| | | | | | | | | | | | | | |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|---------|-------|------------|---------|--------|----------|------------|-------|-------------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (l/s) | Status | Exceeded |
| S2.003 | S7 | -0.238 | 0.000 | 0.14 | | | 100.0 | FLOOD RISK* | |
| S2.004 | S10 | 0.042 | 0.000 | 1.20 | | | 93.9 | SURCHARGED* | |
| \$2.005 | 59 | -0.267 | 0.000 | 0.12 | | | 105.9 | FLOOD RISK* | |
| S2.006 | S10 | 0.052 | 0.000 | 1.32 | | | 99.5 | SURCHARGED* | |
| S1.005 | S6 | -0.236 | 0.000 | 0.24 | | | 200.7 | FLOOD RISK* | |
| S1.006 | S4 | -0.233 | 0.000 | 0.24 | | | 201.4 | FLOOD RISK* | |
| S1.007 | S2 | -0.234 | 0.000 | 0.24 | | | 200.3 | FLOOD RISK* | |
| S1.008 | S6 | -0.236 | 0.000 | 0.23 | | | 196.8 | FLOOD RISK* | |
| S1.009 | S3 | -0.239 | 0.000 | 0.23 | | | 193.5 | FLOOD RISK* | |
| S1.010 | S8 | -0.166 | 0.000 | 0.01 | | | 15.0 | FLOOD RISK* | |
| S3.000 | S15 | -0.420 | 0.000 | 0.02 | | | 20.7 | OK | |
| S3.001 | S4 | -0.371 | 0.000 | 0.05 | | | 47.6 | OK | |
| S3.002 | S11 | -0.334 | 0.000 | 0.08 | | | 79.6 | OK | |
| S3.003 | S6 | -0.302 | 0.000 | 0.12 | | | 114.2 | OK | |
| S3.004 | S13 | -0.303 | 0.000 | 0.00 | | | 6.7 | OK | |
| S3.005 | S3 | 0.290 | 0.000 | 0.06 | | | 8.5 | SURCHARGED* | |
| S1.011 | S2 | -1.198 | 0.000 | 0.00 | | | 19.6 | OK | |
| S1.012 | S5 | -0.497 | 0.000 | 0.00 | | | 18.0 | OK | |
| S1.013 | S6 | -0.012 | 0.000 | 0.00 | | | 2.6 | FLOOD RISK* | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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|----------|--------------|--------------------|--------------------|----------------|----------|------------|----------|----------|---------------------|---------------|----------------|----------------|-------|
| Camde | n Mill | 1 | | | | | | | | | | | |
| Lower | Brist | col Ro | ad | | | | | | | | ~ | | |
| Bath | | | | | | | | | | | Mi | | |
| Date | 21/02 | /2022 | 09:43 | | De | signed by | Stef | an Gand | ller | | | ιu | |
| Filo 1 | NI CED | Storm | wator | Model | Ch | ockod by | Deer | un ouno | LUL . | | Uſa | anaqu | 2 |
| File I | NLGEP | Storm | water | Model | | lecked by | | | | | | | |
| Innov | yze | | | | Ne | twork 202 | 0.1.3 | | | | | | |
| | | | | | | | | | | | | | |
| | | STO | RM SEW | ER DES | [GN by | the Modif | ied R | lational | L Me | thod | | | |
| | | | | | | | | | | | | | |
| | | | Ne | twork I | Design | Table for | Catc | hment | 7 | | | | |
| | | | | _ | | | | | | | | | |
| | | | | « — Ir | ndicates | pipe capac | ity < | flow | | | | | |
| | | | | | | | | | | | | | |
| PN | Lengt | h Fall | L Slope | I.Area | T.E. | Base | k | n | HYD | DIA | Secti | on Type | Auto |
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow (l/s) | (mm) | : | SECT | (mm) | | | Desig |
| | F O C | 10 0 5 5 | 4 000 | | 10.00 | - - | | 0 00- | | 0000 | - | o a - | |
| SI.000 | 59.3 | 10 0.20 | 4 290. | / 3.395 | 10.00 | 0.0 | | 0.035 3 | 5 \=/ | 2000 | 1: | 3 Swale | |
| S1 002 | 12 2 | 07 0.∠0 75 ∩ ∩२ | 4 294.9 3 372 (|) 0.182 | 0.00 | 0.0 | | 0.035 3 | , (=/ ; | 2000 | 1: 1· | 3 Swale | |
| S1.003 | 48 4 | ,5 0.03 19 0 16 | 9 286 9 | 5 0 049 | 0 00 | 0.0 | | 0.035 3 | $\langle - \rangle$ | 2000 | 1 · | 3 Swale | |
| s1.004 | 60.0 | 79 0.20 | 2 297 | 1 0.282 | 0.00 | 0.0 | | 0.035 3 | $\langle -/$ | 2000 | 1: | 3 Swale | |
| s1.005 | 63.3 | 94 0.20 | 2 313.8 | 3 0.292 | 0.00 | 0.0 | | 0.035 3 | × | 2000 | 1: | 3 Swale | |
| S1.006 | 26.5 | 66 0.08 | 7 305.4 | 1 0.336 | 0.00 | 0.0 | | 0.035 3 | k \=/ | 2000 | 1: | 3 Swale | 1 |
| S1.007 | 153.7 | 85 0.45 | 0 341. | 7 0.000 | 0.00 | 0.0 | | 0.035 3 | | 3900 | 1: | 3 Swale | 🍝 |
| | | | | | | | | | | | | | - |
| S2.000 | 74.9 | 62 0.36 | 0 208.0 | 0.257 | 10.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | 8 |
| S2.001 | 72.6 | 14 0.34 | 9 208.3 | L 0.292 | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | 8 |
| S2.002 | 63.5 | 73 0.30 | 6 207.8 | 3 0.230 | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | 8 |
| S2.003 | 26.3 | 34 0.12 | 7 207.4 | 1 0.173 | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | 💆 |
| S2.004 | 22.2 | 76 0.10 | 7 208.2 | 2 0.040 | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | |
| S2.005 | 58.1- | 42 0.28 | 0 207. E 207. | | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | |
| SZ.006 | 42.5 | 41 U.ZU 62 0 06 | 5 207.S | 5 0.052 | 0.00 | 0.0 | 0.600 | | 0 | 700 | Pipe/ | Conduit | |
| S2.007 | 11 9 | 02 0.00 | 0 198 5 | 5 0.003 | 0.00 | 0.0 | 0.000 | 0 035 3 | 2 | 2000 | ripe/ | 3 Swale | |
| S2.000 | 126 2 | 96 0.00 | 5 515 9 | 5 0.001 | 0.00 | 0.0 | | 0.035 3 | $\langle -/$ | 2100 | 1. | 3 Swale | |
| 52.005 | 120.2 | 0.21 | 5 515. | 0.000 | 0.00 | 0.0 | | 0.000 0 | , , , | 2100 | 1. | 5 Sware | |
| | | | | N | etwork | Results 2 | Table | | | | | | |
| | | | | | | | | | | | | | |
| 1 | PN | Rain | T.C. | US/IL Σ | I.Area | Σ Base | Foul | Add Flo | w Ve | el | Cap | Flow | |
| | () | mm/hr) | (mins) | (m) | (ha) | Flow (l/s) | (l/s) | (l/s) | (m, | /s) (| 1/s) | (l/s) | |
| | 0.00 | E0.00 | 10.00 | 2 150 | 2 205 | 0.0 | <u> </u> | 0 | 0 0 | 10 1 | ED (| 450.0 | |
| S1 | .000 | 50.00 | 14 70 | 3.150 | 3.395 | 0.0 | 0.0 | 0. | 0 0 | .42 1 42 1 | こ ろ・6 ≪ | 459.8 191 1 | |
| | 002 | 50.00 | 15 22 | 2.940 2 742 | 3.5// | 0.0 | 0.0 | 0. | | .44 L 37 1 | 35 8% | 404.4 506 4 | |
| Q1 | .002 | 50.00 | 17 25 | 2.709 | 3 789 | 0.0 | 0.0 | 0. | 0 0 | . 42 1 | 54.8 <i>4</i> | 513 0 | |
| S1 | .004 | 50.00 | 19.67 | 2.540 | 4.071 | 0.0 | 0.0 | 0. | 0 0 | 41 1 | 51.9« | 551.3 | |
| S1 | .005 | 50.00 | 22.30 | 2.338 | 4.363 | 0.0 | 0.0 | 0. | 0 0 | 40 1 | 47.9« | 590.8 | |
| s1 | .006 | 50.00 | 23.38 | 2.136 | 4.699 | 0.0 | 0.0 | 0. | 0 0 | .41 1 | 49.9« | 636.3 | |
| S1 | .007 | 50.00 | 29.70 | 2.049 | 4.699 | 0.0 | 0.0 | 0. | 0 0 | .41 2 | 64.8« | 636.3 | |
| | | | | | | | | | | | | | |
| S2 | .000 | 50.00 | 10.67 | 3.700 | 0.257 | 0.0 | 0.0 | 0. | 0 1 | 86 | 713.9 | 34.8 | |
| S2 | .001 | 50.00 | 11.33 | 3.340 | 0.550 | 0.0 | 0.0 | 0. | 0 1 | 85 | 713.8 | 74.4 | |
| S2 | .002 | 50.00 | 11.90 | 2.991 | 0.780 | 0.0 | 0.0 | 0. | 0 1 | .86 | 714.4 | 105.6 | |
| S2 | .003 | 50.00 | 12.13 | 2.685 | 0.953 | 0.0 | 0.0 | 0. | 0 1 | .86 | 715.1 | 129.0 | |
| S2 | .004 | 50.00 | 12.33 | 2.558 | 0.993 | 0.0 | 0.0 | 0. | 0 1 | .85 | /13.6 | 134.4 | |
| S2 | .005 | 50.00 | 12.86 | 2.451 | 1.032 | 0.0 | 0.0 | 0. | U 1 | .86 | /14.5 | 139.8 | |
| S2 | .005 | 50.00 | 12.24 | 2.1/1 | 1 1 47 | 0.0 | 0.0 | υ. | | .00 00 | 114.8 722 1 | 146.8 155 / | |
| 52 co | 008 | 50.00 | 13 71 | 1 001 | 1 170 | 0.0 | 0.0 | 0. | 0 0 | .00 51 | 123.4 186 0 | 159.4 | |
| s2 c2 | .009 | 50.00 | 20 41 | 1.844 | 1 179 | 0.0 | 0.0 | 0. | 0 0 | .J⊥ .32 1 | 20.64 | 159 6 | |
| 52 | | 50.00 | 20.11 | 1.011 | ±•±/9 | 0.0 | 0.0 | 0. | 5 0 | | | | |
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| BuroH | appold | l Ltd | | | | | | | | | Pa | .ge 2 | |
|---------|--------|--------------------|----------------|---------|----------------|-------------|------------|---------|----------------|------------|-----------|----------------------|----------|
| Camde | n Mill | - | | | | | | | | | | | |
| Lower | Brist | ol Ro | ad | | | | | | | | | | |
| Bath | | | | | | | | | | | M | licro | |
| Date | 21/02/ | 2022 | 09 : 43 | |] | Designed by | y Stei | fan Gar | ndler | | ň | cainac | |
| File 1 | NLGEP | Storm | water | Model | | Checked by | | | | | D | ימווומנ | Je |
| Innov | yze | | | | i | Network 202 | 20.1.3 | 3 | | | | | |
| | | | | | | | | | | | | | |
| | | STO | RM SEV | VER DES | IGN b | y the Modi | fied | Rationa | al Me | etho | d | | |
| | | | | | - · | | a . | | - | | | | |
| | | | Ne | etwork | Desig | n Table to | r Cat | chment | / | | | | |
| PN | Length | n Fall | Slope | I.Area | T.E. | Base | k | n | HYD | DIA | Secti | ion Type | Auto |
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow (l/s) | (mm) | | SECT | (mm) | | | Design |
| | | | | | | | | | | | | | |
| S1.008 | 26.413 | 3 0.132 | 200.0 | 1.681 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 2000 | 1: | :3 Swale | a |
| S1.009 | 48.972 | 2 0.757 | 64.7 | 0.000 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 2000 | 1: | 3 Swale | ē |
| G3 000 | 76 250 | | 100 0 | 0 202 | 10.00 | | | 0 025 7 | 2 _/ | 600 | 1 | 3 0 | |
| S3.000 | 76.350 |) 0.382) 0.382 | 199.9 | 0.363 | 10.0(10.0(|) 0.0 | | 0.035 | > \=/ 3 \=/ | 600 600 | ⊥: 1 · | :s swa⊥e :3 Swale | |
| \$3.002 | 36.179 | 0.181 | 199.9 | 0.353 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 600 | 1: | :3 Swale | Ä |
| s3.003 | 51.340 | 0.257 | 199.8 | 0.407 | 0.00 | 0.0 | 0.600 | | · , 0 | 600 | Pipe/ | /Conduit | Ă |
| S3.004 | 59.200 | 0.296 | 200.0 | 0.540 | 0.00 | 0.0 | 0.600 | | 0 | 600 | Pipe/ | /Conduit | ă |
| S3.005 | 11.855 | 5 0.059 | 200.9 | 0.158 | 0.00 | 0.0 | 0.600 | | 0 | 600 | Pipe/ | /Conduit | ē |
| S3.006 | 45.685 | 5 0.228 | 200.4 | 0.112 | 0.00 | 0.0 | | 0.035 | 3 \=/ | 1000 | 1: | :3 Swale | 0 |
| S3.007 | 72.239 | 0.361 | 200.0 | 0.228 | 0.00 | 0.0 | | 0.035 3 | 3 \=/ | 2000 | 1: | :3 Swale | |
| S3.008 | 61.021 | 0.644 | 94.8 | 0.000 | 0.00 | 0.0 | | 0.035 3 | 3 \=/ | 3000 | 1: | :3 Swale | 8 |
| s1.010 | 25.293 | 3 0.126 | 200.0 | 0.466 | 0.00 | 0.0 | | 0.035 3 | 3 \=/ | 500 | 1: | :3 Swale | 8 |
| | | | | 1 | Netwo | ck Results | Table | 2 | | | | | |
| P | PN F | Rain | T.C. | US/IL Σ | I.Are | a ΣBase | Foul | Add Fl | ow V | el | Cap | Flow | |
| | (m | m/hr) | (mins) | (m) | (ha) | Flow (l/s) | (1/s) | (l/s) | (m | /s) | (l/s) | (1/s) | |
| | | | | | | | | | | | | | |
| S1. | 800 | 50.00 | 30.00 | 1.599 | 7.55 | 9 0.0 | 0.0 | 0 | .0 0 | .50 | 185.2« | 1023.6 | |
| S1. | .009 | 50.00 | 30.00 | 1.467 | 7.55 | 9 0.0 | 0.0 | 0 | .0 0 | .89 | 325.7« | 1023.6 | |
| s3. | .000 | 50.00 | 12.89 | 4.200 | 0.36 | 3 0.0 | 0.0 | 0 | .0 0 | .44 | 69.4 | 49.2 | |
| s3. | 001 | 50.00 | 15.78 | 3.818 | 1.31 | 8 0.0 | 0.0 | 0 | .0 0 | .44 | 69.4« | 178.4 | |
| S3. | .002 | 50.00 | 17.15 | 3.436 | 1.67 | 1 0.0 | 0.0 | 0 | .0 0 | .44 | 69.3« | 226.3 | |
| s3. | .003 | 50.00 | 17.65 | 3.255 | 2.07 | 7 0.0 | 0.0 | 0 | .0 1 | .72 | 486.1 | 281.3 | |
| S3. | 004 | 50.00 | 18.22 | 2.998 | 2.61 | 8 0.0 | 0.0 | 0 | .0 1 | .72 | 485.8 | 354.5 | |
| S3. | 005 | 50.00 | 18.34 | 2.702 | 2.77 | 6 0.0 | 0.0 | 0 | .0 1 | .71 | 484.7 | 375.9 | |
| S3. | 006 | 50.00 | 19.96 | 1.943 | 2.88 | 7 0.0 | 0.0 | 0 | .0 0 | .47 | 101.8« | 391.0 | |
| S3. | .007 | 50.00 | 22.35 | 1.715 | 3.11 | 5 0.0 | 0.0 | 0 | .0 0 | .50 | 185.2« | 421.8 | |
| 53. | .008 | 50.00 | 23.70 | 1.354 | 3.11 | 5 0.0 | 0.0 | 0 | .0 0 | .76 | 391.9« | 421.8 | |
| S1. | 010 | 50.00 | 30.00 | 0.710 | 11.14 | 0 0.0 | 0.0 | 0 | .0 0 | .43 | 61.3« | 1508.5 | |
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| L | | | | | | | _ · - | | | | | | |

| BuroHappold 1 | Ltd | | | | | Page 3 |
|---------------|---------------------|-------------|-----------|-----------|-----------|------------|
| Camden Mill | | | | | | |
| Lower Bristo | l Road | | | | | |
| Bath | | | | | | Micco |
| Date 21/02/20 | 022 09:43 | Design | ed b | v Stefan | Gandler | |
| File NLGEP St | tormwater Model | Checke | d by | y beeran | Ganarer | Drainage |
| | collimater Houter . | Notuon | | 20 1 2 | | |
| тшоууге | | Networ | K 20. | 20.1.3 | | |
| | Area | Summary fo | r Ca | tchmont - | 7 | |
| | <u>Aica</u> | building it | | | <u></u> | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | - (ha) |
| 1 000 | | | | | 0 0 7 0 | 0.070 |
| 1.000 | Classification | Rooi | 90 | 0.300 | 0.270 | 0.270 |
| | Classification | ROOI | 90 | 2 007 | 1 806 | 2 121 |
| | Classification | Roof | 90 | 0 012 | 0 011 | 2 132 |
| | Classification | Grass | 30 | 0.107 | 0.032 | 2.164 |
| | Classification | Road | 75 | 0.293 | 0.220 | 2.384 |
| | Classification | Road | 75 | 0.548 | 0.411 | 2.795 |
| | Classification | Road | 75 | 0.247 | 0.185 | 2.980 |
| | Classification | Roof | 90 | 0.012 | 0.011 | 2.991 |
| | Classification | Road | 75 | 0.032 | 0.024 | 3.015 |
| | Classification | Roof | 90 | 0.012 | 0.011 | 3.026 |
| | Classification | Roof | 90 | 0.200 | 0.180 | 3.206 |
| | Classification | Roof | 90 | 0.020 | 0.018 | 3.224 |
| | Classification | Roof | 90 | 0.004 | 0.003 | 3.227 |
| | Classification | Roof | 90 | 0.011 | 0.010 | 3.237 |
| | Classification | Road | 75 | 0.150 | 0.112 | 3.350 |
| | Classification | Roof | 90 | 0.046 | 0.041 | 3.391 |
| 1 001 | Classification | Road | 75 | 0.006 | 0.005 | 3.395 |
| 1.001 | Classification | Grass | 30 | 0.304 | 0.091 | 0.091 |
| | Classification | Road | 75 | 0.062 | 0.046 | 0.138 |
| 1.002 | Classification | Grass | 30 | 0.210 | 0.063 | 0.063 |
| 1.002 | Classification | Road | 75 | 0.132 | 0.099 | 0.162 |
| 1.003 | Classification | Road | 75 | 0.065 | 0.049 | 0.049 |
| 1.004 | Classification | Grass | 30 | 0.141 | 0.042 | 0.042 |
| | Classification | Road | 75 | 0.063 | 0.047 | 0.089 |
| | Classification | Road | 75 | 0.257 | 0.193 | 0.282 |
| 1.005 | Classification | Road | 75 | 0.056 | 0.042 | 0.042 |
| | Classification | Grass | 30 | 0.192 | 0.057 | 0.099 |
| | Classification | Road | 75 | 0.257 | 0.193 | 0.292 |
| 1.006 | Classification | Grass | 30 | 0.146 | 0.044 | 0.044 |
| | Classification | Road | 75 | 0.148 | 0.111 | 0.154 |
| 1 007 | CLASSIFICATION | Road | 100 | 0.242 | 0.182 | 0.336 |
| 2 000 | - Classification | - Poof | 00 100 | 0.000 | 0.000 | 0.000 |
| 2.000 | Classification | Grace | 30 20 | 0.229 | 0.200 | 0.200 |
| 2.001 | Classification | Roof | 90 | 0.203 | 0.183 | 0.183 |
| 2.001 | Classification | Grass | 30 | 0.366 | 0.110 | 0.292 |
| 2.002 | Classification | Roof | 90 | 0.197 | 0.178 | 0.178 |
| | Classification | Grass | 30 | 0.141 | 0.042 | 0.220 |
| | Classification | Road | 75 | 0.014 | 0.010 | 0.230 |
| 2.003 | Classification | Roof | 90 | 0.141 | 0.126 | 0.126 |
| | Classification | Grass | 30 | 0.127 | 0.038 | 0.164 |
| | Classification | Road | 75 | 0.011 | 0.009 | 0.173 |
| 2.004 | Classification | Grass | 30 | 0.107 | 0.032 | 0.032 |
| | Classification | Road | 75 | 0.010 | 0.007 | 0.040 |
| 2.005 | Classification | Road | 75 | 0.053 | 0.040 | 0.040 |
| 2.006 | Classification | Grass | 30 | 0.173 | 0.052 | 0.052 |
| 2.007 | Classification | Grass | 3U 75 | 0.210 | 0.003 | 0.000 |
| 2.008 | - | road – | 100 | 0.042 | 0.031 | 0.000 |
| 2.009 | | | 100 | 0.000 | 0.000 | 0.000 |
| | (| 01982-2020 | Inno | ovyze | | |

| BuroHappold 1 | Ltd | | | | | Page 4 | | |
|--|---------------------------------------|-----------------|-----------|----------------------|--|-----------------|--|--|
| Camden Mill | | | | | | | | |
| Lower Bristo | l Road | | | | | 1 | | |
| Bath | | | | | | | | |
| Data 01/00/0/ | 202 00 42 | Desta | 1 1. | | 0 | — MICCO | | |
| Date 21/02/20 | J22 09:43 | Design | ed by | y Stefan | Gandler | Drainage | | |
| File NLGEP St | cormwater Mode | 1 Checke | d by | | | Brainiage | | |
| Innovyze | | Networ | k 202 | 20.1.3 | | | | |
| | | | | | | | | |
| | Ar | ea Summary fo | or Ca | tchment ⁻ | 7 | | | |
| | | | | | _ | | | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total | | |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) | | |
| | | _ | | | | | | |
| 1.008 | Classification | Grass | 30 | 0.100 | 0.030 | 0.030 | | |
| | Classification I | Grade | 20 | 0.745 | 0.745 | 0.775 | | |
| | Classification | Grass | 30 | 0.111 | 0.033 | 0.808 | | |
| | Classification | ROOL | 90 75 | 0.090 | 0.081 | 0.889 | | |
| | Classification | KUAD | 20 12 | 0.036 | 0.02/ | 0.91/ | | |
| | Classification | GLASS | 30 30 | 0.14/ | 0.044 | 1 047 | | |
| | Classification | Road | 75 | 0.207 | 0.000 | 1.681 | | |
| 1 009 | - | - | 100 | 0.040 | 0.034 | 0.000 | | |
| 3 000 | Classification | Grace | 3U 700 | 0.000 | 0.000 | 0 165 | | |
| 5.000 | Classification | Roof | 90 | 0.220 | 0 198 | 0.363 | | |
| 3.001 | Classification | Grass | 30 | 0.216 | 0.065 | 0.065 | | |
| 0.001 | Classification | Roof | 90 | 0.485 | 0.437 | 0.501 | | |
| | Classification | Roof | 90 | 0.504 | 0.453 | 0.955 | | |
| 3.002 | Classification | Grass | 30 | 0.322 | 0.096 | 0.096 | | |
| | Classification | Roof | 90 | 0.285 | 0.257 | 0.353 | | |
| 3.003 | Classification | Roof | 90 | 0.452 | 0.407 | 0.407 | | |
| 3.004 | Classification | Grass | 30 | 0.204 | 0.061 | 0.061 | | |
| | Classification | Roof | 90 | 0.532 | 0.479 | 0.540 | | |
| 3.005 | Classification | Grass | 30 | 0.052 | 0.016 | 0.016 | | |
| | Classification | Road | 75 | 0.149 | 0.112 | 0.127 | | |
| | Classification | Grass | 30 | 0.102 | 0.031 | 0.158 | | |
| 3.006 | Classification | Road | 75 | 0.126 | 0.095 | 0.095 | | |
| | Classification | Road | 75 | 0.013 | 0.009 | 0.104 | | |
| | Classification | Grass | 30 | 0.025 | 0.007 | 0.112 | | |
| 3.007 | Classification | Grass | 30 | 0.157 | 0.047 | 0.047 | | |
| | Classification | Grass | 30 | 0.186 | 0.056 | 0.103 | | |
| | Classification | Road | 75 | 0.166 | 0.124 | 0.228 | | |
| 3.008 | - | - | 100 | 0.000 | 0.000 | 0.000 | | |
| 1.010 | Classification | Grass | 30 | 0.435 | 0.131 | 0.131 | | |
| | Classification I | Detention Basin | TOO | 0.222 | 0.222 | 0.352 | | |
| | Classification | Grass | 30 | 0.353 | 0.106 | 0.458 | | |
| | Classification | Grass | 3U 20 | 0.012 | 0.004 | 0.462 | | |
| | CIASSILICALION | Grass | 30 | U.UID | U.UU4 | U.400 Total | | |
| | | | | 16 731 | 10LAL | 10Lai 11 140 | | |
| | | | | 10.751 | 11.140 | 11.140 | | |
| | Cimula | tion Critori | a foi | c Catabma | nt 7 | | | |
| | SIMULO | CION CIICEII | а 101 | | 11L / | | | |
| | - 1 | 955 0 750 | 7 .1.1.4 | | о . С П. н | | | |
| V | Diumetric Runoii Nacal Daduation I | COEII U./50 . | Additi | LONAL FLOW | - % OI lot | Cal Flow 0.000 | | |
| 1 | Heal Reduction r | (ming) | 1*12 | ADD FACLOF | " IUM"/Ma | Storage 2.000 | | |
| | Hot Start Level | (millio) U El | | r Person n | $\frac{1}{2} \sum_{n=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^$ | per/day 0 000 | | |
| Manhole 4 | adloss Coeff (C) | obal) 0 500 | ow her | rerson be | Rin Time | (mins) 60 | | |
| Foul Ser | wage per hectare | (1/s) 0.000 | | ות דוו | it Interval | (mins) 1 | | |
| I OUI DE | | (1)5, 0.000 | | Jucpt | at incerval | | | |
| Number of Input Hydrographs 0 Number of Storage Structures 2 | | | | | | | | |
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| BuroHappold Ltd | | Page 5 |
|------------------------------|----------------------------|----------|
| Camden Mill | | rage 5 |
| Lower Bristol Road | | |
| Bath | | |
| Date $21/02/2022$ 09.43 | Designed by Stefan Gandler | MICLO |
| File NICEP Stormwater Model | Charled by Steran Ganater | Drainage |
| The NEGER Scoliniwater Model | Natural 2020 1 2 | |
| ТШОУУ2е | Network 2020.1.5 | |
| Simulation (| Criteria for Catchment 7 | |
| Supthat | ia Dainfall Dotaila | |
| Synched | IC RAINIALI DELALIS | |
| Rainfall Mode | el FEH | |
| Return Period (years | s) 100 | |
| FEH Rainfall Versio | DN 1999 | |
| | -0.025 | |
| D1 (1kr | n) 0.330 | |
| D2 (1kr | n) 0.312 | |
| D3 (1ki | n) 0.298 | |
| E (1kr | n) 0.300 | |
| E' (Iki | n) 2.451 | |
| Winter Stor | ns Yes | |
| Cv (Summe: | r) 0.750 | |
| Cv (Winte: | r) 0.840 | |
| Storm Duration (min: | s) 30 | |
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|-----------------------------|---|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Urainage |
| | Network 2020 1 3 | |
| | | |
| Online Cor | ntrols for Catchment 7 | |
| | | |
| | | |
| Orifice Manhole: S5, I | DS/PN: S1.008, Volume (m³): 1101. | 4 |
| | | |
| Diameter (m) 0.091 Discharg | e Coefficient 0.600 Invert Level (m) 1. | .599 |
| | | - |
| Orifice Manhole: S6, | DS/PN: SI.010, Volume (m ³): 5/9. | 5 |
| Diameter (m) 0 099 Discharg | e Coefficient (600 Invert Level (m) (| 710 |
| | e coefficient 0.000 invert hevel (m) 0. | . / 10 |
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| BuroHappold Ltd | | Page 7 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Diamaye |
| Innovyze | Network 2020.1.3 | |
| | | |
| Storage Str | uctures for Catchment 7 | |
| | | |
| Infiltration Basi | In Manhole: S5, DS/PN: S1.008 | |
| Inver Infiltration Coefficient Infiltration Coefficient | t Level (m) 1.599 Safety Factor 2.0 Base (m/hr) 0.00000 Porosity 1.00 Side (m/hr) 0.00000 | |
| Depth (m) Area (m ²) Dep | oth (m) Area (m ²) Depth (m) Area (m ²) | |
| 0.000 6397.7 | 0.700 7007.0 0.950 7459.1 | |
| Infiltration Basi | In Manhole: S6, DS/PN: S1.010 | |
| Inver Infiltration Coefficient Infiltration Coefficient | t Level (m) 0.710 Safety Factor 2.0 Base (m/hr) 0.00000 Porosity 1.00 Side (m/hr) 0.00000 | |
| Depth (m) Area (m ²) Dep | oth (m) Area (m ²) Depth (m) Area (m ²) | |
| 0.000 1486.6 | 0.600 1742.8 1.500 2215.0 | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Digitiga |
| Innovvze | Network 2020.1.3 | |
| | | |
| 1 year Return Period Summary of | Critical Results by Maximum Leve | el (Rank 1) |
| f | or Catchment 7 | i |
| _ | | |
| | | |
| <u>Si</u> | mulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Flo MADD Factor * 10m ³ /ba Stora | ow 0.000 |
| Hot Start Level (mm) | 0 Inlet Coefficies | nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/da | y) 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | |
| Number of Input Hudrog | contra 0 Number of Storage Structures 2 | |
| Number of Online Cont | rols 2 Number of Time/Area Diagrams 0 | |
| Number of Offline Cont | rols 0 Number of Real Time Controls 0 | |
| | | |
| Synthe | etic Rainfall Details | |
| Rainiali Mode FEH Rainfall Versid | EL FEH n 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (1kr | n) -0.025 | |
| D1 (1kr | n) 0.330 | |
| D2 (1kr | n) 0.312 | |
| E (1kr | n) 0.298 | |
| F (1kr | n) 2.451 | |
| Cv (Summe: | c) 0.750 | |
| Cv (Winte: | c) 0.840 | |
| Margin for Flood Risk War | aing (mm) 300 | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| D | TS Status OF | Έ |
| D | 7D Status C |)N |
| Inert | La Status C |)N |
| | | |
| Profile(s) | Summer and Winte | er |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| Return Period(s) (years) | I, 30, 10 0 40 4 | 10 |
| | 0, 10, 1 | |
| | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | o full. |
| | | |
| | | Water |
| US/MH Return Clim | ate First (X) First (Y) First (Z) Overf | low Level |
| PN Name Storm Period Char | nge Surcharge Flood Overflow Act | (m) |
| S1.000 S1 15 Winter 1 | +0% | 3.369 |
| S1.001 S2 15 Winter 1 | +0% | 3.170 |
| S1.002 S2 15 Winter 1 | +0% | 2.979 |
| S1.003 S4 15 Winter 1 | +0% | 2.929 |
| S1.004 S4 IS WINTER I S1.005 S4 15 Winter 1 | +0% | 2.762 |
| S1.006 S6 30 Winter 1 | +0% | 2.356 |
| S1.007 S3 30 Winter 1 | +0% | 2.210 |
| <u>∩</u> 19 | 82-2020 Innovyze | |
| | 22 2020 Imovy20 | |

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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | · |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 7</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.000 | S1 | -0.631 | 0.000 | 0.07 | | | 303.5 | OK | |
| S1.001 | S2 | -0.820 | 0.000 | 0.05 | | | 307.2 | OK | |
| S1.002 | S2 | -0.521 | 0.000 | 0.12 | | | 309.2 | OK | |
| S1.003 | S4 | -0.571 | 0.000 | 0.08 | | | 307.9 | OK | |
| S1.004 | S4 | -0.738 | 0.000 | 0.06 | | | 307.2 | OK | |
| S1.005 | S4 | -0.438 | 0.000 | 0.12 | | | 300.4 | OK | |
| S1.006 | S6 | -0.728 | 0.000 | 0.06 | | | 300.0 | OK | |
| S1.007 | S3 | -0.539 | 0.000 | 0.07 | | | 299.7 | OK | |

| BuroH | appolo | l Ltc | l | | | | | | | Page | 10 |
|--|--------|----------|--------|---------|---------|----------|--------|-----------|-----------|-----------|-------|
| Camde | n Mill | <u> </u> | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | | | | | | | | | Micc | |
| Date | 21/02/ | /2022 | 09.43 | 2 | г | Designed | 1 hv 9 | tofan Ga | ndler | | U |
| Eile NICED Charmyston Medel Checked by | | | | | | | | | | | nade |
| File NLGEP Stormwater Model Checked by | | | | | | | | | | | |
| Innov | yze | | | | 1 | letwork | 2020. | 1.3 | | | |
| | | | | | | | | | | | |
| <u>1 yea</u> | ar Ret | urn | Period | l Summa | ry of (| Critica | l Resi | ults by M | aximum Le | evel (Ran | nk 1) |
| | | | | | for | Catchm | ent 7 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | Water |
| | US/MH | | | Return | Climate | First | (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | S | torm | Period | Change | Surch | arge | Flood | Overflow | Act. | (m) |
| | | | | | - | | 2 | | | | • • |
| S2.000 | S4 | 15 | Winter | 1 | +0% | | | | | | 3.786 |
| S2.001 | S5 | 15 | Winter | 1 | +0% | | | | | | 3.475 |
| S2.002 | S10 | 15 | Winter | 1 | +0% | | | | | | 3.152 |
| S2.003 | S6 | 15 | Winter | 1 | +0% | 100/15 | Summer | | | | 2.883 |
| S2.004 | S13 | 15 | Winter | 1 | +0% | 100/15 | Summer | | | | 2.760 |
| S2.005 | S12 | 15 | Winter | 1 | +0% | 100/15 | Winter | | | | 2.635 |
| S2.006 | S15 | 15 | Winter | 1 | +0% | 100/15 | Summer | | | | 2.362 |
| S2.007 | S7 | 15 | Winter | 1 | +0% | 100/15 | Summer | | | | 2.191 |
| S2.008 | S17 | 15 | Winter | 1 | +0% | | | | | | 2.017 |
| S2.009 | S8 | 15 | Winter | 1 | +0읭 | | | | | | 1.982 |
| S1.008 | S5 | 1440 | Winter | 1 | +0읭 | | | | | | 1.848 |
| S1.009 | S20 | 1440 | Winter | 1 | +0읭 | | | | | | 1.480 |
| S3.000 | S11 | 15 | Winter | 1 | +0읭 | | | | | | 4.300 |
| S3.001 | S18 | 15 | Winter | 1 | +0읭 | | | | | | 4.014 |
| S3.002 | S12 | 15 | Winter | 1 | +0% | | | | | | 3.650 |
| S3.003 | S23 | 15 | Winter | 1 | +0% | 30/15 | Summer | | | | 3.515 |
| S3.004 | S13 | 15 | Winter | 1 | +0읭 | 30/15 | Summer | | | | 3.317 |
| S3.005 | S14 | 15 | Winter | 1 | +0% | 30/15 | Summer | | | | 3.100 |
| S3.006 | S25 | 15 | Winter | 1 | +0읭 | | | | | | 2.179 |
| S3.007 | S22 | 15 | Winter | 1 | +0% | | | | | | 1.899 |
| S3.008 | S15 | 15 | Winter | 1 | +0% | | | | | | 1.471 |
| S1.010 | S6 | 1440 | Winter | 1 | +0% | | | | | | 1.149 |
| | | | | | | | | | | | |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|---------|-------|------------|---------|--------|----------|------------|-------|--------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (l/s) | Status | Exceeded |
| s2.000 | S4 | -0.614 | 0.000 | 0.04 | | | 23.2 | OK | |
| S2.001 | S5 | -0.565 | 0.000 | 0.08 | | | 52.1 | OK | |
| S2.002 | S10 | -0.539 | 0.000 | 0.12 | | | 74.0 | OK | |
| s2.003 | S6 | -0.502 | 0.000 | 0.18 | | | 90.4 | OK | |
| S2.004 | S13 | -0.498 | 0.000 | 0.18 | | | 93.8 | OK | |
| S2.005 | S12 | -0.516 | 0.000 | 0.15 | | | 96.5 | OK | |
| 52.006 | S15 | -0.509 | 0.000 | 0.17 | | | 99.4 | OK | |
| 52.007 | S7 | -0.475 | 0.000 | 0.23 | | | 104.1 | OK | |
| 52.008 | S17 | -0.883 | 0.000 | 0.02 | | | 105.9 | OK | |
| 52.009 | S8 | -0.663 | 0.000 | 0.04 | | | 105.7 | OK | |
| 51.008 | S5 | -0.701 | 0.000 | 0.00 | | | 7.8 | OK | |
| 51.009 | S20 | -0.904 | 0.000 | 0.00 | | | 7.8 | OK | |
| 53.000 | S11 | -0.800 | 0.000 | 0.01 | | | 32.5 | OK | |
| 53.001 | S18 | -1.086 | 0.000 | 0.01 | | | 126.8 | OK | |
| \$3.002 | S12 | -1.450 | 0.000 | 0.01 | | | 156.1 | OK | |
| s3.003 | S23 | -0.340 | 0.000 | 0.39 | | | 188.9 | OK* | |
| S3.004 | S13 | -0.281 | 0.000 | 0.55 | | | 237.2 | OK | |
| s3.005 | S14 | -0.202 | 0.000 | 0.77 | | | 247.5 | OK | |
| S3.006 | S25 | -1.721 | 0.000 | 0.01 | | | 254.2 | OK | |
| S3.007 | S22 | -0.402 | 0.000 | 0.11 | | | 260.7 | OK | |

| BuroHappold Ltd | | Page 11 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 7</u>

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|--------|-------|------------|---------|--------|----------|------------|-------|--------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (1/s) | (mins) | (l/s) | Status | Exceeded |
| S3.008 | S15 | -0.883 | 0.000 | 0.02 | | | 260.7 | OK | |
| S1.010 | S6 | -1.061 | 0.000 | 0.00 | | | 12.4 | OK | |

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|--|--|----------------|--|--|--|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | | |
| Bath | | Micro | | | | | | | | | | |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado | | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamage | | | | | | | | | | |
| Innovyze | Network 2020.1.3 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank | | | | | | | | | | | | |
| for Catchment 7 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| S | imulation Criteria | | | | | | | | | | | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 | | | | | | | | | | |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ige 2.000 | | | | | | | | | | |
| Hot Start Level (mm) | 0 Inlet Coefficcie | ent 0.800 | | | | | | | | | | |
| Foul Sewage per hectare (1/s) | 0.000 | (y) 0.000 | | | | | | | | | | |
| | | | | | | | | | | | | |
| Number of Input Hydrog | raphs 0 Number of Storage Structures 2 | | | | | | | | | | | |
| Number of Online Con | trols 2 Number of Time/Area Diagrams 0 | | | | | | | | | | | |
| | ciois o Number of Acui fine conclois o | | | | | | | | | | | |
| Synth | etic Rainfall Details | | | | | | | | | | | |
| Rainfall Mod | el FEH | | | | | | | | | | | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | | | | | | | | | | | |
| C (1k | m) -0.025 | | | | | | | | | | | |
| D1 (1k | m) 0.330 | | | | | | | | | | | |
| D2 (1k | m) 0.312 | | | | | | | | | | | |
| D3 (1k | m) 0.298 | | | | | | | | | | | |
| E (1k | m) 0.300 | | | | | | | | | | | |
| F (1k | m) 2.451 | | | | | | | | | | | |
| CV (Summe CV (Winte | r) 0.750 | | | | | | | | | | | |
| | , | | | | | | | | | | | |
| Margin for Flood Risk War | ning (mm) 300 | .0 | | | | | | | | | | |
| Analysis | Timestep 2.5 Second Increment (Extended | d) FF | | | | | | | | | | |
| ם | VD Status (| ON | | | | | | | | | | |
| Inert | ia Status (| ON | | | | | | | | | | |
| | | | | | | | | | | | | |
| Profile(s) | Summer and Winte | er | | | | | | | | | | |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 40 | | | | | | | | | | |
| Return Period(s) (years) | 1, 30, 10 | 00 | | | | | | | | | | |
| Climate Change (%) | 0, 40, 4 | 40 | | | | | | | | | | |
| | | | | | | | | | | | | |
| WARNING: Half Drain Time has no | t been calculated as the structure is to | oo full. | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | Water | | | | | | | | | | |
| US/MH Beturn Cli | nate First (X) First (Y) First (Z) Over | flow Level | | | | | | | | | | |
| PN Name Storm Period Cha | nge Surcharge Flood Overflow Act | t. (m) | | | | | | | | | | |
| | 409 | 2 (22 | | | | | | | | | | |
| S1.000 S1 15 Winter 30 - | -403 -40% | 3.632 3.440 | | | | | | | | | | |
| S1.002 S2 15 Winter 30 | +40% | 3.258 | | | | | | | | | | |
| S1.003 S4 15 Winter 30 | +40% | 3.192 | | | | | | | | | | |
| S1.004 S4 15 Winter 30 | +40% | 3.028 | | | | | | | | | | |
| S1.005 S4 15 Winter 30 | +40% | 2.830 | | | | | | | | | | |
| S1.006 S6 15 Winter 30 | -40% | 2.617 | | | | | | | | | | |
| S1.007 S3 15 Winter 30 | +40% | 2.420 | | | | | | | | | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.368 | 0.000 | 0.31 | | | 1325.8 | OK | |
| S1.001 | S2 | -0.550 | 0.000 | 0.20 | | | 1331.3 | OK | |
| S1.002 | S2 | -0.242 | 0.000 | 0.51 | | | 1342.0 | FLOOD RISK* | |
| S1.003 | S4 | -0.308 | 0.000 | 0.37 | | | 1336.9 | OK | |
| S1.004 | S4 | -0.472 | 0.000 | 0.25 | | | 1334.9 | OK | |
| S1.005 | S4 | -0.170 | 0.000 | 0.54 | | | 1302.3 | FLOOD RISK* | |
| S1.006 | S6 | -0.467 | 0.000 | 0.25 | | | 1289.2 | OK | |
| S1.007 | S3 | -0.329 | 0.000 | 0.29 | | | 1199.8 | OK | |

| BuroH | appolo | l Ltc | 1 | | | | | | | Page | 14 |
|---|------------|-------|----------|--------|--------------|--------|----------|-----------|-----------|----------|----------------------|
| Camde | n Mill | | | | | | | | | | |
| Lower | Brist | ol F | Road | | | | | | | | |
| Bath | | | | | | | | | | | L |
| Data | 01/00 | (2022 | 00.10 |) | | | al la co | 1+ - f | | — MICI | 0 |
| Date 21/02/2022 09:45 Designed by Steran Gandler | | | | | | | | | | Drair | าลตค |
| File NLGEP Stormwater Model Checked by | | | | | | | | | | | lage |
| Innovyze Network 2020.1.3 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) | | | | | | | | | | | |
| | | | | | for | Catch | ment 7 | - | | | |
| | | | | | | | | - | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | Water |
| | US/MH | | | Return | Climate | First | : (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | S | torm | Period | Change | Surch | narge | Flood | Overflow | Act. | (m) |
| | | | | | | | | | | | |
| S2.000 | S4 | 15 | Winter | 30 | +40% | | | | | | 3.885 |
| S2.001 | S5 | 15 | Winter | 30 | +40% | | | | | | 3.653 |
| S2.002 | S10 | 15 | Winter | 30 | +40% | 100/15 | ~ | | | | 3.382 |
| S2.003 | S6 | 15 | Winter | 30 | +40% | 100/15 | Summer | | | | 3.196 |
| S2.004 | SI3 | 15 | Winter | 30 | +40% | 100/15 | Summer | | | | 3.074 |
| S2.005 | S12 | 15 | Winter | 30 | +40% | 100/15 | Winter | | | | 2.910 |
| S2.006 | SI5 | 15 | Winter | 30 | +40% | 100/15 | Summer | | | | 2.677 |
| S2.007 | S / | 1440 | Winter | 30 | +40% | 100/15 | Summer | | | | 2.567 |
| 52.008 | SI/ | 1440 | Winter | 30 | +408 | | | | | | 2.303 |
| 52.009 | 20 | 1440 | Winter | 20 | +403 | | | | | | 2.303 |
| S1.000 | 50 | 1440 | Winter | 20 | +40% | | | | | | 1 020 |
| 3 000 | 520 c11 | 1440 | Winter | 30 | +403 +409 | | | | | | 1.020 |
| S3.000 | S11 S18 | 15 | Winter | 30 | +40% | | | | | | 4.430 |
| S3 002 | S10 S12 | 15 | Winter | 30 | +40% | | | | | | 4 253 |
| S3.002 | S12 S23 | 15 | Winter | 30 | +40% | 30/15 | Summer | | | | 4 232 |
| S3 004 | S13 | 15 | Winter | 30 | +40% | 30/15 | Summer | | | | 4 066 |
| \$3.005 | S14 | 15 | Winter | 30 | +40% | 30/15 | Summer | | | | 3.572 |
| \$3.006 | S25 | 15 | Winter | 30 | +40% | 50,15 | Cummer | | | | 2.333 |
| s3.007 | S22 | 15 | Winter | 30 | +40% | | | | | | 2.038 |
| S3.008 | S15 | 1440 | Winter | 30 | +40% | | | | | | 1.827 |
| | 010 | | MILLICCI | 00 | | | | | | | T • • • • • • |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | |
|--------|-------|------------|---------|--------|----------|------------|-------|-------------|----------|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (l/s) | Status | Exceeded |
| | | | | | | | | | |
| S2.000 | S4 | -0.515 | 0.000 | 0.16 | | | 100.6 | OK | |
| S2.001 | S5 | -0.387 | 0.000 | 0.40 | | | 252.4 | OK | |
| S2.002 | S10 | -0.309 | 0.000 | 0.58 | | | 364.0 | OK | |
| S2.003 | S6 | -0.189 | 0.000 | 0.87 | | | 443.9 | OK | |
| S2.004 | S13 | -0.184 | 0.000 | 0.89 | | | 455.9 | OK | |
| S2.005 | S12 | -0.241 | 0.000 | 0.75 | | | 465.5 | OK | |
| S2.006 | S15 | -0.194 | 0.000 | 0.77 | | | 457.6 | OK | |
| S2.007 | S7 | -0.099 | 0.000 | 1.00 | | | 460.2 | OK | |
| S2.008 | S17 | -0.597 | 0.000 | 0.01 | | | 27.9 | OK | |
| S2.009 | S8 | -0.342 | 0.000 | 0.01 | | | 27.5 | OK | |
| S1.008 | S5 | -0.246 | 0.000 | 0.00 | | | 12.7 | FLOOD RISK* | |
| S1.009 | S20 | -0.556 | 0.000 | 0.00 | | | 12.8 | OK | |
| S3.000 | S11 | -0.670 | 0.000 | 0.04 | | | 140.7 | OK | |
| S3.001 | S18 | -0.806 | 0.000 | 0.06 | | | 506.1 | OK | |
| S3.002 | S12 | -0.847 | 0.000 | 0.02 | | | 400.7 | OK | |
| S3.003 | S23 | 0.377 | 0.000 | 0.97 | | | 472.8 | SURCHARGED* | |
| S3.004 | S13 | 0.468 | 0.000 | 1.28 | | | 556.4 | SURCHARGED | |
| S3.005 | S14 | 0.270 | 0.000 | 1.84 | | | 588.4 | SURCHARGED | |
| S3.006 | S25 | -1.567 | 0.000 | 0.03 | | | 633.3 | OK | |
| S3.007 | S22 | -0.263 | 0.000 | 0.30 | | | 709.9 | FLOOD RISK* | |
| | | | | ©1982- | 2020 Inr | novyze | | | |

| BuroHappold Ltd | | Page 15 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S3.008 | S15 | -0.527 | 0.000 | 0.01 | | | 73.6 | OK | |
| S1.010 | S6 | -0.385 | 0.000 | 0.00 | | | 20.9 | OK | |

| BuroHappol | ld Ltd | | | | Page 16 |
|-----------------|-----------------------|--------------|----------------------------|---------------------|----------------|
| Camden Mil | 11 | | | | |
| Lower Bris | stol Road | | | | |
| Bath | | | | | Micco |
| Date 21/02 | 2/2022 09.43 | | Designed by Stefa | n Gandler | MILLO |
| Eile NICEI | 2/2022 0 9. 45 | Madal | Charled by Stera | II Ganarer | Drainage |
| FILE NLGE | ? Stormwater | Model | Спескеа ву | | |
| Innovyze | | | Network 2020.1.3 | | |
| 1.0.0 | | 1.0 | | | |
| <u>100 year</u> | Return Perio | od Summary | of Critical Result | ts by Maximum L | evel (Rank |
| | | <u> </u> | for Catchment 7 | | |
| | | | | | |
| | | 24 | mulation Critoria | | |
| | Areal Reduct | ion Factor | 1.000 Additional Flo | ow - % of Total Fl | ow 0.000 |
| | Hot St | cart (mins) | 0 MADD Facto | or * 10m³/ha Stora | ge 2.000 |
| | Hot Start | Level (mm) | 0 | Inlet Coeffiecie | nt 0.800 |
| Manhol | e Headloss Coe: | ff (Global) | 0.500 Flow per Person | per Day (l/per/da | y) 0.000 |
| Foul | Sewage per he | ctare (l/s) | 0.000 | | |
| | Number of T | nnut Uudroar | appe 0 Number of Stor | and Structures 2 | |
| | Number of | Online Cont | rols 2 Number of Time | Area Diagrams 0 | |
| | Number of | Offline Cont | rols 0 Number of Real | Time Controls 0 | |
| | | | | | |
| | | Synthe | tic Rainfall Details | | |
| | F | ainfall Mode | -1 | FEH | |
| | FEH Rai | nfall Versic | n - CD 496300 413400 CE | 1999 | |
| | | Site Locatio | N GB 486200 413400 SE | -0 025 | |
| | | D1 (1km | 1) | 0.330 | |
| | | D2 (1km | n) | 0.312 | |
| | | D3 (1km | 1) | 0.298 | |
| | | E (1km | 1) | 0.300 | |
| | | F (1km | 1) | 2.451 | |
| | | Cv (Summer | | 0.750 | |
| | | CV (WINCEI |) | 0.040 | |
| | Margin for Flo | od Risk Warn | ing (mm) | 300. | 0 |
| | | Analysis | Timestep 2.5 Second I | increment (Extended | 1) |
| | | DI | 'S Status | OF | 'F |
| | | DV | D Status | C |)N |
| | | Inerti | a Status | | 7IN |
| | | | | | |
| | | Profile(s) | | Summer and Winte | er |
| | Duration | (s) (mins) 1 | 5, 30, 60, 120, 240, | 360, 480, 960, 144 | 0 |
| | Return Period | s) (years) | | 1, 30, 10 | 0 |
| | Climate | Change (%) | | 0,40,4 | 0 |
| | | | | | |
| WARNI | NG: Half Drain | Time has not | been calculated as t | he structure is to | o full. |
| | | | | | |
| | | | | | |
| | /> | Botumn Cli | noto Finat (V) Finat | (V) First (7) Orac | Water |
| PN Na | ame Storm | Period Cha | nge Surcharge Floo | d Overflow Ac | t. (m) |
| | ine beorn | reriou cha | inge burcharge 1100 | a overriow Ac | |
| S1.000 | S1 15 Winter | 100 · | +40% | | 3.743 |
| S1.001 | S2 15 Winter | : 100 · | +40% | | 3.556 |
| S1.002 | S2 15 Winter | 100 · | +40% | | 3.375 |
| S1.003 | S4 15 Winter | - 100 · | +4U% +10% | | 3.303 |
| S1.004 | S4 15 Winter | | +40% | | 3.14Z 2.944 |
| s1.006 | S6 15 Winter | 100 · | +40% | | 2.730 |
| S1.007 | S3 1440 Winter | r 100 · | +40% | | 2.551 |
| | | @1 ^ / | 22 - 2020 Theorem | | |
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| BuroHappold Ltd | | Page 17 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.257 | 0.000 | 0.47 | | | 1991.5 | FLOOD RISK* | |
| S1.001 | S2 | -0.434 | 0.000 | 0.31 | | | 2004.2 | OK | |
| S1.002 | S2 | -0.125 | 0.000 | 0.77 | | | 2023.5 | FLOOD RISK* | |
| S1.003 | S4 | -0.197 | 0.000 | 0.55 | | | 2016.0 | FLOOD RISK* | |
| S1.004 | S4 | -0.358 | 0.000 | 0.37 | | | 2014.4 | OK | |
| S1.005 | S4 | -0.056 | 0.000 | 0.82 | | | 1980.1 | FLOOD RISK* | |
| S1.006 | S6 | -0.354 | 0.000 | 0.38 | | | 1963.1 | OK | |
| S1.007 | S3 | -0.198 | 0.000 | 0.04 | | | 145.3 | FLOOD RISK* | |

| BuroHappold Ltd | | Page 18 |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| | | | | | | | () | | | | | Water |
|--------|-------|------|--------|--------|---------|--------|--------|-------|-----|-----------|----------|-------|
| | US/MH | | | Return | Climate | First | : (X) | First | (Y) | First (Z) | Overflow | Level |
| PN | Name | St | corm | Period | Change | Surch | harge | Floo | bd | Overflow | Act. | (m) |
| s2.000 | S4 | 15 | Winter | 100 | +40% | | | | | | | 3.930 |
| S2.001 | S5 | 15 | Winter | 100 | +40% | | | | | | | 3.768 |
| S2.002 | S10 | 15 | Winter | 100 | +40% | | | | | | | 3.674 |
| S2.003 | S6 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | 3.537 |
| S2.004 | S13 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | 3.374 |
| S2.005 | S12 | 15 | Winter | 100 | +40% | 100/15 | Winter | | | | | 3.199 |
| S2.006 | S15 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | 2.976 |
| S2.007 | S7 | 15 | Winter | 100 | +40% | 100/15 | Summer | | | | | 2.775 |
| S2.008 | S17 | 1440 | Winter | 100 | +40% | | | | | | | 2.504 |
| S2.009 | S8 | 1440 | Winter | 100 | +40% | | | | | | | 2.504 |
| S1.008 | S5 | 1440 | Winter | 100 | +40% | | | | | | | 2.504 |
| S1.009 | S20 | 1440 | Winter | 100 | +40% | | | | | | | 2.078 |
| S3.000 | S11 | 15 | Winter | 100 | +40% | | | | | | | 4.633 |
| S3.001 | S18 | 15 | Winter | 100 | +40% | | | | | | | 4.587 |
| S3.002 | S12 | 15 | Winter | 100 | +40% | | | | | | | 4.539 |
| S3.003 | S23 | 15 | Winter | 100 | +40% | 30/15 | Summer | | | | | 4.506 |
| S3.004 | S13 | 15 | Winter | 100 | +40% | 30/15 | Summer | | | | | 4.354 |
| S3.005 | S14 | 15 | Winter | 100 | +40% | 30/15 | Summer | | | | | 3.724 |
| S3.006 | S25 | 15 | Winter | 100 | +40% | | | | | | | 2.368 |
| S3.007 | S22 | 1440 | Winter | 100 | +40% | | | | | | | 2.101 |
| S3.008 | S15 | 1440 | Winter | 100 | +40% | | | | | | | 2.082 |
| S1.010 | S6 | 1440 | Winter | 100 | +40% | | | | | | | 2.074 |

| | | Surcharged | Flooded | | | Half Drain | Pipe | | | | | |
|--------|---------------------|------------|---------|--------|----------|------------|-------|-------------|----------|--|--|--|
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level | | | |
| PN | Name | (m) | (m³) | Cap. | (l/s) | (mins) | (l/s) | Status | Exceeded | | | |
| | | | | | | | | | | | | |
| S2.000 | S4 | -0.470 | 0.000 | 0.24 | | | 151.2 | OK | | | | |
| S2.001 | S5 | -0.272 | 0.000 | 0.57 | | | 364.6 | OK | | | | |
| S2.002 | S10 | -0.017 | 0.000 | 0.75 | | | 472.1 | OK | | | | |
| S2.003 | S6 | 0.152 | 0.000 | 1.11 | | | 563.9 | SURCHARGED | | | | |
| S2.004 | S13 | 0.116 | 0.000 | 1.14 | | | 581.7 | SURCHARGED | | | | |
| S2.005 | S12 | 0.048 | 0.000 | 0.93 | | | 578.6 | SURCHARGED | | | | |
| S2.006 | S15 | 0.105 | 0.000 | 0.98 | | | 587.7 | SURCHARGED | | | | |
| S2.007 | S7 | 0.109 | 0.000 | 1.32 | | | 608.3 | SURCHARGED | | | | |
| S2.008 | S17 | -0.396 | 0.000 | 0.01 | | | 35.9 | OK | | | | |
| S2.009 | S8 | -0.141 | 0.000 | 0.01 | | | 34.8 | FLOOD RISK* | | | | |
| S1.008 | S5 | -0.045 | 0.000 | 0.00 | | | 12.9 | FLOOD RISK* | | | | |
| S1.009 | S20 | -0.306 | 0.000 | 0.00 | | | 13.2 | OK | | | | |
| S3.000 | S11 | -0.467 | 0.000 | 0.06 | | | 207.3 | OK | | | | |
| S3.001 | S18 | -0.513 | 0.000 | 0.07 | | | 631.2 | OK | | | | |
| S3.002 | S12 | -0.561 | 0.000 | 0.03 | | | 519.0 | OK | | | | |
| S3.003 | S23 | 0.651 | 0.000 | 1.12 | | | 546.1 | SURCHARGED* | | | | |
| S3.004 | S13 | 0.756 | 0.000 | 1.47 | | | 635.5 | SURCHARGED | | | | |
| S3.005 | S14 | 0.422 | 0.000 | 2.16 | | | 693.9 | SURCHARGED | | | | |
| S3.006 | S25 | -1.532 | 0.000 | 0.03 | | | 770.9 | OK | | | | |
| S3.007 | S22 | -0.200 | 0.000 | 0.04 | | | 96.7 | FLOOD RISK* | | | | |
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| BuroHappold Ltd | | Page 19 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
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| Date 21/02/2022 09:43 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
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| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S3.008 | S15 | -0.272 | 0.000 | 0.01 | | | 91.1 | FLOOD RISK* | |
| S1.010 | S6 | -0.136 | 0.000 | 0.00 | | | 23.3 | FLOOD RISK* | |

| BuroHa | appold | l Ltd | | | | | | | | | | Pa | ge 1 | |
|--------------------|------------|---------------|----------------|---------|--------|----------------------------|---------------|---------------|--------------------|-------------|----------------|--------------|--------------------|--------|
| Camde | n Mill | | | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | | | | |
| Bath | | | | | | | 1 1. | 010 | | 17 . | | M | icro | |
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| Tnnov | WZQ | SCOLIN | water | Model | •••• | Networ | u by | 20 1 3 | 2 | | | | | _ |
| | уле | | | | | Networ | K 202 | 20.1.3 | , | | | | | |
| | | STOR | RM SEW | VER DES | IGN b | y the | Modi | fied H | Ratio | nal M | letho | d | | |
| | | | | | | | | | | | | | | |
| | | | Ne | etwork | Desig | n Tabl | e fo | r Cato | chmen [.] | t 8 | | | | |
| | | | | « – I | ndicat | es pipe | capa | citv < | flow | | | | | |
| | | | | | | - 1 1 - | - 1 | 1 | | | | | | |
| PN | Length | Fall | Slope | T Area | тк | Ba | 80 | k | n | нур | ΔΤΑ | Secti | on Type | Auto |
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow | (l/s) | (mm) | | SECI | (mm) | 50001 | on Type | Design |
| S1 000 | 62 656 | 0 313 | 200 0 | 0 519 | 5 00 |) | 0 0 | | 0 035 | 3 \- | / 500 | 1. | 3 Gwalo | |
| \$1.000 \$1.001 | 58.320 | 0.292 | 199.7 | 0.319 | 0.00 |) | 0.0 | | 0.035 | 3 \= | / 500 | 1: | 3 Swale 3 Swale | |
| S1.002 | 74.232 | 0.371 | 200.1 | 0.200 | 0.00 |) | 0.0 | | 0.035 | 3 \= | / 500 | 1: | 3 Swale | l |
| S1.003 | 50.857 | 0.254 | 200.2 | 0.244 | 0.00 |) | 0.0 | | 0.035 | 3 \= | / 500 | 1: | 3 Swale | ļ |
| S1.004 | 50.857 | 0.203 | 250.0 | 0.000 | 0.00 |) | 0.0 | 0.600 | | (| o 750 | Pipe/ | Conduit | |
| S1.005 | 19.021 | 0.076 | 250.0 | 0.079 | 0.00 |) | 0.0 | 0.600 | | • | 5 750 5 750 | Pipe/ | Conduit | |
| S1.000 | 19.847 | 0.136 | 145.9 | 0.570 | 0.00 | ,) | 0.0 | 0.000 | 0.035 | 3 \= | / 500 | 1: | 3 Swale | Ä |
| | | | | | | | | | | | | | | - T |
| | | | | 1 | Jetwoi | k Res | ults | Table | _ | | | | | |
| | | | | | | | _ | | | _ 1 | | ~ | | |
| | PN I (m | Rain m/hr) | T.C. (mins) | (m) | (ha) | Flow | Base (1/s) | Foul (1/s) | Add 1 (1/ | rlow (s) | vei (m/s) | Cap (1/s) | Flow (1/s) | |
| S1 | .000 | 50.00 | 7.43 | 3.400 | 0.51 | .9 | 0.0 | 0.0 |) | 0.0 | 0.43 | 61.3« | 70.3 | |
| S1 | .001 | 50.00 | 9.68 | 3.087 | 0.97 | 1 | 0.0 | 0.0 |) | 0.0 | 0.43 | 61.4« | 131.4 | |
| S1 | .002 | 50.00 | 12.56 | 2.795 | 1.17 | 1 | 0.0 | 0.0 |) | 0.0 | 0.43 | 61.3« | 158.5 | |
| S1 | .003 | 50.00 | 14.53 | 2.424 | 1.41 | .4 | 0.0 | 0.0 |) | 0.0 | 0.43 | 61.3« | 191.5 | |
| SI S1 | .004 | 50.00 | 15.01 15.19 | 2.1/0 | 1.41 | .4 | 0.0 | |) | 0.0 | 1.// 1.77 | 779.9 | 191.5 202 3 | |
| S1 | .005 | 50.00 | 15.24 | 1.891 | 1.49 | 4 | 0.0 | 0.0 | ,) | 0.0 | 6.27 | 2770.1 | 202.3 | |
| S1 | .007 | 50.00 | 15.89 | 0.950 | 2.06 | 3 | 0.0 | 0.0 |) | 0.0 | 0.50 | 71.8« | 279.4 | |
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| BuroHappold 1 | Ltd | | | | | Page 2 | | | | | |
|----------------------|--------------------|-----------------|----------|------------------|-------------|---------------|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | |
| Lower Bristo | l Road | | | | | | | | | | |
| Bath | | | | | | Micco | | | | | |
| $D_{ate} = 21/02/20$ | 122 09.11 | Design | od bi | , Stofan | Candler | | | | | | |
| | JZZ UJ.44 | l Chasha | | y Steran | Ganater | Drainage | | | | | |
| File NLGEP St | cormwater Mode. | I Checke | d by | | | | | | | | |
| Innovyze | | Networ | k 202 | 20.1.3 | | | | | | | |
| | | | | | | | | | | | |
| | Are | ea Summary fo | or Ca | tchment 8 | 3 | | | | | | |
| | | | | | | | | | | | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total | | | | | |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) | | | | | |
| 1 000 | Cleasification | Crease | 20 | 0 027 | 0 011 | 0 011 | | | | | |
| 1.000 | Classification | Grass | 30 | 0.037 | 0.011 | 0.011 | | | | | |
| | Classification | Grass | 30 | 0.092 | 0.430 | 0.491 | | | | | |
| 1.001 | Classification | Grass | 30 | 0.041 | 0.012 | 0.012 | | | | | |
| | Classification | Roof | 90 | 0.488 | 0.439 | 0.452 | | | | | |
| 1.002 | Classification | Roof | 90 | 0.053 | 0.047 | 0.047 | | | | | |
| | Classification | Roof | 90 | 0.008 | 0.007 | 0.054 | | | | | |
| | Classification | Road | 75 | 0.066 | 0.050 | 0.104 | | | | | |
| | Classification | Grass | 30 | 0.037 | 0.011 | 0.115 | | | | | |
| | Classification | Grass | 30 | 0.180 | 0.054 | 0.169 | | | | | |
| | Classification | Roof | 90 | 0.011 | 0.010 | 0.179 | | | | | |
| 1 002 | Classification | Grass | 30 | 0.071 | 0.021 | 0.200 | | | | | |
| 1.003 | Classification | ROOL | 90 75 | 0.179 | 0.101 | 0.101 | | | | | |
| | Classification | Grass | 30 | 0.035 | 0.027 | 0.199 | | | | | |
| | Classification | Grass | 30 | 0.060 | 0.018 | 0.217 | | | | | |
| | Classification | Grass | 30 | 0.089 | 0.027 | 0.244 | | | | | |
| 1.004 | - | - | 100 | 0.000 | 0.000 | 0.000 | | | | | |
| 1.005 | Classification | Road | 75 | 0.066 | 0.050 | 0.050 | | | | | |
| | Classification | Grass | 30 | 0.023 | 0.007 | 0.057 | | | | | |
| | Classification | Grass | 30 | 0.032 | 0.010 | 0.066 | | | | | |
| | Classification | Grass | 30 | 0.042 | 0.013 | 0.079 | | | | | |
| 1.006 | - | - | 100 | 0.000 | 0.000 | 0.000 | | | | | |
| 1.007 | Classification D | etention Basin | 100 | 0.161 | 0.161 | 0.161 | | | | | |
| | Classification | Road | 30 | 0.291 | 0.219 | 0.380 | | | | | |
| | Classification | Grass | 30 | 0.140 | 0.044 | 0.436 | | | | | |
| | Classification | Grass | 30 | 0.446 | 0.134 | 0.570 | | | | | |
| | 010001110001000 | 01000 | 00 | Total | Total | Total | | | | | |
| | | | | 3.267 | 2.063 | 2.063 | | | | | |
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| | Simula | tion Criteri | a for | Catchme | nt 8 | | | | | | |
| | | | | | | | | | | | |
| V | olumetric Runoff | Coeff 0.750 | Additi | lonal Flow | - % of Tot | al Flow 0.000 | | | | | |
| i | Areal Reduction F | actor 1.000 | MA | ADD Factor | * 10m³/ha | Storage 2.000 | | | | | |
| | Hot Start (| mins) O | |] | Inlet Coeff | iecient 0.800 | | | | | |
| | Hot Start Level | (mm) 0 Fl | ow per | Person pe | er Day (l/p | er/day) 0.000 | | | | | |
| Manhole He | eadloss Coeff (Gl | obal) 0.500 | | | Run Time | e (mins) 60 | | | | | |
| Foul Ser | wage per hectare | (l/s) 0.000 | | Outpu | ut Interval | . (mins) 1 | | | | | |
| | Number of Transfer | | T 1 | - F O b | | 1 | | | | | |
| | Number of Input I | nyurographs U N | unnber | of Time /" | e Suructur | es ⊥ me O | | | | | |
| | Number of Offlin | ne Controls (N | Jumber | of Real T | ime Contro | | | | | | |
| | | | . anwer | JI NCUI I | | | | | | | |
| | C. | unthetic Pair | ufall | Detaile | | | | | | | |
| | <u> </u> | YNCHCULC NAIL | iratt | DCCAIIS | | | | | | | |
| | | Dainfal | 1 Mad | | | | | | | | |
| | | Return Period | (vear | ст гын s) 100 | | | | | | | |
| | | FEH Rainfall | Versi | on 1999 | | | | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | |
| Date $21/02/2022$ 09.14 | Designed by Stefan Gandler | |
| Eile NICED Charmyster Medel | Charled by Steran Ganarer | Drainage |
| File NLGEP Stormwater Model | Network 2020 1 2 | |
| Innovyze | Network 2020.1.3 | |
| Synthet | ic Rainfall Details | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | |
| C (1k | m) -0.025 | |
| D1 (1k | m) 0.330 | |
| D2 (1k | m) 0.312 | |
| D3 (1k | m) 0.298 | |
| E (1k | m) 0.300 | |
| F (1k | m) 2.451 | |
| Summer Stor | ms Yes | |
| Winter Stor | ms 1es | |
| Cv (Summe | (1) $(1,5)$ | |
| Storm Duration (min | s) 30 | |
| | -, | |
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| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | Micro | | | | | | | | | |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamage | | | | | | | | | |
| Innovyze | Network 2020.1.3 | 1 | | | | | | | | | |
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| Online Cor | ntrols for Catchment 8 | | | | | | | | | | |
| | | | | | | | | | | | |
| Orifice Manhole: S5, | DS/PN: S1.007, Volume (m ³): 7.9 | | | | | | | | | | |
| | | | | | | | | | | | |
| Diameter (m) 0.042 Discharge | e Coefficient 0.600 Invert Level (m) 0. | 950 | | | | | | | | | |
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| Camden Mill | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | |
| Bath | | Micco | | | | | | | | |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamaye | | | | | | | | |
| Innovyze | Network 2020.1.3 | | | | | | | | | |
| Storage Str | uctures for Catchment 8 | | | | | | | | | |
| Infiltration Basin Manhole: S5, DS/PN: S1.007 | | | | | | | | | | |
| Inver Infiltration Coefficient Infiltration Coefficient | Invert Level (m) 0.950 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.00000 | | | | | | | | | |
| Depth (m) Are | ea (m²) Depth (m) Area (m²) | | | | | | | | | |
| 0.000 | 1043.8 1.500 1622.8 | | | | | | | | | |
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|-------------------|-------------------------|-------------------------|------------------------------|----------------|---|--------------|--|--|--|--|--|
| Camder | n Mill | | | | | | | | | | |
| Lower | Bristo | ol Road | | | | | | | | | |
| Bath | | | | | | Micro | | | | | |
| Date 2 | 21/02/2 | 2022 09:44 | | D | esigned by Stefan Gandler | Dcainago | | | | | |
| File N | NLGEP S | Stormwater | Model | . C | hecked by | Diamage | | | | | |
| Innovy | ze | | | N | etwork 2020.1.3 | | | | | | |
| | | | | | | | | | | | |
| <u>1 yea</u> | ır Retu | rn Period | Summary o | of C | ritical Results by Maximum Leve | 1 (Rank 1) | | | | | |
| | tor Catchment 8 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | : | Simul | lation Criteria | | | | | | |
| | | Areal Redu | ction Factor | 1.0 | 000 Additional Flow - % of Total Flo | ow 0.000 w | | | | | |
| | | Hot | Start (mins) | | 0 MADD Factor * 10m ³ /ha Storag | ge 2.000 | | | | | |
| м | anhole 1 | Hot Star Headloss Co | t Level (mm) eff (Global) | 0 5 | U Inlet Coefficcier | t 0.800 | | | | | |
| | Foul Se | ewage per h | ectare (l/s) | 0.0 | 000 | , | | | | | |
| | | | | | | | | | | | |
| | | Number of | Input Hydro | graph | hs 0 Number of Storage Structures 1 | | | | | | |
| | | Number of | Offline Co | ntro. ntroi | IS I Number of Real Time Controls 0 | | | | | | |
| | | | | | | | | | | | |
| | | | Synt | heti | c Rainfall Details | | | | | | |
| | | FEH Ra | Rainfall Mo Ainfall Vers | del ion | ЕН 1999 | | | | | | |
| | | | Site Locat | ion | GB 486200 413400 SE 86200 13400 | | | | | | |
| | | | C (1 | km) | -0.025 | | | | | | |
| | | | D1 (1 | km) | 0.330 | | | | | | |
| | | | D2 (1 | km) km) | 0.312 | | | | | | |
| | | | E (1 | km) | 0.298 | | | | | | |
| | | | F (1 | km) | 2.451 | | | | | | |
| | Cv (Summer) 0.750 | | | | | | | | | | |
| Cv (Winter) 0.840 | | | | | | | | | | | |
| | M- | rain for F | ood Bick Wa | rnin | a (mm) 300 | 0 | | | | | |
| | 110 | igin ioi r | Analysi | s Ti | mestep 2.5 Second Increment (Extended |) | | | | | |
| | | | _ | DTS | Status OF | F | | | | | |
| | | | | DVD | Status O | N | | | | | |
| | | | Iner | tia | Status 0 | N | | | | | |
| | | | | | | | | | | | |
| | | | Profile(s) | | Summer and Winte | r | | | | | |
| | Pe | Duratio | on(s) (mins) | 15, | 30, 60, 120, 240, 360, 480, 960, 144 | 0 | | | | | |
| | Re | Climate | Change (%) | | 0. 40. 4 | 0 | | | | | |
| | | 01111100 | , enange (e, | | o, 10, 1 | • | | | | | |
| | ADDITNO . | Half Drain | Time has n | ot b | con colculated as the structure is to | o full | | | | | |
| | VARNING | nali Diali | | | een calculated as the structure is to | 0 1011. | | | | | |
| | | | | | | | | | | | |
| | | | | | | Water | | | | | |
| | US/MH | - | Return Clir | nate | First (X) First (Y) First (Z) Ov | erflow Level | | | | | |
| PŇ | Name | Storm | Period Cha | nge | Surcharge Flood Overflow | Act. (m) | | | | | |
| s1.000 | S2 | 15 Winter | 1 | +0% | | 3.558 | | | | | |
| S1.001 | S4 | 15 Winter | 1 | +0% | | 3.283 | | | | | |
| S1.002 |)02 S3 15 Winter 1 +0% | | | | | 3.001 | | | | | |
| S1.003 | .003 54 15 Winter 1 +0% | | | | | | | | | | |
| S1.004 | 55 52 | 15 Winter | ⊥ 1 | +0≷ | 100/15 Winter | 2.379 | | | | | |
| s1.006 | S3 | 15 Winter | 1 | +0% | | 2.027 | | | | | |
| S1.007 | S5 1 | 1440 Winter | 1 | +0% | | 1.360 | | | | | |
| | | | @1 | 982- | -2020 Innovyze | | | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | · |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 8</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S2 | -0.342 | 0.000 | 0.07 | | | 62.7 | OK | |
| S1.001 | S4 | -0.304 | 0.000 | 0.12 | | | 102.5 | OK | |
| S1.002 | S3 | -0.294 | 0.000 | 0.13 | | | 111.7 | FLOOD RISK* | |
| S1.003 | S4 | -0.488 | 0.000 | 0.07 | | | 123.8 | OK | |
| S1.004 | S5 | -0.541 | 0.000 | 0.17 | | | 114.2 | OK | |
| S1.005 | S2 | -0.517 | 0.000 | 0.21 | | | 114.9 | OK | |
| S1.006 | S3 | -0.614 | 0.000 | 0.08 | | | 115.1 | OK | |
| S1.007 | S5 | -1.090 | 0.000 | 0.00 | | | 2.3 | OK | |
| Canden Mill Lower Bristol Road Bath Date 21/02/2022 09:44 File NLGEP Stornwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 8 Simulation Criteria Areal Reduction Pattor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MunD Fator 10m²/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coefficients 0.800 Poul Sewage per hectare (1/a) 0.000 Number of Input Mydrographs 0 Number of Storage Structures 1 Number of Dolline Controls 1 Number of Time?/hea Diagrams 0 Number of Ofline Controls 1 Number of Time?/hea Diagrams 0 Number of Ofline Controls 1 Number of Time?/hea Diagrams 0 Number of Ofline Controls 1 Number of Real Time Controls 0 Synthetic Rainfall Details FEH Rainfall Version 1999 Ste Location Gn 48200 413400 St 8200 13400 C (1km) -0.255 D 1 (1km) 0.330 D 2 (1km) 0.430 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) D D 3 Status 0N Frofile(s) Summer and Minter D Dry Status 0N Frofile(s) Summer and Minter D Dry Status 0N Frofile(s) Summer and Minter D Wo Status 0N Frofile(s) 0, 40, 40 WARNING: Helf Drain Time has not been calculated as the structure is too full. FRANING: Helf Drain Time has not been calculated as the structure is too full. Frofile (a) 5 structure 30 +440 Si.000 S2 15 Winter 30 +440 Si.001 S2 15 Winter 30 +440 Si.003 S2 15 Winter 30 +440 Si.003 S2 15 Winter 30 +440 Si.004 S5 15 Winter 30 +440 Si.005 S2 15 Winter 30 +440 Si.007 S5 1440 Winter 30 +440 Si.007 S5 | BuroHappold Ltd | | Page 8 |
|--|--------------------------------------|--|----------------------|
| Lawer Bristol Road Bath Bath Bath Bath Pile NLGEP Stornwater Model Pesigned by Stefan Gandler Checked by Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 3 30 year Return Period Summary 0 30 Manhole Readloss Coeff (Global) 0.500 Flow per Person per Day (L/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Real TimeControls 0 Synthetic Rainfall Details Reinfall Version 1999 Site Location (BM 46200 413400 SE 86200 13400 C ((Ran) 0.330 C ((Ran) 0.330 C ((Ran) 0.330 C ((Riner) 0.840 Margin for Flod Riak Marning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DI3 Status 0 0N Thertia Status 0 N Frofile(s) (years) 1, 30, 100 Climate Change (s) 0, 400, 400 NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time has not been calculated as the structure is too full. NERVING: Relf Drain Time ha | Camden Mill | | |
| Bath Date 21/02/2022 09:44 File NLGEP Stormwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 8 Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Not Start (min) 0 MAD Flow - % of Total Flow 0.000 Fot Start factor 0 MAD Prove Tom?/n Storage 2.000 Soft Start factor 0 MAD Prove Tom?/n Storage 2.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of P (Lam) 0.332 D (Lam) 0.332 D (Lam) 0.332 D (Lam) 0.332 D (Lam) 0.330 D (Lam) 0.332 D (Lam) 0.330 D (Lam) 0.332 D (Lam) 0.300.0 Analysis Timestep 2.5 Second Increment (Extended) D DTS Status 0 ON Fortils (S) (years) 1, 30, 100 C (Limate Change (%) 0, 120, 240, 360, 480, 960, 1440 FN Name Status 0N Frofile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 S (Lam) 0.400 Nameria Change (%) 0, 400, 400 Nameria Status 0N Frofile(s) Summer and Winter Status 0N Frofile(s) Summer and Winter Nov Status 0N Frofile(s) Years) 1, 30, 100 C (Limate Change (%) 0, 400, 300.0 S (Lam) 0.30, 30, 480, 960, 1440 S (Lam) 0.30, 30, 480, 960, 1440 S (Lam) 0.400 Nameria Status 0N Frofile(s) Years) 1, 3 | Lower Bristol Road | | |
| Date 21/02/2022 09:44 Pile NLGEP Stormwater Model Designed by Stefan Gandler Checked by Detwork 2020.1.3 | Bath | | Micco |
| File NLGEP Stormwater Model Checked by Innovyze Network 2020.1.3 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) <u>for Catchment 8</u> Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Not Start (Mina) 0 MADD Factor 'lom'ha Storage 2.000 Nanhole Readloss Coeff (clohal) 0.500 Flow per Person per Day (L/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Number of Input Mydrographs 0 Number of Storage Structures 1 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Storage Structures 1 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Status 0 P (1km) 0.330 D (1km) 0.330 D (2 (km) 0.330 D (3 Number Maring (mm) 3 Number of Flow 0.400 Narqin for Flood Hisk Maring (mm) 3 Number Of Number 15, 30, 60, 120, 240, 360, 480, 960, 1440 Neturn Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 400 NARNING: Half Drain Time has not been calculated as the structure is too full. PN Name Storm Period Change Surcharge Flood Overflow Act. (m) S1.000 S2 15 Ninter 30 +400 S1.001 S2 15 Ninter 30 +400 S1.002 S2 15 Ninter 30 +400 S1.003 S2 15 Ninter 30 +400 S1.004 S5 15 Ninter 30 +400 S1.005 S2 15 Ninter 30 +400 S1.007 S5 11400 Minter 30 +400 S1.007 S5 11400 Minter 30 +400 S1.007 S5 11400 Minter 30 +400 S1.007 S5 11 | Date 21/02/2022 09:44 | Designed by Stefan Gandler | |
| Tinovyze Network 2020.1.3 Network 2020.1.3 Network 2020.1.3 Network 2020.1.3 Network 2020.1.3 Number of Summary of Critical Results by Maximum Level (Rank 1) for Catchment 8 Simulation Criteria Areal Reduction Factor 1.000 Hot Start Level (m) 0 The Coefficient 0.800 Hot Start Level (m) 0 Number of Storage 2.000 Hot Start Level (m) 0 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Storage Structures 1 Number of Online Controls 1 Number of Real Time Controls 0 Number of Online Controls 0 Number of Real Time Controls 0 Number of Online Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Model FEIR Rainfall Model C (1km) O.330 C (1km) O.330 D (1km) O.330 D (1km) O.330 D (1km) D (1km) O.330 D (1km) C (Summer) O (Status ON Nertia Status ON Nertia Status ON Nertia Status ON Nertia Status ON Variation (Status ON Variation (Status) ON Nertia Status ON Variation (Status) ON Nertia Status ON Variation (Status) ON Nertia Status ON Nertia | File NLGEP Stormwater Model | Checked by | Drainage |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment B Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor + 10m ³ /ha Storage 2.000 Hot Start level (mm) 0 0 MADD Factor + 10m ³ /ha Storage 2.000 Hot Start level (mm) 0 0 MADD Factor + 10m ³ /ha Storage 2.000 Foil Sewage per hettare (1/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Ofline Controls 1 Number of Time/Area Diagrams 0 Number of Ofline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH FEH Rainfall Version Synthetic Rainfall Details Rainfall Model FEH FEH Rainfall Version 1990 C (1km) 0.000 F (1km) Association GB 48200 413400 SE 86200 13400 C (3km) C (3km DI (1km 0.000 F (1km) Association GB 48200 413400 SE 86200 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status DYD Status ON Winter: 30, 400, 400, 400, 400 Warner Storm Feelid Change Sucharge Flood Overflow Act. (m) Number 30 +400 3 | | Network 2020 1 3 | |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 8 Simulation Criteria Areal Reduction Factor 1.000 Additional Plow - % of Total Plow 0.000 Hot Start (mins) 0 MADD Factor * 10m*/ha Storage 2.000 Hot Start level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Plow per Person per Day (L/per/day) 0.000 Foul Sewage per hectare (1/6) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 1 Number of Offline Controls 0 Number of Storage Structures 0 Synthetic Rainfall Model FBH FER Rainfall Wording 1999 Site Location GB 485200 413400 SR 85200 13400 c (1km) 0.330 D2 (1km) 0.320 D3 (1km) 0.320 D3 (1km) 0.298 B (1km) 0.300 F (1km) 2.451 CY (Kinner) 0.580 Margin for Plood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Storage Suchange Flood Overflow Act. (m) Storage Storage Suchange Flood Overflow Act. (m) Storage Storage Storage Suchange Flood Overflow Act. (m) Storage Storage Suchange Flood Overflow Act. (m) Storage Storage Such | 111100 y 2 e | Network 2020.1.5 | |
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| Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WING: Statis Surcharge PN Name Storm Period Change Surcharge Flood Overflow Act. (m) 3.717 S1.000 S2 15 Winter 30 S1.001 S4 15 Winter 30 S1.003 S4 15 Winter 30 S1.004 S5 15 Winter 30 S1.005 S2 15 Winter 30 S1.006 <t< td=""><td>Cv (Summer</td><td>) 0.750</td><td></td></t<> | Cv (Summer |) 0.750 | |
| Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Name Storm Period Change Surcharge Flood Overflow Act. (m) S1.000 S2 15 Winter 30 +40% S1.001 S4 15 Winter 30 +40% S1.003 S4 15 Winter 30 +40% S1.003 S4 15 Winter 30 +40% S1.004 S5 15 Winter 30 +40% S1.005 S2 15 Winter 30 +40% S1.005 S2 15 Winter 30 +40% S1.005 S2 15 Winter 30 +40% S1.006 S3 15 Winter 30 +40% S1.007 S5 1440 Winter 30 +40% S1.007 S5 1440 Winter 30 +40% | CV (WINCE |) 0.040 | |
| Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. S1.000 S2 15 Winter 30 +40% 3.717 S1.001 S4 15 Winter 30 +40% 3.211 S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 2.673 S1.005 S2 15 Winter 30 +40% 2.673 S1.005 S3 15 Winter 30 +40% 2.6732 S1.005 S3 15 Winter 30 +40% 2.6732 S1.005 S3 15 Winter 30 +40% 2.6732 S1.006 S3 15 Winter 30 | Margin for Flood Risk Warn | ing (mm) 300. | . 0 |
| DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) Climate Change (%) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. Water PN Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. S1.000 S2 15 Winter 30 +40% 3.489 S1.002 S3 15 Winter 30 +40% 2.643 S1.003 S4 15 Winter 30 +40% 2.678 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 2.678 S1.006 S3 15 Winter 30 +40% | Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. Water Image: VS/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$2 15 Winter 30 +40% 3.419 3.211 \$1.001 \$4 15 Winter 30 +40% 2.678 \$1.002 \$3 15 Winter 30 +40% 2.678 \$1.003 \$4 15 Winter 30 +40% 2.6732 \$1.004 \$5 15 Winter 30 +40% 2.6732 \$1.006 \$3 15 Winter 30 +40% 2.187 | DT | S Status OF | 'F |
| Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Water Water US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$2 15 Winter 30 +40% 3.489 \$1.001 \$4 15 Winter 30 +40% 3.211 \$1.002 \$3 15 Winter 30 +40% 2.843 \$1.004 \$5 15 Winter 30 +40% 2.678 \$1.006 \$3 15 Winter 30 +40% 2.187 \$1.007 \$5 1440 Winter 30 +40% 2.105 | DV | D Status C |)N |
| Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Name Storm Period Change Surcharge Flood Overflow Act. Mater S1.000 S2 15 Winter 30 +40% 3.717 S1.001 S4 15 Winter 30 +40% 3.489 S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 2.843 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 2.187 S1.006 S3 15 Winter 30 +40% 2.105 | Inerci | a status (| 710 |
| Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 1, 30, 100 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$2 15 Winter 30 +40% 3.717 \$1.001 \$4 15 Winter 30 +40% 3.211 \$1.002 \$3 15 Winter 30 +40% 3.211 \$1.003 \$4 15 Winter 30 +40% 2.643 \$1.004 \$5 15 Winter 30 +40% 2.643 \$1.005 \$2 15 Winter 30 +40% 2.678 \$1.006 | | | |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$2 15 Winter 30 +40% 3.717 \$1.001 \$4 15 Winter 30 +40% 3.211 \$1.002 \$3 15 Winter 30 +40% 3.211 \$1.003 \$4 15 Winter 30 +40% 2.678 \$1.004 \$5 15 Winter 30 +40% 2.678 \$1.005 \$2 15 Winter 30 +40% 2.187 \$1.006 \$3 15 Winter 30 +40% 2.10 | Profile(s) | Summer and Winte | er |
| Keturn Period(s) (years) 1, 30, 100 Climate Change (%) 0, 40, 40 WARNING: Half Drain Time has not been calculated as the structure is too full. WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Succharge Flood Overflow Act. (m) S1.000 S2 S1 Winter 30 +40% S1.001 S4 15 Winter 30 +40% S1.002 S3 S1 S408 S1.003 S4 S4 15 Winter 30 S408 2.678 S1.005 S2 S1 Winter S1 S0 S1.006 S3 S1 Year S1.007 S5 | Duration(s) (mins) 1 | 5, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| WARNING: Half Drain Time has not been calculated as the structure is too full.WARNING: Half Drain Time has not been calculated as the structure is too full.WaterUS/MHReturn ClimateFirst (X)First (Y)First (Z)OverflowLevelPNNameStormPeriod ChangeSurchargeFloodOverflowAct.(m)\$1.000\$215 Winter30+40%3.717\$1.001\$415 Winter30+40%3.489\$1.002\$315 Winter30+40%3.211\$1.003\$415 Winter30+40%2.843\$1.004\$515 Winter30+40%2.678\$1.005\$215 Winter30+40%2.532\$1.006\$315 Winter30+40%2.187\$1.007\$51440 Winter30+40%2.105 | Climate Change (%) | 1, 50, 10 | 10 |
| WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH PN Return Climate Storm First (X) First (Y) First (Z) Overflow Mater 1.000 S2 15 Winter 30 +40% 51.000 S2 15 Winter 30 +40% 3.717 S1.001 S4 15 Winter 30 +40% 3.489 3.211 S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 2.843 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 2.678 S1.006 S3 15 Winter 30 +40% 2.107 S1.007 S5 1440 Winter 30 +40% 2.105 | | , <u>1</u> , 1 | |
| WARNING: Half Drain Time has not been calculated as the structure is too full. Water US/MH Return Climate First (X) First (Y) First (Z) Overflow Level PN Name Storm Period Change Surcharge Flood Overflow Act. (m) S1.000 S2 15 Winter 30 +40% S1.001 S4 15 Winter 30 +40% S1.002 S3 15 Winter 30 +40% S1.003 S4 15 Winter 30 +40% S1.004 S5 15 Winter 30 +40% S1.005 S2 15 Winter 30 +40% S1.005 S2 15 Winter 30 +40% S1.006 S3 15 Winter 30 +40% S1.007 S5 1440 Winter 30 +40% S1.007 S5 1440 Winter 30 +40% S1.007 S5 1440 Winter 30 +40% | | | |
| US/MHReturnClimateFirst (X)First (Y)First (Z)OverflowMaterPNNameStormPeriodChangeSurchargeFloodOverflowAct.3.717S1.000S215 Winter30+40%3.4893.489S1.001S415 Winter30+40%3.211S1.002S315 Winter30+40%2.843S1.003S415 Winter30+40%2.843S1.004S515 Winter30+40%2.678S1.005S215 Winter30+40%2.678S1.006S315 Winter30+40%2.107S1.007S51440Winter30+40% | WARNING: Half Drain Time has not | been calculated as the structure is to | o full. |
| US/MH PNNameReturn StormClimate PeriodFirst (X) SurchargeFirst (Y) FloodFirst (Z) OverflowOverflow Act.Water Level M\$1.000\$215Winter30+40%3.717\$1.001\$415Winter30+40%3.489\$1.002\$315Winter30+40%3.211\$1.003\$415Winter30+40%2.843\$1.004\$515Winter30+40%2.678\$1.005\$215Winter30+40%2.678\$1.006\$315Winter30+40%2.107\$1.007\$51440Winter30+40%2.105 | | | |
| VS/MHNameStormReturnClimate PeriodFirst (X) SurchargeFirst (Y) FloodFirst (Z) OverflowOverflow Act.Level (m)\$1.000\$215Winter30+40%3.41%\$1.001\$415Winter30+40%3.41%\$1.002\$315Winter30+40%3.211\$1.003\$415Winter30+40%3.211\$1.004\$515Winter30+40%2.843\$1.005\$215Winter30+40%2.678\$1.006\$315Winter30+40%2.107\$1.007\$51440Winter30+40%2.105 | | | Water |
| PN Name Storm Period Change Surcharge Flood Overflow Act. (m) \$1.000 \$2 15 Winter 30 +40% 3.717 \$1.001 \$4 15 Winter 30 +40% 3.489 \$1.002 \$3 15 Winter 30 +40% 3.211 \$1.003 \$4 15 Winter 30 +40% 2.843 \$1.004 \$5 15 Winter 30 +40% 2.678 \$1.005 \$2 15 Winter 30 +40% 100/15 Winter 2.532 \$1.006 \$3 15 Winter 30 +40% 2.105 \$1.007 \$5 1440 Winter 30 +40% 2.105 | US/MH Return Climat | te First (X) First (Y) First (Z) Ov | verflow Level |
| S1.000 S2 15 Winter 30 +40% 3.717 S1.001 S4 15 Winter 30 +40% 3.489 S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 2.843 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | PN Name Storm Period Chang | e Surcharge Flood Overflow | Act. (m) |
| S1.000 S2 15 winter 30 +40% 3.489 S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 3.211 S1.004 S5 15 Winter 30 +40% 2.843 S1.005 S2 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.105 S1.007 S5 1440 Winter 30 +40% 2.105 | S1 000 S2 15 Winton 30 44 | 18 | 2 717 |
| S1.002 S3 15 Winter 30 +40% 3.211 S1.003 S4 15 Winter 30 +40% 2.843 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | S1.001 S4 15 Winter 30 +4 |)8 | 3.489 |
| S1.003 S4 15 Winter 30 +40% 2.843 S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | S1.002 S3 15 Winter 30 +4 |)% | 3.211 |
| S1.004 S5 15 Winter 30 +40% 2.678 S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | S1.003 S4 15 Winter 30 +4 |)% | 2.843 |
| S1.005 S2 15 Winter 30 +40% 100/15 Winter 2.532 S1.006 S3 15 Winter 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | S1.004 S5 15 Winter 30 +40 |)% | 2.678 |
| S1.000 S3 15 WINTER 30 +40% 2.187 S1.007 S5 1440 Winter 30 +40% 2.105 | S1.005 S2 15 Winter 30 +40 | 0% 100/15 Winter | 2.532 |
| 2.10J | S1.000 S3 IS Winter 30 +40 | ا چر | 2.187 |
| | 51.007 55 140 WINCEL 50 T40 | | 2.105 |
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| BuroHappold Ltd | | Page 9 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | · |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S2 | -0.183 | 0.000 | 0.33 | | | 277.7 | FLOOD RISK* | |
| S1.001 | S4 | -0.098 | 0.000 | 0.57 | | | 482.9 | FLOOD RISK* | |
| S1.002 | S3 | -0.084 | 0.000 | 0.60 | | | 513.8 | FLOOD RISK* | |
| S1.003 | S4 | -0.281 | 0.000 | 0.29 | | | 553.9 | FLOOD RISK* | |
| S1.004 | S5 | -0.242 | 0.000 | 0.75 | | | 497.0 | OK | |
| S1.005 | S2 | -0.185 | 0.000 | 0.92 | | | 501.7 | OK | |
| S1.006 | S3 | -0.454 | 0.000 | 0.33 | | | 500.6 | OK | |
| S1.007 | S5 | -0.345 | 0.000 | 0.00 | | | 3.9 | OK | |

| BuroHappold Ltd | | | Page 10 |
|--|---|--|--|
| Camden Mill | | | |
| Lower Bristol Ro | oad | | |
| Bath | | | Micco |
| Date 21/02/2022 | 09:44 | Designed by Stefan Gandler | |
| File NLGEP Storr | mwater Model | Checked by | Urainage |
| Innowwze | | Network 2020 1 3 | |
| тшоууге | | Network 2020.1.5 | |
| <u>100 year Retur</u> | n Period Summary <u>1)</u> | of Critical Results by Maximum L for Catchment 8 | evel (Rank |
| Area Ho Manhole Headl Foul Sewage | Sin Al Reduction Factor 7 Hot Start (mins) ot Start Level (mm) Loss Coeff (Global) (e per hectare (l/s) (| <pre>mulation Criteria 1.000 Additional Flow - % of Total Fl 0 MADD Factor * 10m³/ha Stora 0 Inlet Coeffiecie 0.500 Flow per Person per Day (l/per/da 0.000</pre> | ow 0.000 ge 2.000 nt 0.800 y) 0.000 |
| Numi Nu Nur | ber of Input Hydrogr umber of Online Cont mber of Offline Cont | aphs 0 Number of Storage Structures 1 rols 1 Number of Time/Area Diagrams 0 rols 0 Number of Real Time Controls 0 | |
| | Synthe | tic Rainfall Details | |
| | Rainfall Mode | 1 FEH | |
| | Site Locatio | n GB 486200 413400 SE 86200 13400 | |
| | C (1km | -0.025 | |
| | D1 (1km | 0.330 | |
| | D2 (1km | 0.312 | |
| | D3 (1km | 0.298 | |
| | E (1km E (1km | 0.300 0.2.451 | |
| | r (IKII Cv (Summer | () 2.451 | |
| | Cv (Winter |) 0.840 | |
| | | | |
| Margin | for Flood Risk Warn | ing (mm) 300. | .0 |
| | Analysis | Timestep 2.5 Second Increment (Extended | 1) 2 5 |
| | UI VQ | D Status (|) N |
| | Inerti | a Status (| ON |
| | | | |
|] | Profile(s) Duration(s) (mins) 1 | Summer and Winte 5, 30, 60, 120, 240, 360, 480, 960, 144 | er 40 |
| Return | Period(s) (years) | 1, 30, 10 | 00 |
| | Climate Change (%) | 0, 40, 4 | 10 |
| WARNING: Hal | f Drain Time has not | been calculated as the structure is to | bo full. |
| | | | Water |
| US/MH PN Name St | Return Climat corm Period Chang | te First (X) First (Y) First (Z) Ov e Surcharge Flood Overflow | verflow Level Act. (m) |
| S1.000 S2 15 | Winter 100 +40 | D% | 3.780 |
| S1.001 S4 15 | Winter 100 +40 |)% | 3.567 |
| S1.002 S3 15 | Winter 100 +40 | <u>ጋ</u> % | 3.293 |
| SI.003 S4 15 S1 004 S5 15 | Winter 100 ± 40 | | 2.986 |
| S1.005 S2 15 | Winter 100 +40 | 0% 100/15 Winter | 2.753 |
| S1.006 S3 1440 | Winter 100 +40 |)% | 2.396 |
| S1.007 S5 1440 | Winter 100 +40 |)% | 2.395 |
| | ©198 | 32-2020 Innovyze | |

| BuroHappold Ltd | | Page 11 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S2 | -0.120 | 0.000 | 0.49 | | | 418.4 | FLOOD RISK* | |
| S1.001 | S4 | -0.020 | 0.000 | 0.86 | | | 730.0 | FLOOD RISK* | |
| S1.002 | S3 | -0.002 | 0.000 | 0.91 | | | 776.1 | FLOOD RISK* | |
| S1.003 | S4 | -0.138 | 0.000 | 0.44 | | | 829.6 | FLOOD RISK* | |
| S1.004 | S5 | -0.004 | 0.000 | 0.91 | | | 604.1 | OK | |
| S1.005 | S2 | 0.036 | 0.000 | 1.12 | | | 606.4 | SURCHARGED | |
| S1.006 | S3 | -0.245 | 0.000 | 0.03 | | | 46.4 | OK | |
| S1.007 | S5 | -0.055 | 0.000 | 0.00 | | | 4.4 | FLOOD RISK* | |

| BuroHap | opold | Ltd | | | | | | | | | Pag | ge 1 |
|---------|----------------|-------|---------------|----------------|---------|---------------|---------|-------------------|------|-------|--------------|-------------------------------|
| Camden | Mill | | | | | | | | | | | |
| Lower E | Bristo | l Roa | d | | | | | | | | | |
| Bath | | | | | | | | | | | 8.4 | icco |
| Date 21 | 1/02/2 | 022 0 | 9.11 | | De | signed by | Stof | an Gan | dlar | | | itiu |
| | | 022 0 | J. 11 | | | signed by | DUCIU | un Gan | arcı | - | Dr | ainage |
| File NI | JGEP S | COrmw | ater | Model . | •• Cn | ескеа бу | | | | | | |
| Innovyz | ze | | | | Ne | twork 202 | 0.1.3 | | | | | |
| | | | | | | | | | | | | |
| | | STOR | M SEWI | ER DESI | GN by | the Modif | ied R | ationa | 1 Me | etho | d | |
| | | | | | _ | | | | _ | | | |
| | | | Net | twork D | esign | Table for | Catc | hment | 9 | | | |
| | | | | _ | | | | ~ 1 | | | | |
| | | | | « — Ind | dicates | pipe capac | ity < : | tlow | | | | |
| | | | | | | | | | | | | |
| PN | Length | Fall | Slope | I.Area | T.E. | Base | n | HYD | DIA | Sect | ion Ty | pe Auto |
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow (l/s) | | SECT | (mm) | | | Design |
| | | | | | | | | | | | | |
| SI.000 | 44.4/4 | 0.148 | 300.5 | 0.034 | 5.00 | 0.0 | 0.035 | 3 \=/ 3 _/ | 500 | 1 | .: 3 Swal | 1e 💾 |
| S1 002 | 44.4/4 | 0.148 | 300.5 | 0.019 | 0.00 | 0.0 | 0.035 | > \=/ 3 \=/ | 500 | 1 | | 10 – |
| S1 002 | 44 474 | 0.149 | 300.5 | 0 018 | 0.00 | 0.0 | 0.035 | $3 \setminus = /$ | 500 | 1 | | <mark>1</mark> 1e A |
| s1.004 | 51.377 | 0.171 | 300.5 | 0.020 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | .:3 Swa | le 🔒 |
| S1.005 | 51.377 | 0.171 | 300.5 | 0.023 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swa | le 🔒 |
| S1.006 | 15.196 | 0.051 | 298.0 | 0.022 | 0.00 | 0.0 | 0.035 | 0 | 300 | Pipe | /Condu: | it 🧴 |
| | | | | | | | | | | | | _ |
| S2.000 | 44.886 | 0.156 | 287.7 | 0.044 | 5.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swa | le 🌔 |
| S2.001 | 44.886 | 0.156 | 287.7 | 0.037 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swa | le 🧂 |
| S2.002 | 44.886 | 0.156 | 287.7 | 0.035 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swa | le 🔒 |
| S2.003 | 44.886 | 0.156 | 287.7 | 0.036 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | .:3 Swal | le 💾 |
| S2.004 | 51.511 | 0.179 | 287.8 | 0.039 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swa. | le 👸 |
| 52.005 | 51.511 | 0.181 | 284.6 | 0.045 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | .:3 SWa. | Te 🧧 |
| S1.007 | 8.597 | 0.043 | 200.0 | 0.037 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swal | le 🔒 |
| S1.008 | 6.842 | 0.034 | 201.2 | 0.085 | 0.00 | 0.0 | 0.035 | 3 \=/ | 500 | 1 | :3 Swal | le 🧧 |
| | | | | | | | | | | | | _ |
| | | | | Ne | etwork | Results 7 | ſable | | | | | |
| | | | | | | | | | | | | |
| PI | N Ra | ain | T.C. | US/IL Σ | I.Area | Σ Base | Foul | Add Fl | .ow | Vel | Cap | Flow |
| | (mm | l/hr) | (mins) | (m) | (ha) | Flow (l/s) | (l/s) | (1/s) |) (| m/s) | (l/s) | (1/s) |
| S1 (| 000 5 | 0 00 | 7 11 | 2 886 | 0 034 | 0 0 | 0 0 | 0 | 0 | 0 35 | 50 0 | 4 6 |
| S1.0 | 001 5 | 0.00 | 9.22 | 2.738 | 0.054 | 0.0 | 0.0 | 0 | .0 | 0.35 | 50.0 | 7.3 |
| S1.0 | 002 5 | 0.00 | 11.33 | 2.590 | 0.072 | 0.0 | 0.0 | C | .0 | 0.35 | 50.0 | 9.7 |
| S1.0 | 003 5 | 0.00 | 13.44 | 2.441 | 0.090 | 0.0 | 0.0 | C | .0 | 0.35 | 50.0 | 12.2 |
| S1.0 | 004 5 | 0.00 | 15.88 | 2.293 | 0.110 | 0.0 | 0.0 | C | .0 | 0.35 | 50.1 | 14.9 |
| S1.0 | 005 5 | 0.00 | 18.32 | 2.122 | 0.134 | 0.0 | 0.0 | C | .0 | 0.35 | 50.1 | 18.1 |
| S1.0 | 006 5 | 0.00 | 19.18 | 1.951 | 0.156 | 0.0 | 0.0 | C | .0 | 0.29 | 20.8« | 21.1 |
| | | 0 00 | 7 | 0.000 | 0.011 | <u> </u> | 0.0 | - | | 0 0 0 | | F 0 |
| S2.0 | 000 5 | 0.00 | 7.08 | 2.886 | 0.044 | 0.0 | 0.0 | 0 | .0 | 0.36 | 51.1 | 5.9 |
| S2.0 | 001 5 002 5 | 0.00 | 9.17 11 25 | 2.130 | 0.080 | 0.0 | 0.0 | 0 | | 0.36 | 51.1 51 1 | 10.9 15 7 |
| 52.0 | 002 5 003 5 | | 13 31 | 2.3/3 2 117 | 0.110 | 0.0 | 0.0 | 0 | | 0.30 | 51.1 51.1 | 13./ 20.6 |
| S2 (| 004 5 | 0.00 | 15.73 | 2.260 | 0.191 | 0.0 | 0.0 | n | .0 | 0.36 | 51 1 | 25.8 |
| S2.0 | 005 5 | 0.00 | 18.11 | 2.081 | 0.236 | 0.0 | 0.0 | 0 | .0 | 0.36 | 51.4 | 32.0 |
| | 0 | | | | | | | Ū | - | | | |
| S1.0 | 007 5 | 0.00 | 19.51 | 1.900 | 0.429 | 0.0 | 0.0 | C | .0 | 0.43 | 61.3 | 58.1 |
| S1.0 | 008 5 | 0.00 | 19.78 | 1.057 | 0.513 | 0.0 | 0.0 | C | .0 | 0.43 | 61.2« | 69.5 |
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| BuroHappold I | Ltd | | | | | Page 2 |
|---------------|-----------------------------|----------|----------|-----------|-------------|------------|
| Camden Mill | | | | | | |
| Lower Bristo | l Road | | | | | |
| Bath | | | | | | Micco |
| Date 21/02/20 | 022 09.11 | Design | od hi | , Stofan | Candler | |
| Date 21/02/20 | 022 09:44 | Design | eu by | y Stelan | Gandier | Drainage |
| FILE NLGEP ST | tormwater Model | Спеске | α ρλ | | | |
| Innovyze | | Networ | k 202 | 20.1.3 | | |
| | 7 | . | | | ` | |
| | <u>Area Sur</u> | nmary io | r Ca | tchment S | <u> </u> | |
| Pipe | дтм д д [.] | TMD | DTMD | Gross | Tmp | Pipe Total |
| Number | Type Na | ame | (%) | Area (ha) | Area (ha) | (ha) |
| Truind C1 | 1990 | | (•) | | 11200 (110) | (112) |
| 1.000 | Classification | Road | 75 | 0.034 | 0.025 | 0.025 |
| | Classification | Grass | 30 | 0.029 | 0.009 | 0.034 |
| 1.001 | Classification | Road | 75 | 0.015 | 0.012 | 0.012 |
| 1 002 | Classification | Grass | 30 | 0.027 | 0.008 | 0.019 |
| 1.002 | Classification | Grace | 70 70 | 0.014 | 0.011 | 0.011 |
| 1.003 | Classification | Road | 7.5 | 0.014 | 0.011 | 0.011 |
| 1.005 | Classification | Grass | 30 | 0.025 | 0.008 | 0.018 |
| 1.004 | Classification | Road | 75 | 0.014 | 0.010 | 0.010 |
| | Classification | Grass | 30 | 0.033 | 0.010 | 0.020 |
| 1.005 | Classification | Road | 75 | 0.017 | 0.013 | 0.013 |
| | Classification | Grass | 30 | 0.035 | 0.011 | 0.023 |
| 1.006 | Classification | Road | 75 | 0.029 | 0.022 | 0.022 |
| 2.000 | Classification | Road | 75 | 0.032 | 0.024 | 0.024 |
| | Classification | Grass | 30 | 0.013 | 0.004 | 0.028 |
| | Classification | Road | 20 | 0.010 | 0.007 | 0.035 |
| 2 001 | Classification | Poad | 30 75 | 0.029 | 0.009 | 0.044 |
| 2.001 | Classification | Grass | 30 | 0.013 | 0.007 | 0.017 |
| | Classification | Road | 75 | 0.013 | 0.010 | 0.027 |
| | Classification | Grass | 30 | 0.031 | 0.009 | 0.037 |
| 2.002 | Classification | Road | 75 | 0.014 | 0.011 | 0.011 |
| | Classification | Grass | 30 | 0.021 | 0.006 | 0.017 |
| | Classification | Road | 75 | 0.013 | 0.010 | 0.027 |
| | Classification | Grass | 30 | 0.029 | 0.009 | 0.035 |
| 2.003 | Classification | Road | 75 | 0.014 | 0.011 | 0.011 |
| | Classification | Grass | 30 | 0.021 | 0.006 | 0.017 |
| | Classification | Grass | 30 | 0.013 | 0.010 | 0.027 |
| 2.004 | Classification | Road | 75 | 0.014 | 0.011 | 0.011 |
| | Classification | Grass | 30 | 0.022 | 0.006 | 0.017 |
| | Classification | Road | 75 | 0.013 | 0.010 | 0.027 |
| | Classification | Grass | 30 | 0.039 | 0.012 | 0.039 |
| 2.005 | Classification | Road | 75 | 0.017 | 0.013 | 0.013 |
| | Classification | Grass | 30 | 0.026 | 0.008 | 0.021 |
| | Classification | Road | 75 | 0.016 | 0.012 | 0.032 |
| 1 005 | Classification | Grass | 30 | 0.044 | 0.013 | 0.045 |
| 1.007 | Classification | Koad | 72 20 | 0.019 | 0.015 | 0.015 |
| | Classification | Road | 30 75 | 0.030 | 0.009 | 0.023 |
| 1.008 | Classification Detenti | on Basin | 100 | 0.073 | 0.073 | 0.073 |
| | Classification | Grass | 30 | 0.039 | 0.012 | 0.085 |
| | | | | Total | Total | Total |
| | | | | 1.003 | 0.513 | 0.513 |
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| BuroHappold Ltd | | Page 3 |
|---------------------------------|--|-----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |
| | | |
| Simulation (| <u>Criteria for Catchment 9</u> | |
| Welumetric Bureff Cooff (| 0 750 Additional Flow - & of Total Fl | org 0 000 |
| Areal Reduction Factor 2 | 1.000 MADD Factor * 10m ³ /ha Stora | ge 2.000 |
| Hot Start (mins) | 0 Inlet Coeffiecie | nt 0.800 |
| Hot Start Level (mm) | 0 Flow per Person per Day (1/per/da | y) 0.000 |
| Foul Sewage per hectare (1/s) (| 0.000 Output Interval (min | s) 1 |
| | | -, _ |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols I Number of Time/Area Diagrams U | |
| | Toto o Namber of Real fine concrete o | |
| Synthet | ic Rainfall Details | |
| | | |
| Rainfall Mode | el FEH | |
| FEH Rainfall Versio | on 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (1kr | n) -0.025 | |
| DI (IRT D2 (IRT | n) 0.330 n) 0.312 | |
| D3 (1kr | n) 0.298 | |
| E (1kr | n) 0.300 | |
| F (IKI Summer Storr | n) 2.451 ns Yes | |
| Winter Storr | ns Yes | |
| Cv (Summe) | r) 0.750 | |
| Storm Duration (mins | s) 30 | |
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| BuroHappold Ltd | | Page 4 |
|------------------------------|---|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Drainage |
| | Network 2020 1 3 | |
| 11110 v y 20 | NCCWOIK 2020.1.5 | |
| Online Cor | ntrols for Catchment 9 | |
| | | |
| | | |
| Orifice Manhole: S15, | DS/PN: S1.008, Volume (m ³): 55.6 | 5 |
| | | |
| Diameter (m) 0.029 Discharge | e Coefficient 0.600 Invert Level (m) 1. | 057 |
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| BuroHappold Ltd | | Page 5 |
|-----------------------------|-----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Urainage |
| | Network 2020 1 3 | |
| | NCCWOIR 2020.1.5 | |
| Storage Str | uctures for Catchment 9 | |
| | | |
| Tank or Pond M | anhole: S15, DS/PN: S1.008 | |
| Inve | ert Level (m) 1.057 | |
| Depth (m) Are | ea (m²) Depth (m) Area (m²) | |
| 0.000 | 519.0 0.800 730.9 | |
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| ©198 | 32-2020 Innovyze | |

| BuroHappold Ltd | | Page 6 |
|---------------------------------|---|----------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamaye |
| Innovyze | Network 2020.1.3 | |
| | | |
| 1 year Return Period Summary of | E Critical Results by Maximum Leve | el (Rank 1) |
| <u><u>f</u></u> | or Catchment 9 | |
| | | |
| | | |
| Areal Reduction Factor | <u>mulation Criteria</u> 1 000 Additional Flow - % of Total Fl | 000 wc |
| Hot Start (mins) | 0 MADD Factor * 10m³/ha Stora | ge 2.000 |
| Hot Start Level (mm) | 0 Inlet Coefficie | nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/da | y) 0.000 |
| Foul Sewage per nectare (1/S) | 0.000 | |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols 1 Number of Time/Area Diagrams 0 | |
| Number of Offline Cont | crols 0 Number of Real Time Controls 0 | |
| Synthe | etic Rainfall Details | |
| Rainfall Mode | el FEH | |
| FEH Rainfall Versio | on 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| | -0.025 | |
| D2 (1kr | n) 0.312 | |
| D3 (1kr | n) 0.298 | |
| E (1kr | n) 0.300 | |
| F (1ki Cu (Summe) | n) 2.451 | |
| Cv (Summe Cv (Winte: | c) 0.840 | |
| | | |
| Margin for Flood Risk Warr | ning (mm) 300. | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | l) 'F' |
| ים | /D Status C | n N |
| Inert | ia Status C | N |
| | | |
| Profile(s) | Summer and Winte | r |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 0 |
| Return Period(s) (years) | 1, 30, 10 | 0 |
| Climate Change (%) | 0, 40, 4 | 0 |
| | | |
| | | Water |
| US/MH Return Climat | te First (X) First (Y) First (Z) Ove | rflow Level |
| PN Name Storm Period Chang | e Surcharge Flood Overflow A | ct. (m) |
| S1.000 S1 15 Winter 1 +0 |)% | 2.927 |
| S1.001 S2 15 Winter 1 +0 |)% | 2.788 |
| S1.002 S2 15 Winter 1 +0 |)% | 2.646 |
| S1.003 S4 15 Winter 1 +0 |)%)9 | 2.502 |
| S1.005 S4 15 Winter 1 +0 | २ °)% | 2.338 |
| S1.006 S3 30 Winter 1 +0 | 0% 30/15 Summer | 2.095 |
| S2.000 S4 15 Winter 1 +0 |)% | 2.932 |
| S2.001 S8 15 Winter 1 +0 |)%) | 2.790 |
| S2.002 So 15 Winter 1 +0 | יז } | ∠.64Z 2.494 |
| | 22 2020 Transformer | 2.171 |
| ©19 | oz-zuzu innovyze | |

| BuroHappold Ltd | | Page 7 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S1.000 | S1 | -0.309 | 0.000 | 0.01 | | | 4.3 | OK | |
| S1.001 | S2 | -0.514 | 0.000 | 0.01 | | | 6.2 | OK | |
| S1.002 | S2 | -0.698 | 0.000 | 0.00 | | | 7.6 | OK | |
| S1.003 | S4 | -0.837 | 0.000 | 0.00 | | | 8.8 | OK | |
| S1.004 | S2 | -0.856 | 0.000 | 0.00 | | | 9.8 | OK | |
| S1.005 | S4 | -1.063 | 0.000 | 0.00 | | | 10.5 | OK | |
| S1.006 | S3 | -0.156 | 0.000 | 0.47 | | | 9.7 | OK* | |
| S2.000 | S4 | -0.304 | 0.000 | 0.02 | | | 5.5 | OK | |
| S2.001 | S8 | -0.435 | 0.000 | 0.01 | | | 8.9 | OK | |
| S2.002 | S6 | -0.491 | 0.000 | 0.01 | | | 11.8 | OK | |
| S2.003 | S11 | -0.541 | 0.000 | 0.01 | | | 14.3 | OK | |

| BuroHappold Ltd | | Page 8 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| | | | | | | | | | Water |
|--------|-------|-------------|--------|---------|-----------|-----------|-----------|----------|-------|
| | US/MH | | Return | Climate | First (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | Storm | Period | Change | Surcharge | Flood | Overflow | Act. | (m) |
| aa | 95 | 15 57 . | 1 | | | | | | 0 040 |
| SZ.004 | 55 | 15 Winter | T | +0% | | | | | 2.343 |
| S2.005 | S9 | 15 Winter | 1 | +0읭 | | | | | 2.171 |
| S1.007 | S4 | 15 Winter | 1 | +0% | | | | | 2.002 |
| S1.008 | S15 | 1440 Winter | 1 | +0% | | | | | 1.276 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S2.004 | S5 | -0.605 | 0.000 | 0.01 | | | 16.5 | OK | |
| S2.005 | S9 | -0.892 | 0.000 | 0.01 | | | 18.9 | OK | |
| S1.007 | S4 | -1.285 | 0.000 | 0.00 | | | 28.5 | OK | |
| S1.008 | S15 | -0.581 | 0.000 | 0.00 | | | 0.6 | OK | |

| BuroHappold Ltd | | Page 9 |
|---------------------------------|--|-----------------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | urainage |
| | Network 2020 1 3 | |
| | NCCWOIR 2020.1.5 | |
| 30 year Beturn Period Summary o | f Critical Results by Maximum Lev | el (Rank 1) |
| f | or Catchment 9 | <u>01 (Italiii 1)</u> |
| - | <u> </u> | |
| | | |
| Si | mulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (1/per/da | v) 0.000 |
| Foul Sewage per hectare (1/s) | 0.000 | |
| | | |
| Number of Input Hydrogr | caphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols I Number of Time/Area Diagrams U | |
| | 1013 0 Number of Keat Time concrors o | |
| Synthe | etic Rainfall Details | |
| Rainfall Mode | el FEH | |
| FEH Rainfall Versio | on 1999 | |
| Site Locatio | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| | -0.025 | |
| D2 (1kr | n) 0.312 | |
| D3 (1kr | n) 0.298 | |
| E (1kr | n) 0.300 | |
| F (1kr | n) 2.451 | |
| Cv (Summer | c) 0.750 | |
| Cv (Winter | 0.840 | |
| Margin for Flood Risk War | aing (mm) 300 | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| D: | TS Status OF | `F |
| יס | 7D Status C | DN |
| Inert | la Status C | DN |
| | | |
| Profile(s) | Summer and Winte | er |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| Return Period(s) (years) | 1, 30, 10 | 00 |
| Climate Change (%) | 0, 40, 4 | 10 |
| | | |
| | | Water |
| US/MH Return Climat | e First (X) First (Y) First (Z) Over | rflow Level |
| PN Name Storm Period Chang | e Surcharge Flood Overflow A | ct. (m) |
| S1 000 S1 15 Winton 20 44 | 12 | 2 070 |
| S1.001 S2 15 Winter 30 +40 |)% | 2.850 |
| S1.002 S2 15 Winter 30 +40 |)% | 2.711 |
| S1.003 S4 15 Winter 30 +40 | 98 | 2.569 |
| S1.004 S2 15 Winter 30 +40 |)% | 2.434 |
| S1.005 S4 15 Winter 30 +40 |) % | 2.319 |
| S1.006 S3 15 Winter 30 +40 | 0% 30/15 Summer | 2.299 |
| S2.000 S4 15 Winter 30 +40 |)% | 2.991 |
| S2.001 S8 15 Winter 30 +40 | រត្ | 2.865 |
| S2.002 S0 IS WINTER 30 +40 |) S | Z./26 2 582 |
| | | 2.302 |
| ©19 | 82-2020 Innovyze | |

| BuroHappold Ltd | | Page 10 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.257 | 0.000 | 0.06 | | | 18.7 | FLOOD RISK* | |
| S1.001 | S2 | -0.452 | 0.000 | 0.03 | | | 27.3 | OK | |
| S1.002 | S2 | -0.633 | 0.000 | 0.02 | | | 33.1 | OK | |
| S1.003 | S4 | -0.770 | 0.000 | 0.01 | | | 37.6 | OK | |
| S1.004 | S2 | -0.780 | 0.000 | 0.01 | | | 41.2 | OK | |
| S1.005 | S4 | -0.941 | 0.000 | 0.01 | | | 41.0 | OK | |
| S1.006 | S 3 | 0.048 | 0.000 | 1.49 | | | 31.0 | SURCHARGED* | |
| S2.000 | S4 | -0.245 | 0.000 | 0.08 | | | 24.1 | FLOOD RISK* | |
| S2.001 | S8 | -0.360 | 0.000 | 0.06 | | | 40.4 | OK | |
| S2.002 | S6 | -0.407 | 0.000 | 0.06 | | | 52.5 | OK | |
| S2.003 | S11 | -0.453 | 0.000 | 0.05 | | | 61.8 | OK | |

| BuroHappold Ltd | | Page 11 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|---------------|-------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|-----------------------|
| S2.004 | S5 | 15 Winter | 30 | +40% | | | | | 2.434 |
| S2.005 | S9 | 15 Winter | 30 | +40% | | | | | 2.264 |
| S1.007 | S4 | 15 Winter | 30 | +40% | | | | | 2.089 |
| S1.008 | S15 | 1440 Winter | 30 | +40% | | | | | 1.653 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S2.004 | S5 | -0.514 | 0.000 | 0.05 | | | 69.9 | OK | |
| S2.005 | S9 | -0.799 | 0.000 | 0.02 | | | 78.1 | OK | |
| S1.007 | S4 | -1.198 | 0.000 | 0.01 | | | 109.6 | OK | |
| S1.008 | S15 | -0.204 | 0.000 | 0.00 | | | 1.3 | FLOOD RISK* | |

| Lower Bristol Road |
|--|
| Bath |
| Date 21/02/2022 09:44 Designed by Stefan Gandler |
| File NLGEP Stormwater Model Checked by |
| Innovyze Network 2020.1.3 |
| |
| 100 year Return Period Summary of Critical Results by Maximum Level (Rank |
| 1) for Catchment 9 |
| |
| Simulation Critoria |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 |
| Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.000 |
| Hot Start Level (mm) 0 Inlet Coefficient 0.800 |
| Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 |
| Foul Sewage per nectare (1/s) 0.000 |
| Number of Input Hydrographs 0 Number of Storage Structures 1 |
| Number of Online Controls 1 Number of Time/Area Diagrams 0 |
| Number of Offline Controls 0 Number of Real Time Controls 0 |
| Synthetic Bainfall Details |
| Rainfall Model FEH |
| FEH Rainfall Version 1999 |
| Site Location GB 486200 413400 SE 86200 13400 |
| C $(1km)$ -0.025 |
| D1 (1Km) 0.330 D2 (1km) 0.312 |
| D3 (1km) 0.298 |
| E (1km) 0.300 |
| F (1km) 2.451 |
| Cv (Summer) 0.750 $Cv (Winter) 0.840$ |
| |
| Margin for Flood Risk Warning (mm) 300.0 |
| Analysis Timestep 2.5 Second Increment (Extended) |
| DTS Status OFF |
| Inertia Status ON |
| |
| |
| $Profile(s) \qquad Summer and Winter$ |
| Return Period(s) (wars) 13, 30, 00, 120, 240, 300, 400, 900, 1440 |
| Climate Change (%) 0, 40, 40 |
| |
| Wator |
| US/MH Return Climate First (X) First (Y) First (Z) Overflow Level |
| PN Name Storm Period Change Surcharge Flood Overflow Act. (m) |
| |
| 1 S1.000 S1 15 Winter 100 +40% 3.001 S1 001 S2 15 Winter 100 $\pm40\%$ 2 974 |
| S1.002 S2 15 Winter 100 +40% 2.740 |
| S1.003 S4 15 Winter 100 +40% 2.599 |
| \$1.004 \$2 15 Winter 100 +40% 2.471 |
| S1.005 S4 15 Winter 100 +40% 2.382 S1.006 S3 15 Winter 100 +40% 2.370 |
| $S_{2.000} = S_{1.000} = S_{1$ |
| S2.001 S8 15 Winter 100 +40% 2.897 |
| S2.002 S6 15 Winter 100 +40% 2.762 |
| S2.003 S11 15 Winter 100 +40% 2.621 |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.235 | 0.000 | 0.09 | | | 28.1 | FLOOD RISK* | |
| S1.001 | S2 | -0.428 | 0.000 | 0.04 | | | 40.3 | OK | |
| S1.002 | S2 | -0.604 | 0.000 | 0.03 | | | 48.1 | OK | |
| S1.003 | S4 | -0.740 | 0.000 | 0.02 | | | 54.0 | OK | |
| S1.004 | S2 | -0.743 | 0.000 | 0.02 | | | 58.6 | OK | |
| S1.005 | S4 | -0.878 | 0.000 | 0.01 | | | 53.9 | OK | |
| S1.006 | S 3 | 0.119 | 0.000 | 1.90 | | | 39.6 | SURCHARGED* | |
| S2.000 | S4 | -0.221 | 0.000 | 0.12 | | | 36.2 | FLOOD RISK* | |
| S2.001 | S8 | -0.328 | 0.000 | 0.09 | | | 61.5 | OK | |
| S2.002 | S6 | -0.371 | 0.000 | 0.09 | | | 80.0 | OK | |
| S2.003 | S11 | -0.414 | 0.000 | 0.08 | | | 94.2 | OK | |

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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:44 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|---------------|-------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|-----------------------|
| S2.004 | S5 | 15 Winter | 100 | +40% | | | | | 2.475 |
| S2.005 | S9 | 15 Winter | 100 | +40% | | | | | 2.303 |
| S1.007 | S4 | 15 Winter | 100 | +40% | | | | | 2.130 |
| S1.008 | S15 | 1440 Winter | 100 | +40% | | | | | 1.820 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S2.004 | S5 | -0.473 | 0.000 | 0.07 | | | 106.3 | OK | |
| S2.005 | S9 | -0.760 | 0.000 | 0.03 | | | 118.3 | OK | |
| S1.007 | S4 | -1.157 | 0.000 | 0.02 | | | 160.7 | OK | |
| S1.008 | S15 | -0.037 | 0.000 | 0.00 | | | 1.5 | FLOOD RISK* | |

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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Drainage |
| Innovyze | Network 2020.1.3 | |
| | | |

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Catchment 10

« - Indicates pipe capacity < flow

| PN | Length | Fall | Slope | I.Area | T.E. | Ba | ase | k | HYD | DIA | Section Type | Auto |
|--------|--------|-------|-------|--------|--------|------|-------|-------|------|------|--------------|----------|
| | (m) | (m) | (1:X) | (ha) | (mins) | Flow | (l/s) | (mm) | SECT | (mm) | | Design |
| S1.000 | 94.136 | 0.314 | 299.8 | 0.495 | 5.00 | | 0.0 | 0.600 | 0 | 450 | Pipe/Conduit | <u>A</u> |
| S1.001 | 71.828 | 0.239 | 300.5 | 0.537 | 0.00 | | 0.0 | 0.600 | 0 | 450 | Pipe/Conduit | ŏ |
| S1.002 | 19.652 | 0.066 | 297.8 | 0.250 | 0.00 | | 0.0 | 0.600 | 0 | 450 | Pipe/Conduit | 8 |
| S1.003 | 11.322 | 0.023 | 492.3 | 0.152 | 0.00 | | 0.0 | 0.600 | 0 | 150 | Pipe/Conduit | 8 |
| S1.004 | 2.112 | 0.004 | 528.0 | 0.000 | 0.00 | | 0.0 | 0.600 | 0 | 150 | Pipe/Conduit | Ô |

Network Results Table

| PN | Rain | T.C. | US/IL | Σ I.Area | ΣΕ | Base | Foul | Add Flow | Vel | Cap | Flow |
|--------|---------|--------|-------|----------|------|-------|-------|----------|-------|-------|-------|
| | (mm/hr) | (mins) | (m) | (ha) | Flow | (l/s) | (l/s) | (l/s) | (m/s) | (l/s) | (l/s) |
| S1.000 | 50.00 | 6.34 | 4.130 | 0.495 | | 0.0 | 0.0 | 0.0 | 1.17 | 185.9 | 67.0 |
| S1.001 | 50.00 | 7.37 | 3.816 | 1.033 | | 0.0 | 0.0 | 0.0 | 1.17 | 185.7 | 139.8 |
| S1.002 | 50.00 | 7.65 | 3.577 | 1.282 | | 0.0 | 0.0 | 0.0 | 1.17 | 186.6 | 173.6 |
| S1.003 | 50.00 | 8.07 | 3.290 | 1.434 | | 0.0 | 0.0 | 0.0 | 0.45 | 7.9« | 194.1 |
| S1.004 | 50.00 | 8.15 | 3.267 | 1.434 | | 0.0 | 0.0 | 0.0 | 0.43 | 7.6« | 194.1 |

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|-------------|-------------------------------|------------------|---------|----------|----------------|----------------|---------------------------|-----------|--|--|
| Camden Mil: | 1 | | | | | | | | | |
| Lower Brist | tol Roa | ıd | | | | | | | | |
| Bath | | | | | | | | Micco | | |
| Date 21/02, | /2022 (| 9:45 | De | esign | ed by Ste | efan Gand | ler | Desinado | | |
| File NLGEP | Stormv | ater Model . | CI | necke | d by | | | Dialitage | | |
| Innovyze | | | Ne | etwor | k 2020.1 | .3 | | | | |
| | | | | | | | | | | |
| | Area Summary for Catchment 10 | | | | | | | | | |
| | | | | | | | | | | |
| | Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total | | | |
| | Number | Туре | Name | (%) | Area (ha) | Area (ha) | (na) | | | |
| | 1.000 | Classification | Roof | 90 | 0.426 | 0.384 | 0.384 | | | |
| | | Classification | Grass | 30 | 0.091 | 0.027 | 0.411 | | | |
| | | Classification | Grass | 30 | 0.054 | 0.016 | 0.427 | | | |
| | | Classification | Grass | 30 | 0.086 | 0.026 | 0.453 | | | |
| | 1 001 | Classification | Road | . 75 | 0.056 | 0.042 | 0.495 | | | |
| | 1.001 | Classification | ROOI | 90 | 0.360 | 0.324 | 0.324 | | | |
| | | Classification | Grass | 30 | 0.080 | 0.024 | 0.348 | | | |
| | | Classification | Grace | 20 | 0.110 | 0.035 | 0.383 | | | |
| | | Classification | Grace | 30 30 | 0.070 | 0.023 | 0.405 | | | |
| | | Classification | Road | 75 | 0.099 | 0.074 | 0.537 | | | |
| | 1.002 | Classification | Roof | 90 | 0.063 | 0.056 | 0.056 | | | |
| | | Classification | Roof | 90 | 0.000 | 0.000 | 0.057 | | | |
| | | Classification | Roof | 90 | 0.001 | 0.001 | 0.058 | | | |
| | | Classification | Roof | 90 | 0.002 | 0.002 | 0.060 | | | |
| | | Classification | Roof | 90 | 0.010 | 0.009 | 0.069 | | | |
| | | Classification | Roof | 90 | 0.010 | 0.009 | 0.078 | | | |
| | | Classification | Road | 75 | 0.153 | 0.115 | 0.193 | | | |
| | | Classification | Grass | 30 | 0.027 | 0.008 | 0.201 | | | |
| | | Classification | Grass | 30 | 0.161 | 0.048 | 0.250 | | | |
| | 1.003 | Classification | Roof | 90 | 0.008 | 0.008 | 0.008 | | | |
| | | Classification | Grass | 30 | 0.169 | 0.051 | 0.058 | | | |
| | | Classification | Grass | 30 | 0.231 | 0.069 | 0.127 | | | |
| | | Classification | Grass | 30 | 0.035 | 0.010 | 0.138 | | | |
| | 1 004 | Classification | Grass | 30 | 0.046 | 0.014 | 0.152 | | | |
| | 1.004 | - | _ | 100 | 0.000 Totol | 0.000 Totol | 0.000 Totol | | | |
| | | | | | 10LAI 2 EE2 | 1 424 | 1 424 | | | |
| | | | | | 2.555 | 1.434 | 1.434 | | | |
| | | Simulation | n Cri | teria | for Cat | chment 10 | | | | |
| | | 01111111010101 | | 00110 | 101 040 | 011110110 10 | - | | | |
| | Volume | cric Runoff Coet | E£ 0.7 | 50 7 | Additional | Flow - % c | of Total Flo | ow 0.000 | | |
| | Areal | Reduction Factor | or 1.0 | 00 | MADD Fa | actor * 10m | 1 ³ /ha Storad | ge 2.000 | | |
| | | Hot Start (mins | 3) | 0 | | Inlet | Coeffiecier | nt 0.800 | | |
| | Hot | Start Level (mr | n) | 0 Flo | ow per Pers | son per Day | (l/per/day | 7) 0.000 | | |
| Manhole | Headlo | ss Coeff (Global | L) 0.5 | 00 | | Rur | n Time (mins | s) 60 | | |
| Foul | Sewage] | per hectare (1/s | s) 0.0 | 00 | | Output Int | erval (mins | 5) 1 | | |
| | | | _ | | | | | | | |
| | Numbe | r of Input Hydr | ograph | ns O N | umber of S | torage Str | uctures 1 | | | |
| | Num | per of Online C | ontrol | LS I N | umber of T | ime/Area D | lagrams U | | | |
| | NUME | er of Offine C | oncrol | LS U N | umper of R | eai ilme C | UNLFOIS U | | | |
| | | Crrn+1 | no+ i ~ | Dai- | fall Dot | ailc | | | | |
| | | Synth | JELIC | rain | LAII Det | alls | | | | |
| | | Rainfall 1 | Mode 1 | | | | FEH | | | |
| | R | eturn Period (ve | ears) | | | | 100 | | | |
| | 1 | FEH Rainfall Ve | rsion | | | | 1999 | | | |
| | | Site Loca | ation | GB 486 | 5200 413400 |) SE 86200 | 13400 | | | |
| | | С | (1km) | | | - | -0.025 | | | |
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| Camden Mill | | | |
| Lower Bristol Road | | | |
| Bath | | | Micro |
| Date 21/02/2022 09:45 | Designed by | Stefan Gandler | Dcainago |
| File NLGEP Stormwater Model | Checked by | | Diamage |
| Innovyze | Network 2020 | .1.3 | |
| <u>Synthet</u> Storm | ic Rainfall I D1 (1km) D2 (1km) D3 (1km) E (1km) F (1km) Summer Storms Winter Storms Cv (Summer) Cv (Winter) Duration (mins) | 0.330 0.312 0.298 0.300 2.451 Yes Yes 0.750 0.840 30 | |

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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Diamaye |
| Innovyze | Network 2020.1.3 | I |
| | | |
| Online Con | trols for Catchment 10 | |
| | | |
| Orifico Manholo, 82 | $DS/DN \cdot S1 003 Volume (m3) \cdot 3 1$ | |
| | D3/11. 51.003, Volume (m). 5.1 | |
| Diameter (m) 0.047 Discharg | e Coefficient 0.600 Invert Level (m) 3. | 290 |
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| BuroHappold Ltd | | Page 5 | | | | | | |
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| Camden Mill | | rage o | | | | | | |
| Lower Bristol Road | | | | | | | | |
| Bath | | Micco | | | | | | |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | MILLO | | | | | | |
| File NLGEP Stormwater Model | Checked by | Urainage | | | | | | |
| | Network 2020 1 3 | - | | | | | | |
| Innovyze Network 2020.1.5 | | | | | | | | |
| Storage Stru | actures for Catchment 10 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Cellular Storage | e Manhole: S2, DS/PN: S1.003 | | | | | | | |
| | | | | | | | | |
| Inver | rt Level (m) 3.290 Safety Factor 2.0 | | | | | | | |
| Infiltration Coefficient | Side (m/hr) 0.00000 Porosity 0.95 | | | | | | | |
| | | | | | | | | |
| Depth (m) Area (m ²) Inf. Are | ea (m ²) Depth (m) Area (m ²) Inf. Area (| m²) | | | | | | |
| 0.000 2334.0 | 0.0 0.611 0.0 | 0.0 | | | | | | |
| 0.610 2334.0 | 0.0 | | | | | | | |
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| BuroHappold Ltd | Page 6 | | | | | | | | | | |
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| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | Micro | | | | | | | | | | |
| Date 21/02/2022 09:45 Designed by Stefan Gandler | Desinado | | | | | | | | | | |
| File NLGEP Stormwater Model Checked by | Diamage | | | | | | | | | | |
| Innovyze Network 2020.1.3 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) | | | | | | | | | | | |
| for Catchment 10 | | | | | | | | | | | |
| | | | | | | | | | | | |
| Simulation Criteria | | | | | | | | | | | |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Fl | .ow 0.000 | | | | | | | | | | |
| Hot Start (mins) 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 | | | | | | | | | | |
| Hot Start Level (mm) 0 Inlet Coefficie | ent 0.800 | | | | | | | | | | |
| Foul Sewage per hectare (1/s) 0.000 Flow per Person per Day (1/per/da | lý) 0.000 | | | | | | | | | | |
| | | | | | | | | | | | |
| Number of Input Hydrographs 0 Number of Storage Structures 1 | | | | | | | | | | | |
| Number of Online Controls 1 Number of Time/Area Diagrams 0 | | | | | | | | | | | |
| NUMBER OF OFFICES O NUMBER OF REAL TIME CONTOES O | | | | | | | | | | | |
| Synthetic Rainfall Details | | | | | | | | | | | |
| Rainfall Model FEH | | | | | | | | | | | |
| FEH Rainfall Version 1999 | | | | | | | | | | | |
| Site Location GB 486200 413400 SE 86200 13400 | | | | | | | | | | | |
| D1 (1 km) = 0.023 | | | | | | | | | | | |
| D2 (1km) 0.312 | | | | | | | | | | | |
| D3 (1km) 0.298 | | | | | | | | | | | |
| E (1km) 0.300 | | | | | | | | | | | |
| F (1km) 2.451 | | | | | | | | | | | |
| Cv (Summer) 0.750 | | | | | | | | | | | |
| Cv (Winter) 0.840 | | | | | | | | | | | |
| Margin for Flood Risk Warning (mm) 300 | .0 | | | | | | | | | | |
| Analysis Timestep 2.5 Second Increment (Extended | d) | | | | | | | | | | |
| DTS Status OI | FF | | | | | | | | | | |
| DVD Status | NC | | | | | | | | | | |
| Inertia Status | NC | | | | | | | | | | |
| | | | | | | | | | | | |
| Profile(s) Summer and Winte | er | | | | | | | | | | |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 14 | 40 | | | | | | | | | | |
| Return Period(s) (years) 1, 30, 10 | 00 | | | | | | | | | | |
| Climate Change (%) 0, 40, 4 | 40 | | | | | | | | | | |
| | | | | | | | | | | | |
| WARNING: Half Drain Time has not been calculated as the structure is to | oo full. | | | | | | | | | | |
| | | | | | | | | | | | |
| | Water | | | | | | | | | | |
| US/MH Return Climate First (X) First (Y) First (Z) O | verflow Level | | | | | | | | | | |
| PN Name Storm Period Change Surcharge Flood Overflow | Act. (m) | | | | | | | | | | |
| S1.000 S1 15 Winter 1 +0% | 4.311 | | | | | | | | | | |
| S1.001 S2 15 Winter 1 +0% | 4.066 | | | | | | | | | | |
| S1.002 S3 15 Winter 1 +0% | 3.866 | | | | | | | | | | |
| S1.003 S2 1440 Winter 1 +0% 1/1440 Winter | 3.451 | | | | | | | | | | |
| S1.004 S5 1440 Winter 1 +0% | 3.291 | | | | | | | | | | |
| | | | | | | | | | | | |
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| @1002_2020_Taxactures | | | | | | | | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 10</u>

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | -0.269 | 0.000 | 0.32 | | | 58.7 | FLOOD RISK* | |
| S1.001 | S2 | -0.200 | 0.000 | 0.58 | | | 107.3 | OK* | |
| S1.002 | S3 | -0.161 | 0.000 | 0.73 | | | 124.1 | OK* | |
| S1.003 | S2 | 0.011 | 0.000 | 0.10 | | | 0.7 | SURCHARGED* | |
| S1.004 | S5 | -0.126 | 0.000 | 0.06 | | | 0.7 | OK* | |

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|---|---|------------------|--|--|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | Mirro | | | | | | | | | |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Desinado | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamage | | | | | | | | | |
| Innovyze | Network 2020.1.3 | 1 | | | | | | | | | |
| | | | | | | | | | | | |
| 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) | | | | | | | | | | | |
| <u><u>fc</u></u> | r Catchment 10 | | | | | | | | | | |
| | | | | | | | | | | | |
| Si | mulation Criteria | | | | | | | | | | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Flo | ow 0.000 | | | | | | | | | |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 | | | | | | | | | |
| Hot Start Level (mm) | 0 Inlet Coefficies | nt 0.800 | | | | | | | | | |
| Foul Sewage per hectare (1/s) | 0.000 flow per Person per Day (1/per/da 0.000 | <u>y</u>) 0.000 | | | | | | | | | |
| | | | | | | | | | | | |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | | | | | | | | | | |
| Number of Online Cont | rols () Number of Time/Area Diagrams () | | | | | | | | | | |
| | Lors a manufer of hear fine concrois o | | | | | | | | | | |
| Synthe | etic Rainfall Details | | | | | | | | | | |
| Rainfall Mode | EL FEH | | | | | | | | | | |
| FEH Rainiall Versio | on 1999 on GB 486200 413400 SE 86200 13400 | | | | | | | | | | |
| C (1kr | n) -0.025 | | | | | | | | | | |
| D1 (1kr | 0.330 | | | | | | | | | | |
| D2 (1kr | n) 0.312 | | | | | | | | | | |
| D3 (1kr | n) 0.298 | | | | | | | | | | |
| | 1) U.300 | | | | | | | | | | |
| r (IKI Cv (Summer | c) 0.750 | | | | | | | | | | |
| Cv (Winter | 0.840 | | | | | | | | | | |
| | | | | | | | | | | | |
| Margin for Flood Risk Warr | ning (mm) 300. Timester 2 5 Second Increment (Extended | 0 | | | | | | | | | |
| D' | S Status OF | 'F | | | | | | | | | |
| 7 | 7D Status C | DN | | | | | | | | | |
| Inert | a Status C | DN | | | | | | | | | |
| | | | | | | | | | | | |
| Profile(s) | Summer and Winte | er | | | | | | | | | |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 10 | | | | | | | | | |
| Return Period(s) (years) | 1, 30, 10 | 00 | | | | | | | | | |
| Climate Change (%) | 0,40,4 | 10 | | | | | | | | | |
| | | | | | | | | | | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | o full. | | | | | | | | | |
| | | | | | | | | | | | |
| | | Water | | | | | | | | | |
| US/MH Return Clima | te First (X) First (Y) First (Z) Ov | verflow Level | | | | | | | | | |
| PN Name Storm Period Chang | ge Surcharge Flood Overflow | Act. (m) | | | | | | | | | |
| S1.000 S1 15 Summer 30 +4 | 0% | 4.580 | | | | | | | | | |
| S1.001 S2 15 Summer 30 +4 | 08 | 4.266 | | | | | | | | | |
| S1.002 S3 15 Summer 30 +4 | 0% | 4.027 | | | | | | | | | |
| S1.003 S2 1440 Winter 30 +4 | 0% 1/1440 Winter | 3.755 | | | | | | | | | |
| S1.004 S5 1440 Winter 30 +4 | 0% | 3.318 | | | | | | | | | |
| | | | | | | | | | | | |
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| <u>@19</u> | 82-2020 Innovyze | | | | | | | | | | |
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| BuroHappold Ltd | | Page 9 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | 0.000 | 0.000 | 0.85 | | | 157.2 | FLOOD RISK* | |
| S1.001 | S2 | 0.000 | 0.000 | 1.78 | | | 331.4 | SURCHARGED* | |
| S1.002 | S 3 | 0.000 | 0.000 | 2.27 | | | 383.5 | SURCHARGED* | |
| S1.003 | S2 | 0.315 | 0.000 | 0.40 | | | 2.7 | SURCHARGED* | |
| S1.004 | S5 | -0.099 | 0.000 | 0.25 | | | 2.7 | OK* | |

| BuroHappold Ltd | | Page 10 | | | | | | | | | |
|---|--|----------------|--|--|--|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | |
| Lower Bristol Road | | | | | | | | | | | |
| Bath | | Micro | | | | | | | | | |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Desinado | | | | | | | | | |
| File NLGEP Stormwater Model | Checked by | Diamaye | | | | | | | | | |
| Innovyze | Network 2020.1.3 | | | | | | | | | | |
| | | | | | | | | | | | |
| 100 year Return Period Summary of Critical Results by Maximum Level (Rank | | | | | | | | | | | |
| 1) for Catchment 10 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Arcal Bodystion Factor 1 | Mulation Criteria | ort 0 000 | | | | | | | | | |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ae 2.000 | | | | | | | | | |
| Hot Start Level (mm) | 0 Inlet Coefficies | nt 0.800 | | | | | | | | | |
| Manhole Headloss Coeff (Global) C | .500 Flow per Person per Day (l/per/da | y) 0.000 | | | | | | | | | |
| Foul Sewage per hectare (l/s) C | .000 | | | | | | | | | | |
| Number of Input Hydrogra | aphs 0 Number of Storage Structures 1 | | | | | | | | | | |
| Number of Online Contr | cols 1 Number of Time/Area Diagrams 0 | | | | | | | | | | |
| Number of Offline Contr | cols 0 Number of Real Time Controls 0 | | | | | | | | | | |
| | tia Dainfall Detaila | | | | | | | | | | |
| Synthe Rainfall Mode | LIC KAINIALI DETALIS FEH | | | | | | | | | | |
| FEH Rainfall Version | n 1999 | | | | | | | | | | |
| Site Location | n GB 486200 413400 SE 86200 13400 | | | | | | | | | | |
| C (1km | -0.025 | | | | | | | | | | |
| DI (1km D2 (1km | 0.330 | | | | | | | | | | |
| D2 (1km D3 (1km | 0.298 | | | | | | | | | | |
| E (1km | 0.300 | | | | | | | | | | |
| F (1km | 2.451 | | | | | | | | | | |
| Cv (Summer | 0.750 | | | | | | | | | | |
| Cv (WINCEL | 0.040 | | | | | | | | | | |
| Margin for Flood Risk Warn | ing (mm) 300. | 0 | | | | | | | | | |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) | | | | | | | | | |
| | S Status OF | .F. | | | | | | | | | |
| Inertia | a Status C |)N | | | | | | | | | |
| | | | | | | | | | | | |
| | Company and Martin | | | | | | | | | | |
| Prolle(S) Duration(s) (mins) 1 | Summer and winte 5. 30. 60. 120. 240. 360. 480. 960. 144 | n o | | | | | | | | | |
| Return Period(s) (years) | 1, 30, 10 | 0 | | | | | | | | | |
| Climate Change (%) | 0, 40, 4 | 0 | | | | | | | | | |
| | | | | | | | | | | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | o full. | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | o First (V) First (V) First (F) o | Water | | | | | | | | | |
| PN Name Storm Period Change | e first (A) first (I) first (Z) OU e Surcharge Flood Overflow | Act. (m) | | | | | | | | | |
| _ | | ·/ | | | | | | | | | |
| S1.000 S1 15 Summer 100 +40 | 20 | 4.580 | | | | | | | | | |
| S1.001 S2 15 Summer 100 +40 S1.002 S3 15 Summer 100 +40 | 5° 96 | 4.266 4 027 | | | | | | | | | |
| S1.003 S2 1440 Winter 100 +40 | % 1/1440 Winter | 3.900 | | | | | | | | | |
| \$1.004 \$5 1440 Winter 100 +40 | 8 | 3.323 | | | | | | | | | |
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|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:45 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S1 | 0.000 | 0.000 | 1.12 | | | 208.0 | FLOOD RISK* | |
| S1.001 | S2 | 0.000 | 0.000 | 2.45 | | | 454.8 | SURCHARGED* | |
| S1.002 | S3 | 0.000 | 0.000 | 3.12 | | | 528.3 | SURCHARGED* | |
| S1.003 | S2 | 0.460 | 0.000 | 0.47 | | | 3.2 | SURCHARGED* | |
| S1.004 | S5 | -0.094 | 0.000 | 0.30 | | | 3.2 | OK* | |

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|--|------|--------------|-------------|---------------------|----------------|---------------|--------------|-------------------|-------------|----------------|------------|--------------|-------------|---------|--------|----------------|
| Camde | en l | Mill | | | | | | | | | | | | | | |
| Lower | r Bi | rist | ol Ro | ad | | | | | | | | | | | - | |
| Bath | | | | | | | | | | | | | | Mi | irro | |
| Date | 21, | /02/ | 2022 | 09:15 | | | Des | igned b | y S | tefa | n G | andle | r | | | |
| File NLGEP Stormwater Model Checked by | | | | | | | | | | | Je | | | | | |
| Innov | vyze | e | | | | | Net | work 20 | 20. | 1.3 | | | | 1 | | |
| | | | STOP | RM SEV <u>Ne</u> | NER DES | IGN Desi | oy t gn I | the Modi | fie or C | ed Ra Catch | tio men | nal M t 1 | lethoo | 1 | | |
| PN | Le | ength (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins | ;) F] | Base Low (l/s) | k (mr | n) | n | HYD SECT | DIA (mm) | Section | п Туре | Auto Design |
| S1.004 | 4 38 | 3.148 | 0.254 | 150.2 | 0.054 | 0.0 | 0 | 0.0 | I | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | |
| S1.00 | 5 43 | 8.914 | 1.300 | 33.8 | 0.000 | 0.0 | 00 | 0.0 | | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | ě |
| S5.00 | 0 30 | .364 | 0.214 | 141.9 | 0.169 | 5.0 | 0 | 0.0 | | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | . 🔶 . |
| S5.00 | 1 25 | 653 | 0.181 | 141.7 | 0.168 | 0.0 | 0 | 0.0 | | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | - |
| \$5.002 | 2 19 | 9.998 | 1.300 | 15.4 | 0.000 | 0.0 | 0 | 0.0 | | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | • |
| S1.00 | 6 52 | 2.554 | 0.263 | 199.8 | 0.204 | 0.0 | 00 | 0.0 | | 0.0 | 035 | 3 \=/ | 500 | 1:3 | Swale | • |
| | | | | | 1 | Netwo | rk i | Results | Tal | ble | | | | | | |
| | PN | F | Rain | т.с. | US/IL | ΣΙ.4 | rea | Σ Base | | Foul | Add | Flow | Vel | Cap | Flow | |
| | | (m | m/hr) | (mins) | (m) | (ha | .) | Flow (1/ | s) (| (1/s) | (1 | L/s) | (m/s) | (1/s) | (1/s) | |
| S | 1.00 | 4 | 50.00 | 11.48 | 1.421 | 0. | 513 | 0 | .0 | 0.0 | | 0.0 | 0.50 | 70.8 | 69.4 | |
| S | 1.00 | 5 | 50.00 | 12.18 | 1.166 | 0. | 513 | 0 | .0 | 0.0 | | 0.0 | 1.05 | 149.3 | 69.4 | |
| S | 5 00 | 0 | 50 00 | 599 | 1 560 | 0 | 169 | 0 | 0 | 0 0 | | 0 0 | 0 51 | 72 8 | 22 9 | |
| S | 5.00 | 1 | 50.00 | 6.83 | 1.346 | 0. | 337 | 0 | .0 | 0.0 | | 0.0 | 0.51 | 72.9 | 45.6 | |
| S | 5.00 | 2 | 50.00 | 7.04 | 1.166 | 0. | 337 | 0 | .0 | 0.0 | | 0.0 | 1.55 | 221.2 | 45.6 | |
| S | 1.00 | 6 | 50.00 | 14.21 | -0.134 | 1. | 053 | 0 | .0 | 0.0 | | 0.0 | 0.43 | 61.4« | 142.6 | |
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| BuroHappold I | Ltd | | | | | Page 3 | | | | | | |
|---------------|------------------------------|-----------------|--------------|-----------|-----------|----------------|--|--|--|--|--|--|
| Camden Mill | | | | | | | | | | | | |
| Lower Bristo | l Road | | | | | | | | | | | |
| Bath | | | | | | Micco | | | | | | |
| Date 21/02/20 | 022 09:15 | Desig | ned b | v Stefan | Gandler | | | | | | | |
| File NLGEP St | Drainage | | | | | | | | | | | |
| Innovyze | | | | | | | | | | | | |
| 11110 1 / 20 | | | | | | | | | | | | |
| | Area Summary for Catchment 1 | | | | | | | | | | | |
| | | | | | _ | | | | | | | |
| Pipe | PIMP | PIMP | PIMP | Gross | Imp. | Pipe Total | | | | | | |
| Number | Туре | Name | (%) | Area (ha) | Area (ha) | (ha) | | | | | | |
| 1 000 | Classification | Boad | 75 | 0 094 | 0 071 | 0 071 | | | | | | |
| 1.000 | Classification | Grass | 30 | 0.007 | 0.002 | 0.073 | | | | | | |
| 1.001 | Classification | Road | 75 | 0.015 | 0.012 | 0.012 | | | | | | |
| | Classification | Grass | 30 | 0.010 | 0.003 | 0.015 | | | | | | |
| 1.002 | Classification | Road | 75 | 0.007 | 0.005 | 0.005 | | | | | | |
| | Classification | Grass | 30 | 0.008 | 0.002 | 0.008 | | | | | | |
| 2.000 | Classification | Road | 75 | 0.016 | 0.012 | 0.012 | | | | | | |
| 0.007 | Classification | Grass | 30 | 0.017 | 0.005 | 0.017 | | | | | | |
| 2.001 | Classification | Grass | 30 | 0.025 | 0.008 | 0.008 | | | | | | |
| 2.002 | Classification | Road | 20 | 0.020 | 0.015 | 0.015 | | | | | | |
| 2.003 | Classification | GLASS | 25 | 0.011 | 0.003 | 0.003 | | | | | | |
| 3.000 | Classification | Road | 75 | 0.023 | 0.053 | 0.053 | | | | | | |
| | Classification | Grass | 30 | 0.010 | 0.003 | 0.056 | | | | | | |
| 3.001 | Classification | Road | 75 | 0.034 | 0.026 | 0.026 | | | | | | |
| | Classification | Grass | 30 | 0.016 | 0.005 | 0.031 | | | | | | |
| 3.002 | Classification | Road | 75 | 0.023 | 0.017 | 0.017 | | | | | | |
| | Classification | Road | 75 | 0.009 | 0.007 | 0.024 | | | | | | |
| | Classification | Road | 75 | 0.007 | 0.006 | 0.030 | | | | | | |
| | Classification | Grass | 30 | 0.012 | 0.003 | 0.033 | | | | | | |
| 4 000 | Classification | Grass | 30 | 0.021 | 0.006 | 0.040 | | | | | | |
| 4.000 | Classification | Road | 75 | 0.074 | 0.038 | 0.056 | | | | | | |
| | Classification | Grass | 30 | 0.023 | 0.007 | 0.073 | | | | | | |
| | Classification | Grass | 30 | 0.027 | 0.008 | 0.081 | | | | | | |
| 4.001 | Classification | Road | 75 | 0.014 | 0.010 | 0.010 | | | | | | |
| | Classification | Grass | 30 | 0.027 | 0.008 | 0.019 | | | | | | |
| | Classification | Grass | 30 | 0.017 | 0.005 | 0.023 | | | | | | |
| | Classification | Road | 75 | 0.013 | 0.010 | 0.033 | | | | | | |
| 3.003 | - | - | 100 | 0.000 | 0.000 | 0.000 | | | | | | |
| 1.003 | Classification | Grass | 30 | 0.017 | 0.005 | 0.005 | | | | | | |
| 1 004 | User | | 100 | 0.056 | 0.056 | 0.061 | | | | | | |
| 1.004 | Classification | коас | - 10 - 10 | 0.060 | 0.045 | 0.045 | | | | | | |
| | Classification | Grass | 30 | 0.023 | 0.007 | 0.054 | | | | | | |
| 1.005 | - | | 100 | 0.000 | 0.000 | 0.000 | | | | | | |
| 5.000 | Classification | Roof | 90 | 0.181 | 0.163 | 0.163 | | | | | | |
| | Classification | Grass | 30 | 0.021 | 0.006 | 0.169 | | | | | | |
| 5.001 | Classification | Roof | 90 | 0.179 | 0.161 | 0.161 | | | | | | |
| | Classification | Grass | 30 | 0.022 | 0.007 | 0.168 | | | | | | |
| 5.002 | - | - | 100 | 0.000 | 0.000 | 0.000 | | | | | | |
| 1.006 | Classification | Detention Basin | 100 | 0.092 | 0.092 | 0.092 | | | | | | |
| | Classification | Grass | 30 | 0.079 | 0.024 | U.116 0.201 | | | | | | |
| | Classification | Grass | 30 | 0.284 | 0.085 | 0.201 | | | | | | |
| | JIASSIIICALION | GLASS | 50 | Total | Total | Total | | | | | | |
| | | | | 1.699 | 1.053 | 1.053 | | | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Drainago |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |
| | | |
| Simulation (| Criteria for Catchment 1 | |
| Volumetrie Duroff Cooff | 2750 Additional Eleve & of Total El | orr 0,000 |
| Areal Reduction Factor 1 | 1.000 MADD Factor * 10m ³ /ha Stora | ige 2.000 |
| Hot Start (mins) | 0 Inlet Coeffiecie | ent 0.800 |
| Hot Start Level (mm) | 0 Flow per Person per Day (1/per/da | y) 0.000 |
| Foul Sewage per hectare (1/s) (| 0.000 Output Interval (mir | ns) 1 |
| | | , 1 |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols 1 Number of Time/Area Diagrams 0 | |
| | TOTS O NUMBER OF Real TIME CONCLUSS O | |
| Synthet | ic Rainfall Details | |
| | | |
| Rainfall Mode | el FEH | |
| Return Period (year: FEH Bainfall Versio | s) 100 n 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| C (1kr | n) -0.025 | |
| D1 (1kr | n) 0.330 | |
| D3 (1kr | n) 0.298 | |
| E (1kr | n) 0.300 | |
| F (1kr | n) 2.451 | |
| Winter Storr | ns res | |
| Cv (Summe | r) 0.750 | |
| Cv (Winter | r) 0.840 | |
| Storm Duration (mins | 5) 30 | |
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|---|---|----------|--|--|--|
| Camden Mill | | | | | |
| Lower Bristol Road | | | | | |
| Bath | | Micco | | | |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | | | | |
| File NLGEP Stormwater Model | Checked by | Digiliga | | | |
| Innovyze | Network 2020.1.3 | <u> </u> | | | |
| Online Controls for Catchment 1 | | | | | |
| Urifice Mannole: 58, | DS/PN: SI.006, VOLUME (M ³): 63.9 | | | | |
| Orifice Manhole: S8, DS/PN: S1.006, Volume (m³): 63.9 Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) -0.134 | | | | | |
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|---|---|-----------|--|--|--|
| Camden Mill | | | | | |
| Lower Bristol Road | | | | | |
| Bath | | Micco | | | |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | | | | |
| File NLGEP Stormwater Model | Checked by | Dialitada | | | |
| Innovyze | Network 2020.1.3 | | | | |
| Storage Structures for Catchment 1 | | | | | |
| Infiltration Basi | in Manhole: S8, DS/PN: S1.006 | | | | |
| Inver Infiltration Coefficient Infiltration Coefficient | rt Level (m) -0.134 Safety Factor 2.0 Base (m/hr) 0.00000 Porosity 1.00 Side (m/hr) 0.00000 | | | | |
| Depth (m) Are | ea (m²) Depth (m) Area (m²) | | | | |
| 0.000 | 552.1 1.300 924.8 | | | | |
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| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Dialnage |
| Innovyze | Network 2020.1.3 | |
| | Network 2020.1.5 | |
| 1 year Return Period Summary of | Critical Results by Maximum Leve | el (Rank 1) |
| | or Catchment 1 | <u>(1.0111 1)</u> |
| - | <u> </u> | |
| | | |
| Si | mulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) Hot Start Level (mm) | 0 MADD Factor * 10m³/ha Stora | ge 2.000 nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (1/per/da | y) 0.000 |
| Foul Sewage per hectare (1/s) | 0.000 | <u>,</u> |
| | | |
| Number of Input Hydrogr | aphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | rols I Number of Time/Area Diagrams U | |
| | TOTS O NUMBER OF NEAT TIME CONCLOTS O | |
| Synthe | etic Rainfall Details | |
| Rainfall Mode | el FEH | |
| FEH Rainfall Versio | on 1999 | |
| Site Locatio | on GB 486200 413400 SE 86200 13400 | |
| D1 (1km | 0.330 | |
| D2 (1km | a) 0.312 | |
| D3 (1km | 0.298 | |
| E (1km | n) 0.300 | |
| F (1km | a) 2.451 | |
| Cv (Summer | c) 0.750 | |
| | .) 0.040 | |
| Margin for Flood Risk Warr | ing (mm) 300. | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| DI | 'S Status OF | Έ |
| D | D Status C |)N |
| Inerti | a status (| <u>1</u> N |
| | | |
| Profile(s) | Summer and Winte | er |
| Duration(s) (mins) | 5, 30, 60, 120, 240, 360, 480, 960, 144 | 0 |
| Return Period(s) (years) | | |
| | 0, 40, 4 | 0 |
| | | |
| WARNING: Half Drain Time has not | been calculated as the structure is to | o full. |
| | | |
| | | Water |
| US/MH Return Climat | e First (X) First (Y) First (Z) Ove | rflow Level |
| PN Name Storm Period Chang | e Surcharge Flood Overflow A | ct. (m) |
| | | |
| S1.000 S3 15 Winter 1 +0 | × | 2.244 |
| S1.001 S4 15 Winter 1 +(| 2 2 | 2.041 |
| S2.000 S5 15 Winter 1 +0 | 0 0 | ⊥•0/0 2.225 |
| S2.001 S5 15 Winter 1 +0 | - 8 | 2.070 |
| S2.002 S6 15 Winter 1 +0 | % 30/15 Summer | 1.879 |
| S2.003 S7 15 Winter 1 +0 | 8 | 1.826 |
| S3.000 S6 15 Winter 1 +0 | 8 | 2.248 |
| ©19 | 32-2020 Innovyze | |
| | <u> </u> | |

| BuroHappold Ltd | | Page 8 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | · |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| | | | | | | | | | |
| S1.000 | S3 | -0.456 | 0.000 | 0.01 | | | 9.5 | OK | |
| S1.001 | S4 | -0.511 | 0.000 | 0.01 | | | 11.2 | OK | |
| S1.002 | S5 | -0.557 | 0.000 | 0.01 | | | 12.1 | OK | |
| S2.000 | S5 | -0.475 | 0.000 | 0.00 | | | 2.3 | OK | |
| S2.001 | S5 | -0.630 | 0.000 | 0.00 | | | 3.0 | OK | |
| S2.002 | S6 | -0.090 | 0.000 | 0.34 | | | 4.2 | OK* | |
| S2.003 | S7 | -0.874 | 0.000 | 0.00 | | | 6.2 | OK | |
| S3.000 | S6 | -0.452 | 0.000 | 0.01 | | | 7.3 | OK | |
| BuroHappold Ltd | | Page 9 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Catchment 1</u>

| | | | | | | | | | Water |
|--------|-------|-------------|--------|---------|--------------|-----------|-----------|----------|-------|
| | US/MH | | Return | Climate | First (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | Storm | Period | Change | Surcharge | Flood | Overflow | Act. | (m) |
| S3.001 | S7 | 15 Winter | 1 | +0% | | | | | 2.155 |
| S3.002 | S8 | 15 Winter | 1 | +0% | | | | | 2.008 |
| S4.000 | S10 | 15 Winter | 1 | +0% | | | | | 2.259 |
| S4.001 | S12 | 15 Winter | 1 | +0% | | | | | 2.045 |
| S3.003 | S10 | 15 Winter | 1 | +0% | 30/15 Summer | | | | 1.880 |
| S1.003 | S7 | 15 Winter | 1 | +0% | | | | | 1.792 |
| S1.004 | S15 | 15 Winter | 1 | +0% | | | | | 1.542 |
| S1.005 | S7 | 15 Winter | 1 | +0% | | | | | 1.247 |
| S5.000 | S14 | 15 Winter | 1 | +0% | | | | | 1.639 |
| S5.001 | S15 | 15 Winter | 1 | +0% | | | | | 1.456 |
| S5.002 | S15 | 15 Winter | 1 | +0% | | | | | 1.226 |
| S1.006 | S8 | 1440 Winter | 1 | +0% | | | | | 0.229 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
| S3.001 | S7 | -0.545 | 0.000 | 0.01 | | | 10.6 | OK | |
| S3.002 | S8 | -0.692 | 0.000 | 0.01 | | | 14.7 | OK | |
| S4.000 | S10 | -0.441 | 0.000 | 0.01 | | | 10.3 | OK | |
| S4.001 | S12 | -0.655 | 0.000 | 0.01 | | | 13.6 | OK | |
| S3.003 | S10 | -0.172 | 0.000 | 0.38 | | | 24.2 | OK* | |
| S1.003 | S7 | -0.383 | 0.000 | 0.04 | | | 43.8 | OK | |
| S1.004 | S15 | -0.379 | 0.000 | 0.05 | | | 47.3 | OK | |
| S1.005 | S7 | -0.419 | 0.000 | 0.02 | | | 47.2 | OK | |
| S5.000 | S14 | -0.521 | 0.000 | 0.01 | | | 21.9 | OK | |
| S5.001 | S15 | -0.407 | 0.000 | 0.04 | | | 39.8 | OK | |
| S5.002 | S15 | -0.440 | 0.000 | 0.01 | | | 39.8 | OK | |
| S1.006 | S8 | -0.937 | 0.000 | 0.00 | | | 1.3 | OK | |

| BuroHappold Ltd | | Page 10 |
|---|---|--|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | |
| File NLGEP Stormwater Model | Checked by | Dialnage |
| | Network 2020 1 3 | |
| | NCCWOIN 2020.1.5 | |
| 30 year Return Period Summary o <u>f</u> | f Critical Results by Maximum Lev or Catchment 1 | el (Rank 1) |
| <u>Si</u> Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) Foul Sewage per hectare (l/s) | <pre>mulation Criteria 1.000 Additional Flow - % of Total Fl 0 MADD Factor * 10m³/ha Stora 0 Inlet Coeffiecie 0.500 Flow per Person per Day (l/per/da 0.000</pre> | ow 0.000 ge 2.000 nt 0.800 y) 0.000 |
| Number of Input Hydrog: Number of Online Cont Number of Offline Cont | raphs 0 Number of Storage Structures 1 crols 1 Number of Time/Area Diagrams 0 crols 0 Number of Real Time Controls 0 | |
| Synth | etic Rainfall Details | |
| Rainfall Mod | el FEH | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | |
| C (1k | m) -0.025 | |
| D1 (1k | m) 0.330 | |
| D2 (1k | m) 0.312 | |
| D3 (1k: | m) 0.298 | |
| E (1K. F (1k) | (1) 0.300 | |
| Cv (Summe | r) 0.750 | |
| Cv (Winte | r) 0.840 | |
| | | |
| Margin for Flood Risk War | ning (mm) 300. | . 0 |
| Analysis | TIMESTED 2.5 Second Increment (Extended | 1) 7F |
| D | VD Status (| DN . |
| Inert | ia Status (| DN |
| Profile(s) | Summer and Winte | er |
| Return Period(s) (vears) | 1, 30, 10 | 0 |
| Climate Change (%) | 0, 40, 4 | 10 |
| WARNING: Half Drain Time has no | t been calculated as the structure is to | oo full. |
| | | Water |
| US/MH Return Clima | te First (X) First (Y) First (Z) Ove | rflow Level |
| PN Name Storm Period Chang | e Surcharge Flood Overflow A | ct. (m) |
| S1.000 S3 15 Winter 30 +4 | 0% | 2.299 |
| S1.001 S4 15 Winter 30 +4 | 0% | 2.102 |
| S1.002 S5 15 Winter 30 +4 | 0% | 1.940 |
| S2.000 S5 15 Winter 30 +4 | 0% | 2.257 |
| S2.001 S5 15 Winter 30 +4 | Us N% 30/15 Summer | 2.110 1 997 |
| S2.002 S0 15 Winter 30 +4 | 08 09 SOLID SUMMET | 1.915 |
| S3.000 S6 15 Winter 30 +4 | 0% | 2.305 |
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| | 02 2020 IIII0VY26 | |

| BuroHappold Ltd | | Page 11 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Mirro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | • |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 1

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (1/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S3 | -0.401 | 0.000 | 0.03 | | | 41.6 | OK | |
| S1.001 | S4 | -0.450 | 0.000 | 0.03 | | | 49.7 | OK | |
| S1.002 | S5 | -0.495 | 0.000 | 0.03 | | | 54.0 | OK | |
| S2.000 | S5 | -0.443 | 0.000 | 0.01 | | | 9.7 | OK | |
| S2.001 | S5 | -0.590 | 0.000 | 0.01 | | | 13.5 | OK | |
| S2.002 | S6 | 0.018 | 0.000 | 1.23 | | | 15.5 | SURCHARGED* | |
| S2.003 | S7 | -0.785 | 0.000 | 0.01 | | | 25.0 | OK | |
| S3.000 | S6 | -0.395 | 0.000 | 0.04 | | | 31.8 | OK | |

| BuroHappold Ltd | | Page 12 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 1

| | | | | | | | | | Water |
|--------|-------|-------------|--------|---------|--------------|-----------|-----------|----------|-------|
| | US/MH | | Return | Climate | First (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | Storm | Period | Change | Surcharge | Flood | Overflow | Act. | (m) |
| S3.001 | s7 | 15 Winter | 30 | +40% | | | | | 2.227 |
| S3.002 | S8 | 15 Winter | 30 | +40% | | | | | 2.106 |
| S4.000 | S10 | 15 Winter | 30 | +40% | | | | | 2.330 |
| S4.001 | S12 | 15 Winter | 30 | +40% | | | | | 2.135 |
| S3.003 | S10 | 15 Winter | 30 | +40% | 30/15 Summer | | | | 2.074 |
| S1.003 | S7 | 15 Winter | 30 | +40% | | | | | 1.904 |
| S1.004 | S15 | 15 Winter | 30 | +40% | | | | | 1.661 |
| S1.005 | S7 | 15 Winter | 30 | +40% | | | | | 1.332 |
| S5.000 | S14 | 15 Winter | 30 | +40% | | | | | 1.733 |
| S5.001 | S15 | 15 Winter | 30 | +40% | | | | | 1.586 |
| S5.002 | S15 | 15 Winter | 30 | +40% | | | | | 1.304 |
| S1.006 | S8 | 1440 Winter | 30 | +40% | | | | | 0.878 |

| | US/MH | Surcharged Depth | Flooded Volume | Flow / | Overflow | Half Drain Time | Pipe Flow | | Level |
|--------|-------|---------------------|-------------------|--------|----------|--------------------|--------------|-------------|----------|
| PN | Name | (m) | (m³) | Cap. | (1/s) | (mins) | (l/s) | Status | Exceeded |
| S3.001 | s7 | -0.473 | 0.000 | 0.04 | | | 49.2 | OK | |
| S3.002 | S8 | -0.594 | 0.000 | 0.03 | | | 66.2 | OK | |
| S4.000 | S10 | -0.370 | 0.000 | 0.05 | | | 44.9 | OK | |
| S4.001 | S12 | -0.565 | 0.000 | 0.03 | | | 56.9 | OK | |
| S3.003 | S10 | 0.022 | 0.000 | 1.21 | | | 77.1 | SURCHARGED* | |
| S1.003 | S7 | -0.271 | 0.000 | 0.17 | | | 168.1 | FLOOD RISK* | |
| S1.004 | S15 | -0.260 | 0.000 | 0.19 | | | 185.6 | FLOOD RISK* | |
| S1.005 | S7 | -0.334 | 0.000 | 0.09 | | | 186.0 | OK | |
| S5.000 | S14 | -0.427 | 0.000 | 0.06 | | | 95.0 | OK | |
| S5.001 | S15 | -0.277 | 0.000 | 0.18 | | | 191.3 | FLOOD RISK* | |
| S5.002 | S15 | -0.362 | 0.000 | 0.06 | | | 191.7 | OK | |
| S1.006 | S8 | -0.288 | 0.000 | 0.00 | | | 2.1 | FLOOD RISK* | |

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|---------------------------------|--|----------------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micco |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | |
| File NICEP Stormwater Model | Checked by | Urainage |
| The Night Scotimwater Model | Network 2020 1 2 | |
| IIIIOVyze | Network 2020.1.5 | |
| 100 year Daturn Daried Summary | of Critical Boquita by Maximum I | ouol (Donk |
| 100 year Recuri Period Summary | for Catabaant 1 | evel (Ralik |
| <u></u> | | |
| | | |
| Si | mulation Criteria | |
| Areal Reduction Factor | 1.000 Additional Flow - % of Total Fl | ow 0.000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Stora | ge 2.000 |
| Hot Start Level (mm) | 0 Inlet Coefficie | nt 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (1/per/da) | y) 0.000 |
| roui sewage per neccare (1/s) | 0.000 | |
| Number of Input Hydrog: | raphs 0 Number of Storage Structures 1 | |
| Number of Online Cont | crols 1 Number of Time/Area Diagrams 0 | |
| Number of Offline Cont | crols 0 Number of Real Time Controls 0 | |
| Count h | atia Dainfall Dataila | |
| Bainfall Mod | ol FEH | |
| FEH Rainfall Versi | on 1999 | |
| Site Locati | on GB 486200 413400 SE 86200 13400 | |
| C (1k | m) -0.025 | |
| D1 (1k: | m) 0.330 | |
| | (1) 0.312 | |
| E (1k | m) 0.300 | |
| F (1k | m) 2.451 | |
| Cv (Summe | r) 0.750 | |
| Cv (Winte | r) 0.840 | |
| Margin for Flood Rick War | aing (mm) 300 | 0 |
| Analysis | Timestep 2.5 Second Increment (Extended | 1) |
| D | IS Status OF | ΓF |
| D | VD Status C | DN |
| Inert | ia Status C | DN |
| | | |
| Profile(s) | Summer and Winte | er |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 144 | 10 |
| Return Period(s) (years) | 1, 30, 10 | 0 |
| Climate change (%) | 0,40,4 | 10 |
| | | |
| WARNING: Half Drain Time has no | t been calculated as the structure is to | oo full. |
| | | |
| | | Water |
| US/MH Return Clima | te First (X) First (Y) First (Z) Ove | rflow Level |
| PN Name Storm Period Chang | e Surcharge Flood Overflow A | ct. (m) |
| | | |
| S1.000 S3 15 Winter 100 +4 | ปรั กง | 2.320 |
| S1.002 S5 15 Winter 100 +4 | 0-5 0-8 | 2.120 1.972 |
| S2.000 S5 15 Winter 100 +4 | D% | 2.270 |
| S2.001 S5 15 Winter 100 +4 | 0% | 2.132 |
| S2.002 S6 15 Winter 100 +4 | 0% 30/15 Summer | 2.052 |
| S2.003 S7 15 Winter 100 +4 | 0% | 1.951 |
| S3.000 S6 15 Winter 100 +4 | | 2.329 |
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| | | |

| BuroHappold Ltd | | Page 14 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

 100 year Return Period Summary of Critical Results by Maximum Level (Rank

 1) for Catchment 1

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (1/s) | Half Drain Time (mins) | Pipe Flow (1/s) | Status | Level Exceeded |
|--------|---------------|----------------------------|--|----------------|-------------------|------------------------------|-----------------------|-------------|-------------------|
| S1.000 | S3 | -0.380 | 0.000 | 0.05 | | | 62.5 | OK | |
| S1.001 | S4 | -0.426 | 0.000 | 0.04 | | | 75.0 | OK | |
| S1.002 | S5 | -0.463 | 0.000 | 0.04 | | | 81.0 | OK | |
| S2.000 | S5 | -0.430 | 0.000 | 0.02 | | | 14.5 | OK | |
| S2.001 | S5 | -0.568 | 0.000 | 0.01 | | | 19.9 | OK | |
| S2.002 | S6 | 0.083 | 0.000 | 1.64 | | | 20.6 | SURCHARGED* | |
| S2.003 | S7 | -0.749 | 0.000 | 0.01 | | | 33.5 | OK | |
| S3.000 | S6 | -0.371 | 0.000 | 0.05 | | | 47.9 | OK | |

| BuroHappold Ltd | | Page 15 |
|-----------------------------|----------------------------|----------|
| Camden Mill | | |
| Lower Bristol Road | | |
| Bath | | Micro |
| Date 21/02/2022 09:15 | Designed by Stefan Gandler | Desinado |
| File NLGEP Stormwater Model | Checked by | Diamage |
| Innovyze | Network 2020.1.3 | |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 1

| | | | | | | | | | Water |
|--------|-------|-------------|--------|---------|--------------|-----------|-----------|----------|-------|
| | US/MH | | Return | Climate | First (X) | First (Y) | First (Z) | Overflow | Level |
| PN | Name | Storm | Period | Change | Surcharge | Flood | Overflow | Act. | (m) |
| S3.001 | S7 | 15 Winter | 100 | +40% | | | | | 2.257 |
| S3.002 | S8 | 15 Winter | 100 | +40% | | | | | 2.176 |
| S4.000 | S10 | 15 Winter | 100 | +40% | | | | | 2.360 |
| S4.001 | S12 | 15 Winter | 100 | +40% | | | | | 2.187 |
| S3.003 | S10 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 2.159 |
| S1.003 | S7 | 15 Winter | 100 | +40% | | | | | 1.941 |
| S1.004 | S15 | 15 Winter | 100 | +40% | | | | | 1.702 |
| S1.005 | S7 | 15 Winter | 100 | +40% | | | | | 1.363 |
| S5.000 | S14 | 15 Winter | 100 | +40% | | | | | 1.769 |
| S5.001 | S15 | 15 Winter | 100 | +40% | | | | | 1.637 |
| S5.002 | S15 | 15 Winter | 100 | +40% | | | | | 1.336 |
| S1.006 | S8 | 1440 Winter | 100 | +40% | | | | | 1.144 |

| DN | US/MH | Surcharged Depth | Flooded Volume | Flow / | Overflow | Half Drain Time | Pipe Flow | Status | Level |
|--------|-------|---------------------|-------------------|--------|----------|--------------------|--------------|-------------|----------|
| EN | Name | (111) | (| Cap. | (1/5) | (mills) | (1/5) | Status | Exceeded |
| S3.001 | S7 | -0.443 | 0.000 | 0.05 | | | 74.2 | OK | |
| S3.002 | S8 | -0.524 | 0.000 | 0.04 | | | 96.9 | OK | |
| S4.000 | S10 | -0.340 | 0.000 | 0.08 | | | 67.4 | OK | |
| S4.001 | S12 | -0.513 | 0.000 | 0.04 | | | 84.5 | OK | |
| S3.003 | S10 | 0.107 | 0.000 | 1.60 | | | 102.2 | SURCHARGED* | |
| S1.003 | S7 | -0.234 | 0.000 | 0.24 | | | 232.0 | FLOOD RISK* | |
| S1.004 | S15 | -0.219 | 0.000 | 0.26 | | | 260.0 | FLOOD RISK* | |
| S1.005 | S7 | -0.303 | 0.000 | 0.13 | | | 261.0 | OK | |
| S5.000 | S14 | -0.391 | 0.000 | 0.09 | | | 142.5 | OK | |
| S5.001 | S15 | -0.226 | 0.000 | 0.26 | | | 288.3 | FLOOD RISK* | |
| S5.002 | S15 | -0.330 | 0.000 | 0.09 | | | 290.0 | OK | |
| S1.006 | S8 | -0.022 | 0.000 | 0.00 | | | 2.4 | FLOOD RISK* | |

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