CHIRK

Flood Consequence Assessment and Surface Water Drainage Strategy

Prepared for: Kronospan Limited

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BASIS OF REPORT

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1.0 Introduction

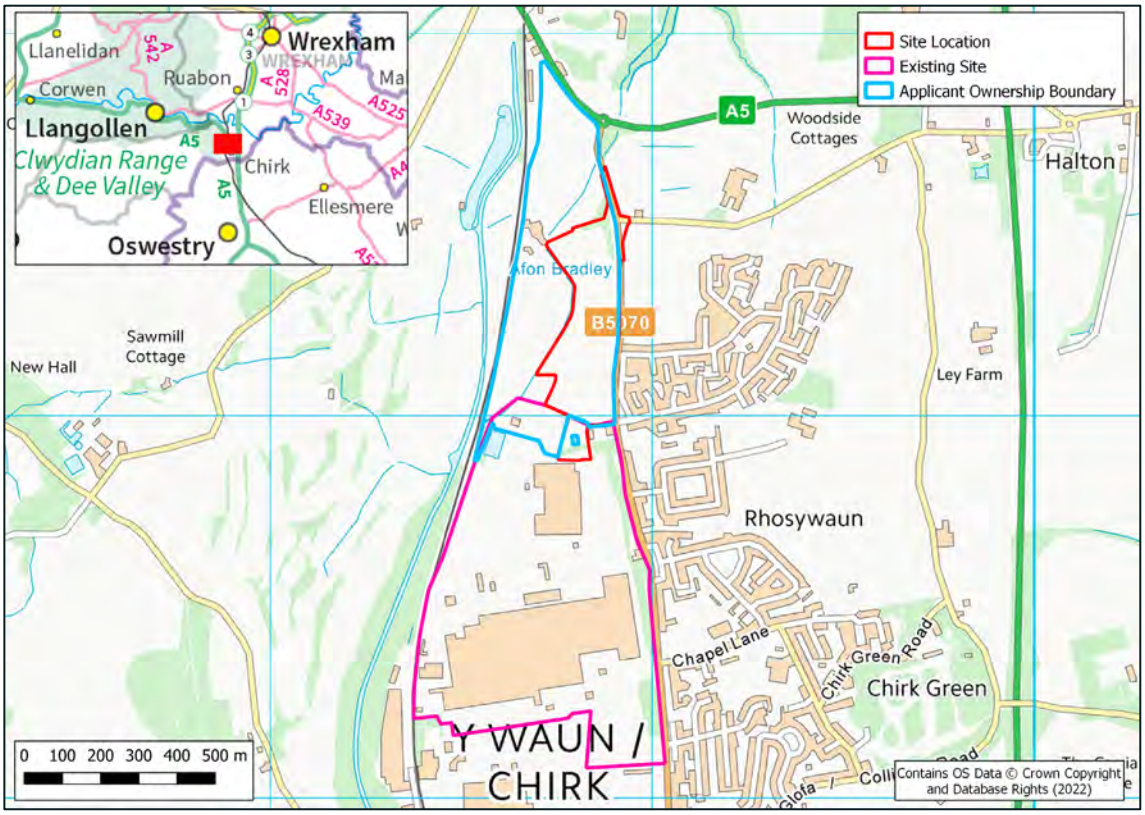
SLR Consulting Limited (SLR) were appointed by Kronospan Limited (Kronospan) to prepare a Flood Consequence Assessment (FCA) and Surface Water Drainage Strategy (SWDS) for a proposed access road and lorry park to the north of their existing facility in Chirk, LL14 5NT (the site).

This FCA has been prepared under the direction of a Technical Director of Hydrology at SLR who specialises in flood risk and associated planning matters. Reporting has been completed in line with Planning Policy Wales[1], Technical Advice Note 15 (TAN 15)[2], taking due account of current best practice documents relating to the assessment of flood risk published by the British Standards Institution BS8533[3] and local planning policies. Additionally, consideration has been made to emerging policy and guidance, in particular the update to TAN 15 which was published but the date of coming into force has been delayed.

1.1 Site Location

The site is centred on National Grid reference (NGR) SJ (33) 28847, 39253 and is located on the west side Chirk, approximately 11.8km south southwest of Wrexham. A site location plan is provided in Figure 1-1.

Figure 1-1
Site Location Plan



The River (Afon) Bradley, a tributary of the River Dee (Afon Dyfrdwy) at the northwest of the existing site, flowing north forming some of the western boundary of the proposed site. The River (Afon) Ceiriog is located circa 860m

1 Welsh Government, Planning Policy Wales, Edition 11, February 2021
2 Welsh Government, Technical Advice Note 15 Development, flooding and coastal erosion, July 2004
3 BS8533:2017, Assessing and managing flood risk in development: Code of Practice (2nd Edition, December 2017)

south of the existing site. Llangollen Canal is located about 70m west of the site and is separated from the site by the Shrewsbury to Chester Line railway.

The site is situated within a large parcel of land owned by the applicant which includes both of the fields on the opposite side of River Bradley, to the north west of the site and Afon Bradley Farm.

1.2 Administrative Context

The site is located under the planning jurisdiction of Wrexham County Council who are also the Lead Local Flood Authority (LLFA) and SuDS Approval Body (SAB). The site is located in Wales and Natural Resources Wales (NRW) are the statutory consultee for flood risk, however it is noted that due to the proximity of the political border there are potentially some hydrologically linked features that are under the jurisdiction of the Environment Agency.

2.0 Baseline Conditions

2.1 Existing Site Description

The proposed development connects to the existing site and will be constructed on two fields to the north. The land is currently an arable agricultural land use. It is separated by and surrounded by hedgerows / trees. The southern part of the site is currently scrub land with a building inside it. There is a gas governor shown on mapping that will not be altered by the proposed development but the access road connecting the new development area with the site will loop around this feature.

2.2 Topography

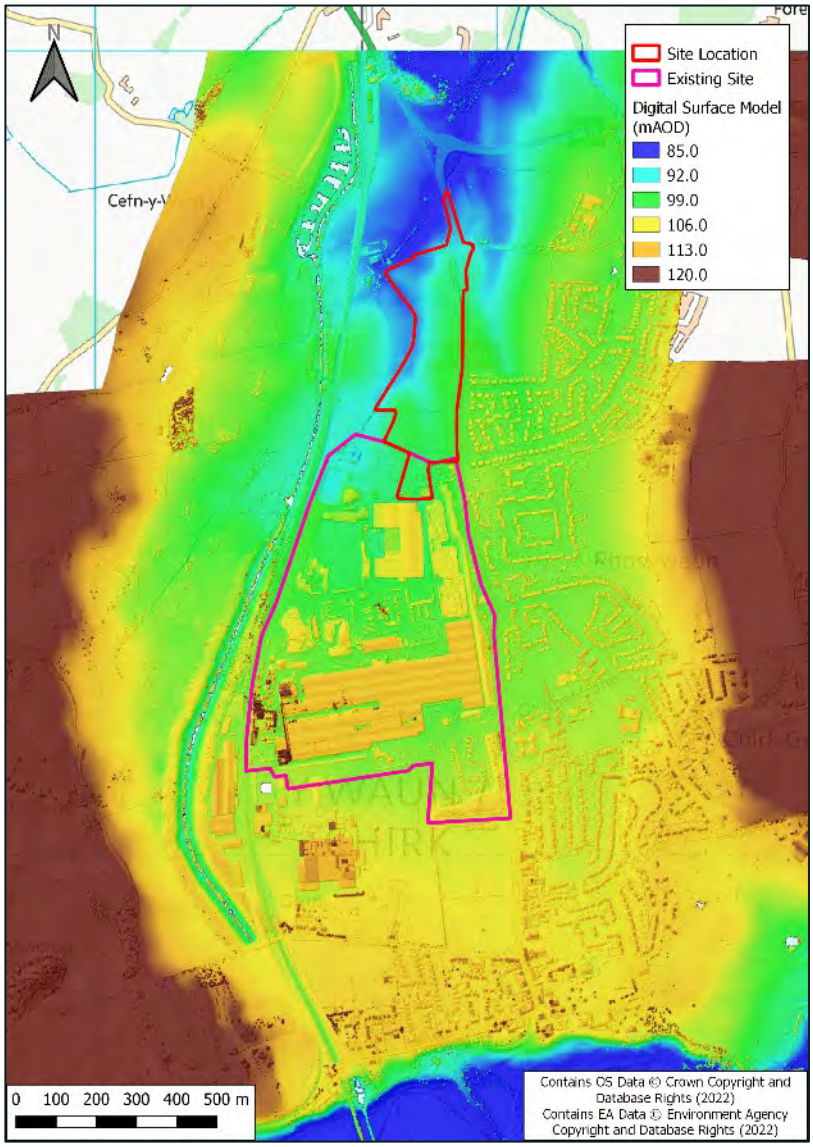
Data has been downloaded from the Environment Agency's database[4] collected by Light Detection and Ranging (LiDAR) for the site. The data uses light reflection in order to develop a map of the local terrain. A digital surface model (DSM) of the site and surrounding area is presented in Figure 2-1. This includes features present on the ground such as buildings, vehicles and vegetation.

The site is located in an area that slopes towards the north between to ridges of higher elevation. About 470m south of the existing site, levels start to slope south towards the course of the River Ceiriog. Elevations across the proposed development area range between 97.2 m above Ordinance Datum (AOD) in the south and 87.0mAOD in the northwest. Elevations at the existing site vary between 93.0mAOD in the northwest corner of the site and 104.3mAOD in the southeast of the site.

Additionally, both the canal and railway to the west of the site are shown to be lower than surrounding ground levels. The River Bradley has an elevation of 91.1mAOD in the southwest corner of the proposed development area and 86.4mAOD in the northwest corner.

4 Environment Agency, Defra Survey Data Download, https://environment.data.gov.uk/DefraDataDownload/?Mode=survey, Accessed April 2022

Figure 2-1
Digital Surface Model



2.3 Hydrology

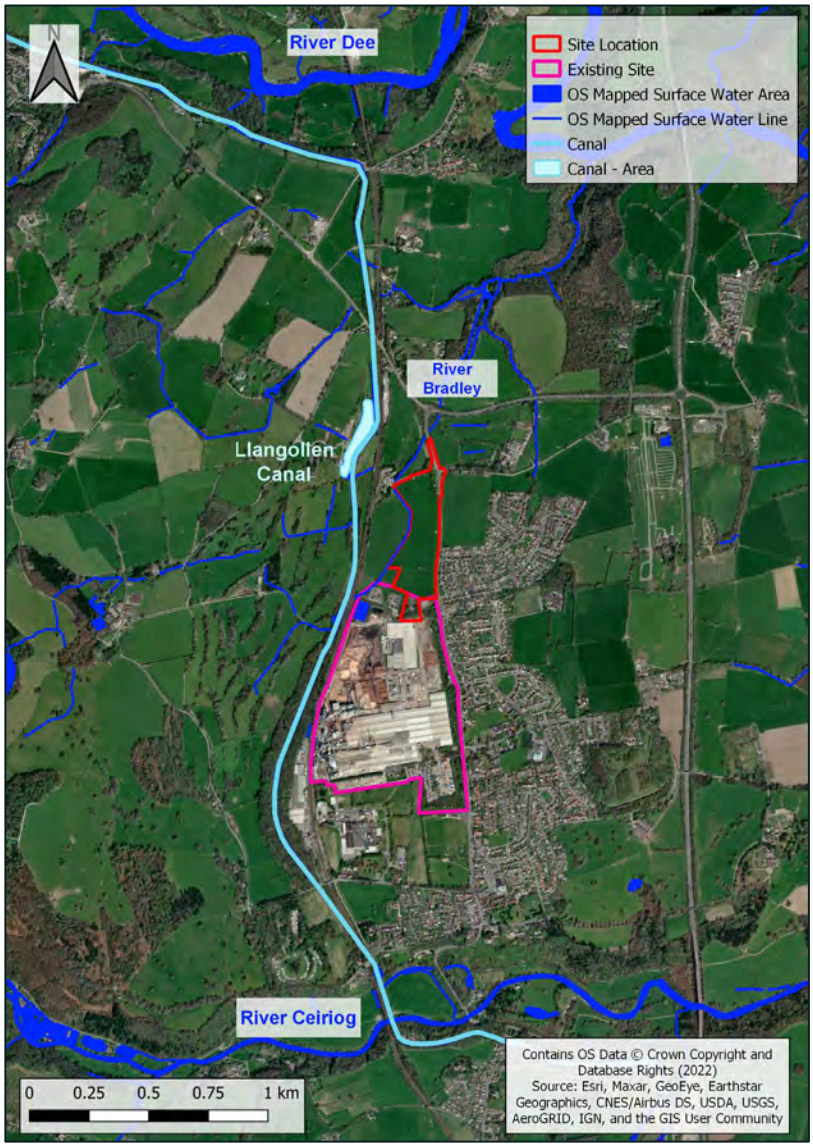
The River (Afon) Bradley, a tributary of the River Dee (Afon Dyfrdwy), is present at the northwest of the existing site, flowing north forming some of the western boundary of the proposed site. The confluence between the River Bradley and River Dee is located circa 1.4km north of the site.

The River Ceiriog is located about 0.9km south of the site, flowing from west to east. It has an upgradient catchment of circa 110km^2 of mainly rural catchment although includes some small urban areas. The river flows alongside the B4500 for much of its course.

Llangollen Canal is located about 73m west of the site.

There are also a number of other small tributaries in the vicinity of the site. These appear to either connect with River Bradley or the Llangollen Canal.

Figure 2-2
Local Hydrology and Water Features



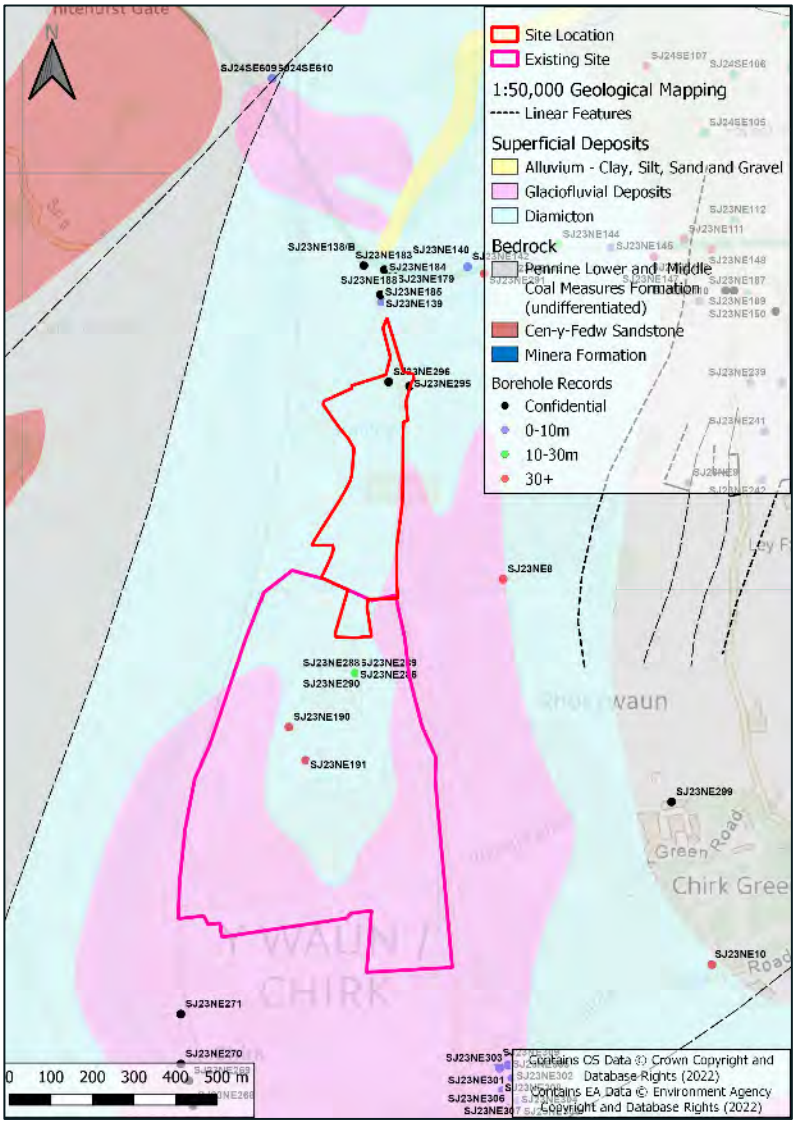
2.4 Geological and Hydrogeological Features

2.4.1 Geology

Mapping[5] (refer to Figure 2-3) indicates that the site is underlain by the Pennine Lower and Middle Coal Measures Formations (undifferentiated), which is described as an undifferentiated mudstone, siltstone and sandstone. The Pennine Middle Coal Measures Formation are indicated to be overlain by superficial glacial deposits. The surface superficial deposits in development area consist of diamiction (gravel in a mud matrix). In the south of the existing site is a glacial sand and gravel deposit.

5 British Geological Survey, Geology of Britain Viewer, https://mapapps.bgs.ac.uk/geologyofbritain/home.html?&_ga=2.69149649.1302426254.1632923777-1431768481.1632923777, Accessed April 2022

Figure 2-3
1:50,000 Mapped Geology



The British Geological Survey[5] hold borehole records located within the existing site. These are summarised in Table 2-1. These broadly support the geological mapping however indicate that and sand and gravel layers are located deeper than mapping indicates and appear to consist of higher proportions of clay.

Table 2-1
Summary of Geology Borehole Records

Borehole ID	Geology	Depth below ground
SJ23NE288	Topsoil	0.00-0.05
	Yellowish Brown Shaley Clay	0.05-0.80
	Dry Sandy Clay	0.80-1.60
	Coarse Grey Sand	1.60-2.30
	Grey Clayey Silt	2.30-3.50
	Grey Silty Clay	3.50-12.0 (base of hole)

Borehole ID	Geology	Depth below ground
SJ23NE289	Yellowish Brown Shaley Clay	0.00-1.80
	Coarse Grey Sand, some fragments of coal	1.80-3.30
	Grey Clayey Silt	3.30-6.20
	Grey Silty Clay	6.20-17.00 (base of hole)
SJ23NE286	Topsoil	0.00-0.20
	Stiff brown and grey sandy clay	0.20-1.80
	Grey clayey silt	1.80-4.30
	Grey silty clay	4.30-9.00 (base of hole)
SJ23NE190	Made Ground	0.00-0.50
	Yellow Clay	0.50-1.0
	Soft Silt with Stone	1.0-5.5
	Soft Grey Silt	5.5-22.0
	Gravel	22.0-23.5
	Brown Boulder Clay	23.5-25.0
	Brown Silt with Gravel and Coal	25.0-29.0
	Clay	29.0-30.0
	Brown Boulder Clay	30.0-34.0
SJ23NE191	Sand and Gravel	0.0-3.0
	Grey Soft Silt Dry	3.0-11.0
	Soft Grey Silt with Stone	11.0-21.0
	Gravel	21.0-30.5
	Boulder Clay	30.5-33.0

2.4.2 Hydrogeology

The Pennine Lower and Middle Coal Formation (undifferentiated) is designated[6] as a *"Secondary A aquifer"*. This is defined as "p*ermeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers"*.

The superficial diamiction deposits are designated as a *"Secondary (undifferentiated)"* which is defined as "*cases where it has not been possible to attribute either category A or B to a rock type. In most cases this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type."*

The definition of Secondary B rock type is: "*Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers".*

The bedrock and superficial deposits at the site are also described as having *"low vulnerability"*.

The site is not located within a source protection zone[7].

6 British Geological Survey, GeoIndex Onshore, Accessed April 2022 http://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.84204125.511733724.1651065568-553136592.1651065568

7 Natural Resources Wales, Interactive Map Viewer, Accessed April 2022 https://maps.cyfoethnaturiolcymru.gov.uk/Html5Viewer210/Index.html?configBase=https://maps.cyfoethnaturiolcymru.gov.uk/Geocortex/Essentials/REST/sites/External_Map_Browser/viewers/EMB_Address/virtualdirectory/Resources/Config/Default&locale=en-gb

3.0 Policy Status for Proposed Development

3.1 Development Proposal

The proposed development consists of a new lorry park, weigh bridge, access road and electrical utility infrastructure. The development plan is included in Appendix 01.

3.2 Flood Risk Vulnerability

In line with Figure 3 of TAN15, the proposed development as general industrial would be classified as a 'less vulnerable' development.

3.3 Anticipated Lifetime of Development

In lieu of more specific information and following best practice guidance, a lifetime of 75 years is applied for this non-residential development.

3.4 Planning Policy

3.4.1 National Planning Policy

The Planning Policy Wales[1] ensures that flood risk is considered at all stages in the planning process and that development is sustainable.

This document has been prepared using best practice principals using The SuDS Manual[8], TAN15[2] and Statutory standards for Sustainable Drainage Systems[9].

TAN 15 had been due to be updated with the new Flood Map for Planning on the 1st December 2021, however release of the updated TAN15 guidance has been suspended until 1st June 2023. Taking a conservative approach, flood model outputs for the Flood Map for Planning have also been referenced through this assessment. For clarity TAN 15 will refer to the 2004, which remains in place. TAN 15 (2021) will refer to the updated but not implemented version.

3.4.2 Wrexham Planning Policy

Wrexham County Borough Council are in the process of updating their local plan, however this is not yet adopted and therefore the Wrexham Unitary Development Plan 1996-2011[10] contains the current planning policy for the borough.

This planning document does not include specific policies on development in relation to flood risk. The most relevant policies / part of polices are:

"Policy GDO1 All new development should:-

i) Ensure that development does not result in, or is subject to, flooding, soil erosion, landslides or contamination either on or off the site."

"Policy EC12 Development (including the raising of land) within defied flood plains will only be permitted if it:-

a) Would not be subject to an unacceptable risk of flooding on-site; and/or

8 CIRIA (2015). Report C753, The SuDS Manual
9 Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems, Welsh Government, 2018
10 Wrexham Country Borough Council, Wrexham Unitary Development Plan 1996-2011, Adopted February 2005

b) Does not result in an unacceptable risk of flooding on or off-site; and/or
c) Does not adversely affect flood management or maintenance scheme"

"Policy EC13 Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted."

Additional guidance on the requirements for a sustainable urban drainage system (SUDS) follows this and is in line with national policy and guidance.

3.4.3 Flood Status: Development Advice Map

The Development Advice Map is used for attributing different planning actions depending on the identified flood risk. The zones are defined in Figure 1 of TAN 15 and is reproduced in Table 3-1.

Table 3-1
Development Advice Map Zones (reproduction of TAN 15 Figure 1)

Description of Zone		Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding	A	Used to indicate that justification test is not applicable and no need to consider flood risk further
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to defined adjacent extreme flood outline there is no need to consider flood risk further.
Based on Environment Agency extreme flood outlined, equal to or greater than 0.1% (river, tidal, or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain, without significant flood defence infrastructure	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification testing, including acceptability of consequence. Emergency services and highly vulnerable development should not be considered.

The site is predominantly located within the lowest flood risk category Flood Zone A. The western boundary of the site is located within Flood Zone B with relation to the River Bradley. The proposed development is outside of the flood zone other than a narrow part of proposed banking on the west central side of the site.

3.4.4 Flood Status: Flood Map for Planning

With the TAN 15 (2021), the Development Advice Map will be replaced by the Flood Map for Planning. The zones are defined in Figure 2 of TAN 15 (2021) and is reproduced Table 3-2.

Table 3-2
Flood Map for Planning Zones (reproduction of TAN 15 Figure 2)

Zone	Flooding from rivers	Flooding from sea	Flooding from surface water and small watercourses
1	Less than 1 in 1,000 (0.1%) (plus climate change) chance of flooding in a given year		
2	Less than 1 in 100 (1%) but greater than 1 in 1,000 (0.1%) change of flooding in a given year, including climate change.	Less than 1 in 200 (0.5%) but greater than 1 in 1,000 (0.1%) chance of flooding in a given year, including climate change.	Less than 1 in 100 (1%) but greater than 1 in 1,000 (0.1%) chance of flooding in a given year, including climate change.
3	A greater than 1 in 100 (1%) chance of flooding in a given year, including climate change.	A greater than 1 in 200 (0.5%) chance of flooding in a given year, including climate change.	A greater than 1 in 100 (1%) chance of flooding in a given year, including climate change.
TAN 15 Defended Zones	Areas where flood risk management infrastructure provides a minimum standard of protection against flooding from rivers of 1:100 (plus climate change and freeboard)	Areas where flood risk management infrastructure provides a minimum standard of protection against flooding from the sea of 1:200 (plus climate change and freeboard).	Not applicable.

The Flood map for Planning shows the development area primarily falls within Flood Zone 1 although the western boundary of the site falls within Flood Zones 2 and 3 in relation to the River Bradley.

There is a small, isolated surface water flood zone in the centre of the site otherwise the site is located in Flood Zone 1 in relation to surface water flooding.

3.4.5 Flood Acceptability

As summarised in Table 3-3, the proposed development is acceptable within the zone in which it is located. However, assessment of the flood risk (as is completed below) is required.

Table 3-3
Summary of Acceptability of Development in relation to Development Advice Map Zone

DAM	Development Type Proposed	Planning Requirements	Acceptability criteria	Development Advice
A	Less Vulnerable	• Justification test not applicable • Refer to surface water requirements	• No increase in flooding elsewhere	No constraints relating to river or coastal flooding, other than to avoid increasing risk elsewhere.

DAM	Development Type Proposed	Planning Requirements	Acceptability criteria	Development Advice
B	Less Vulnerable	• If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further. • Refer to surface water requirements	• Acceptable consequence for nature of use • Occupiers aware of flood risk • Escape / evacuation routes present • Effective flood warning provided • Flood emergency plans and procedures • Flood resistant design • No increase in flooding elsewhere	Generally suitable for most forms of development. Assessments, where required, are unlikely to identify consequences that cannot be overcome or managed to an acceptable level. It is unlikely therefore that these would result in a refusal of planning consent on the grounds of flooding.

3.4.6 Justification test

With reference to TAN 15, a justification test is only required for parts of zone B where flooding has been identified as a material consideration to allow for localised problems. The flood risk is assessed below but in summary the development will have:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the proposed development on flood risk generally; and
- Minimal disruption to natural heritage.

The proposed development is considered to comply with the justification test.

3.5 Climate Change

Peak rainfall intensity, sea level, peak river flow; offshore wind speed and extreme wave heights are all expected to increase in the future as a result of climate change

Climate change is inherently included within the Flood map for Planning. These have been applied as:

- Tidal - 1.1m uplift to sea level; and
- Fluvial: central allowance.

Further guidance is provided by Welsh Government in Flood Consequences Assessments: Climate Change Allowances[11].

3.5.1 Peak Fluvial Levels

Guidance provided by the Welsh Government sets out the application of climate change allowance for each of the major river basins in Wales. The site is located within the Dee River Basin District and the relevant climate change allowances are reproduced in Table 3-4. The central allowance should be used for justification of development while the upper end estimate should be used to develop mitigation measures.

11 Welsh Government, Flood Consequence Assessments: Climate Change, September 2021

Table 3-4
River Dee Climate Change Allowances.

River Dee	Total potential change anticipated by the 2020s	Total potential change anticipated by the 2050s	Total potential change anticipated by the 2080s
Upper end estimate	20%	30%	45%
Change factor / central estimate	10%	15%	20%
Lower end estimate	5%	5%	5%

3.5.2 Peak Sea Level Rise

Wrexham County is remote from the coast and therefore no sea level rise allowances are provided by the Welsh Government.

3.5.3 Peak Rainfall Intensity

Both the central and upper estimates should be assessed to understand the range of impact to peak rainfall intensity. The central estimate should be used to inform design levels, whereas where the assessment indicates a significant flood risk for the upper end estimate, the flood consequences assessment will need to provide mitigation measures. This therefore relates to a **20%** and **40%** increase respectively.

Table 3-5
Table 2 Change to Extreme Rainfall Intensity
(Compared to 1961-90 baseline)

Allowance Category	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

4.0 Assessment of Flood Risk

4.1 Potential Sources of Flooding

There are a number of potential sources of flooding and these include:

- Flooding from rivers or fluvial flooding;
- Flooding from the sea or tidal flooding;
- Flooding from surface water or pluvial flooding;
- Flooding from groundwater;
- Flooding from sewers; and
- Flooding from reservoirs, canals, and other artificial sources.

The flood risk from each of these potential sources is discussed below.

4.1.1 Flooding from Rivers or Fluvial Flooding

As discussed in Section 3.4.3 and 3.4.4, the site is predominantly in the lowest flood zone categories (1 and A). However the western boundary of the site is indicated to be at risk of flooding from the River Bradley. A technical assessment of flood risk from this source is completed in Section 5.0.

4.1.2 Flooding from the Sea or Tidal Flooding

The site is located remote from the coast and has an elevation of greater than 85mAOD. There are no tidal water bodies within the vicinity of the site.

For these reasons the risk of flooding from the sea or tidal flooding is negligible and is not considered further.

4.1.3 Flooding from Surface Water or Pluvial Flooding

There is land at higher elevation that the site to the east, south and west of the site. Any surface water runoff from these areas could progress towards the site. To the west of the site, the Llangollen Canal would intercept surface water runoff from progressing closer to the site.

The estimated area of surface water runoff progressing to the site is approximately 2.3km^2 including the village of Chirk and surrounding agricultural fields. The area also includes the existing Kronospan site. Runoff from this area would likely not be a large volume and would flow under topographic gradients into the River Bradley.

The conceptual understanding of the site is supported by the Flood Map for Planning (Appendix 02). There is a small, isolated area inside the site indicated to be at risk of surface water flooding. This is associated with the current undulations within the site creating a small topographic area of potential pooling.

The risk of surface water flooding at the site is considered very low and is not assessed further.

4.1.4 Flooding from Groundwater

Groundwater flooding is the emergence of the water table from the land surface. For groundwater flooding to occur typically there has to be:

- Underlying geology of higher permeability and water storage or superficial deposits with significantly higher permeability and water storage than the underlying bedrock; and / or
- Rapid changes in the topography that could bisect the site.

The geology underneath the site would not typically be associated with groundwater flooding however, particularly given that the borehole records indicate that the superficial deposits are described as clayey near the surface.

There are no surface water emergency features such as springs or groundwater fed pond on local mapping that would indicate a high groundwater table and there are not rapid changes in topography at the site.

This indicates a low risk of groundwater flooding.

However, even if groundwater could reach the near surface, it would flow down the course of the River Bradley and away from the site and therefore is inherently lower than the fluvial risk.

4.1.5 Flooding from Sewers and Water Mains

The Site is currently agricultural land and is therefore not thought be to served by any sewers or water mains. It is possible that public sewers or water mains could be present along Holyhead Road, connecting local residential properties. However, any potential surcharged flows would follow the same mechanism of propagation as for surface water flooding and would drain north and west to lower ground away from the Site.

The risk of flooding from sewers is not deemed significant has not therefore been considered further.

4.1.6 Flooding from Reservoirs, Canals and other artificial sources

The site is indicated to not lie within an area at risk of flooding from a reservoir failure.

The Llangollen Canal is located about 70m west of the site; however this is a sunken feature and therefore failure would not result in overground flows. Even if there were some flows these would be towards the north rather than towards the site. No other artificial sources have been identified in the vicinity of the site.

Flooding from this source is considered negligible.

4.1.7 Flooding from Infrastructure Failure

The site is not reliant on protection from flood defences and therefore is not at additional risk of flooding from this source.

There are no identified pumping stations upgradient of the site and even if there was such an infrastructure failure, surface water would flow under topographic gradients around the proposed development into the River Bradley.

4.1.8 Summary

A summary of the potential sources of flooding and the flood risk arising from them is presented in Table 4-1.

Table 4-1
Potential Sources of Flooding

Potential Source of flooding	Potential Significant Flood Risk requiring further assessment (Y/N)
Rivers or Fluvial Flooding	Y
Sea or Tidal Flooding	N
Surface Water or Pluvial Flooding	N
Groundwater	N
Sewers	N
Reservoirs, Canals and other Artificial Sources	N
Infrastructure Failure	N

The flood screening assessment indicates that further assessment of fluvial flooding is required for the site. This is completed in Section 5.0.

5.0 Technical Assessment

As discussed above there is a risk of fluvial flooding in relation to the River Bradley. A data request was submitted to Natural Resources Wales, who confirmed they hold no detailed modelling adjacent to the site. In lieu of better data, the flood levels from the Flood Map for Planning can be estimated through comparison against topographical data.

5.1 Development Advice Map

The only flood zone included on the Development Advice Map adjacent to the site is Flood Zone C2. This outline is created by modelling of the 0.1% AEP event. Flood Zone B at its closest is indicated to be 150m north of the site. Given the variation in the general elevation, these flood levels would not be representative at the site but could indicate that due to the limited catchment upgradient of the site, flooding is not anticipated to exceed the bank during the 1% AEP event.

The 0.1% AEP event is often assessed when there is no model data for the 1% AEP design storm with uplift for climate change. This indicates that flood levels in the north of the site are circa 89.3mAOD. In the centre of the site, estimated flood levels are circa 89.5mAOD and in the south of the site are circa 91.0mAOD. The variation in the flood levels relates to the slope of the channel bed across the site.

The proposed development will be raised significantly above these levels and therefore it is considered unlikely that any aspect of the proposals would fall within the 1% AEP + climate change extent.

The edge of the embankment for the raising of the access road in the north and the storage area in the south west extent of the site overlap slightly with the mapped flood zone extent. Given the limited interaction with the 0.1% AEP event it is considered that this is likely to be outside of the 1% AEP and that no flood storage compensation would be required. However, given that there is no detailed model data to support this, the development will include level for level flood storage calculations. If these demonstrate that compensation is required this would be provided in the field on the opposite (west) bank.

5.2 Flood Map for Planning

The Flood Map for Planning included as Appendix 02 includes allowances for climate change. This data also supports the view that the site would only have a risk of flooding on the land on the western side of the River Bradley and these areas are not areas for development. This mapping is only available online making it more difficult for comparison against topographical information. However, the flood zones do not extend far from the watercourse and the only place of interaction would again be the northwest extent of the storage area in the southwest extent of the site.

5.3 Significance of Flooding

The proposed development consists of land uses with very low significance to flooding. The lorry park would not be impacted by shallow flood water in the unlikely event that levels got this high. Management would be considered of the materials placed in the storage areas, preferentially locating furthest from the river. Given that the areas will also be raised, flooding is extremely low probability.

In the unlikely event that flooding were to extend to the development areas, the raising would marginally reduce the flood storage in this area, however this is conceptually considered to only result in a minor uplift in flood levels with some additional flooding to the western side of the river. Given that this area is owned by the applicant and is not developed the risk is considered inconsequential.

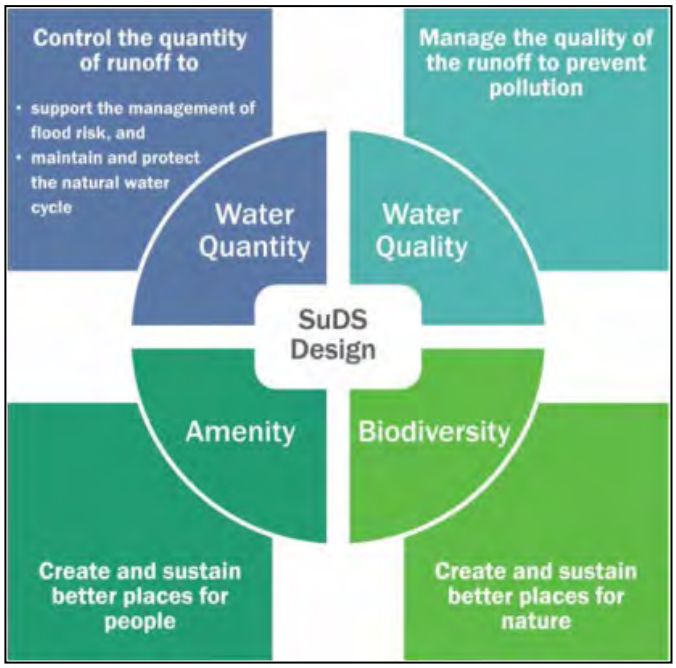
6.0 Surface Water Management Strategy

6.1 Sustainable Drainage Systems - Overview

Current best practice guidance document, The SuDS Manual[12], promotes sustainable water management through the use of SuDS and is required by the Welsh Government National Standards for sustainable drainage (SuDS). These systems must be approved by Flintshire County Council acting in its SuDS Approving Body (SAB) role before construction work begins.

There are four main categories which are referred to as the '*four pillars of SuDS*' as summarised in Figure 6-1.

Figure 6-1
Four Pillars of SuDS (after CIRIA Report C753)



The SuDS Manual identifies a hierarchy of SuDS for managing runoff, which is commonly referred to as a 'management train' and is depicted in **Figure 6-2**:

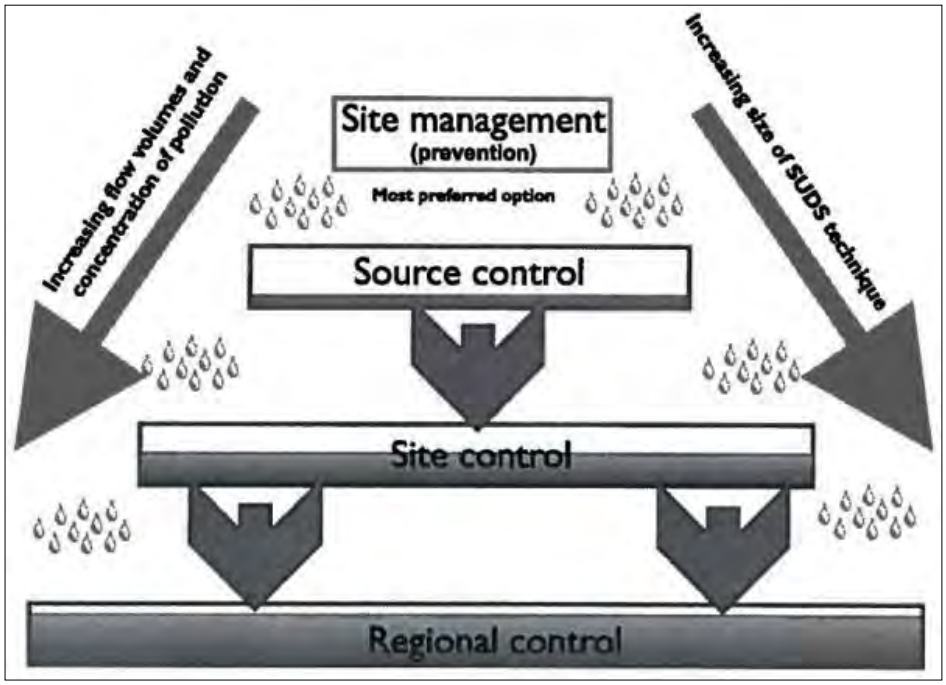
Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).

Source Control – control of runoff at or very near its source (such as the use of rainwater harvesting).

Site Control – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site).

Regional Control – management of runoff from several sites, typically in a retention pond or wetland.

Figure 6-2
SuDS Management Train (from CIRIA C753)



It is generally accepted that the implementation of SuDS, as opposed to conventional drainage systems, provides a number of benefits by:

- Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- Reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- Improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- Reducing potable water demand through rainwater harvesting; and
- Improving amenity through the provision of public open spaces and wildlife habitat; and replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

Flintshire County Council have provided further guidance for reaching SAB approval in *"Guidance for Pre-Application Advice and Full Application Approval of SuDS on new developments in accordance with The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2018"*.

6.2 SAB Overview

Welsh Government guidance[13] states that;

> *"From 7th January 2019, all new developments of more than 1 dwelling house or where the construction area is 100 square meters or more will require sustainable drainage systems (SuDS) for surface water. The SuDS must be designed and built-in accordance with Statutory SuDS Standards*[14]

[13] Welsh Government, Sustainable Drainage (SuDS) Statutory Guidance, 2019
[14] Welsh Government, Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage system, 2018

published by the Welsh Ministers and SuDS schemes must be approved by the local authority acting in its SuDS Approving Body (SAB) role before construction work begins."

The SABs were formed within Schedule 3 of the Flood and Water Management Act 2010) giving them the responsibility of:

- Evaluating and approving drainage applications for new development where construction work has drainage implications, and
- Adopt and maintain SuDS schemes, subject to the conditions and exemptions specified in the 2010 Act.

The SAB are not required to adopt the SuDS at Chirk as it would come under the "single curtilage" exemption however they still need to approve the proposals. This process is separate to planning but generally runs concurrently. Typically, SAB approval with conditions is gained at a similar time to planning permission although it is at the local planning authority's discretion is the SAB approval is running later.

As part of this planning application, a comprehensive SAB application is also being undertaken to parallel specific details and conclusions from this report. The SAB requirements are extracted from the Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems[9] which have six key themes:

- S1. Surface water runoff destination
- S2. Surface water runoff hydraulic control
- S3. Water Quality
- S4. Amenity
- S5. Biodiversity
- S6. Design of drainage for construction, operation and maintenance

These themes have been used to create an achievable drainage strategy at the site.

6.3 Existing Drainage System

The proposed development area is not currently developed and therefore there is no formal drainage infrastructure. Currently rainfall will infiltrate to ground until the infiltration capacity is formed and then will follow topographic gradients towards the north west. The runoff will enter the River Bradley diffusely and flow away from the site.

6.4 Pre-Development Runoff Rates

6.4.1 Greenfield

Greenfield runoff rates for the whole site, and areas of the site equivalent proposed impermeable development, were estimated through application of the Revitalised Flood Hydrograph Model (ReFH2). ReFH2 is widely accept as best practice of estimating flood peaks and hydrographs for small catchments[15].

The ReFH2 method is applied using software 'The Revitalised Flood Hydrograph' modelling tool. The catchment parameters have been downloaded from the Flood Estimate Handbook Webservice and have been reviewed as appropriate against the site and local area baseline conditions. A summary of the results for key design storms is provided in Table 6-1 and full results are provided in Appendix 03.

15 Environment Agency, Estimating flood peaks and hydrographs for small catchments: Phase 1, Project: SC090031, May 2012

Table 6-1
ReFH2 Greenfield Runoff Summary (per hectare)

Annual Exceedance Probability (%)	Peak Runoff Rate (l/s/ha)	Peak Runoff Volumes* (m^3/ha)
100	2.1	13
50	2.4	15
3.3	7.0	45
1	10.2	66

The whole site has an area of approximately 9.172ha. A small area in the north east extent of the site is replacing the existing roads to provide a round at the junction. However, little is known about the highways' drainage at this time and therefore taking the conservative approach it is assumed that for the baseline calculations this is acting as greenfield. A summary of the greenfield runoff rate for the entire site is provided in Table 6-2

Table 6-2
ReFH2 Greenfield Runoff Summary (whole site)

Annual Exceedance Probability (%)	Peak Runoff Rate (l/s/ha)	Peak Runoff Volumes* (m^3/ha)
100	18.9	116
50	22.3	138
3.3	34.4	217
1	44.5	283

This runoff would enter the River Bradley diffusely along the western edge of the site.

6.5 Constraints on the use of SuDS

6.5.1 Geology

As discussed in Section 2.4, although the site is indicated to be underlain by Secondary aquifer, which sometimes have sufficient permeability to support infiltration techniques. However, borehole logs within the existing Kronospan site and just south of the proposed development area, describe the underlying geology as clayey. Gravel layers are indicated to be a significant depth below ground level and therefore surface infiltration features would not reach them. The gravel layers are not thick enough to indicate that soakaways would be supported either.

6.5.2 Topography

The site naturally slopes towards the northwest and the River Bradley. SuDS and drainage features should be preferentially located towards the north and north west of impermeable areas to ensure gravity drainage.

6.5.3 Water Features

As discussed in Section 2.3, the site is bounded by the River Bradley in the west. Discharge connections would be feasible to this feature.

6.5.4 Flood Zones

SuDS features should be located outside of the flood zones to ensure that during large storm events the SuDS features would remain operational. This precludes locating SuDS features in the very west of the site along the course of the River Bradley.

6.6 Proposed Discharge Arrangement

With reference to The SuDS Manual, the hierarchy of preferred disposal options for surface water runoff from development sites in decreasing order of sustainability is as follows:

1. Rainwater Harvesting
2. Infiltration to Ground;
3. Discharge to Surface Waters; or
4. Discharge to Sewer.

Table 6-3 summarises the suitability of disposal methods suitability in the context of the Site and the proposed development.

Table 6-3
Suitability of Surface Water Disposal Methods

Surface Water Disposal Method (in Order of Preference)	Suitability Description	Method Suitable? (Y / N)
Rainwater Harvesting	It not currently foreseen that the proposed development would have a significant demand for water. Taking a conservative approach it is assumed that there will be no rainwater harvesting at the site.	N
Infiltration to Ground	As discussed in Section 6.5.1, the geology beneath the site is considered to not have sufficient permeability to support drainage to ground. Furthermore, if it did then groundwater would likely be in connectivity with the River Bradley and there would not be sufficient unsaturated zone between the base of the infiltration features and the water table.	N
Discharge to Surface Waters	The River Bradley bounds the site to the west and currently receives the greenfield runoff from the site albeit diffusely. A connection could be achieved to the River Bradley.	Y
Discharge to Sewer	The site is not afforded connection to sewer and it is understood that there are no public sewers located in the vicinity of the site. Furthermore, there are more preferable options in the drainage location hierarchy available.	N

6.7 Conceptual SuDS Strategy

The lorry and staff car parking areas will be constructed as permeable paving with a geomembrane and sub-base. Surface water runoff from the lorry and car parks as well as the access road on the raised development platform will all be routed into the permeable paving above the geomembrane.

Runoff will be allowed to infiltrate down through the permeable sub-base entering a smaller area of geo-cellular crates which will underlie an area beneath the lorry parking spaces. All other areas of hardstanding located on the raised development platform will route runoff into the crates or permeable paving sub-base including the roundwood storage area.

The substation will be constructed where possible from permeable materials (such as gravels or stones) and therefore not require formal drainage for all areas. Substation detailed design would be completed within post application design and will include pollution control measures required to contain any potential spill of hazardous substances. Any significant areas of hardstanding within the substation area will be included within the final drainage design, with flows routed to the wider site drainage system.

The crates will discharge to wetlands located in the north of the site, one either side of the existing farm access track. The roundabout area will also discharge into the northern wetland area.

The water will then be discharged at a controlled rate into the River Bradley in the north west of the site.

A conceptual SUDS strategy drawing is provided in Drawing 01.

6.8 Contributing Catchment

The contributing catchments for the site have been measured from the development plans available in Appendix 01 and are summarised in Table 6-4.

Table 6-4
Contributing Catchment

Area Name	Location on Site	Area (m2)	Area (ha)	Runoff Coefficient	Contributing Area (ha)
Lorry Park	Centre to north	16172	1.617	1	1.617
Access Road	East Side of lorry park	4230	0.423	1	0.423
Access Road	Across Site – North Raised area	3708	0.371	1	0.371
Access Road	Across Site - South	7441	0.744	1	0.744
Substation	South west	3553	0.355	0.25	0.089
Roundwood Storage	West	4660	0.466	1	0.466
Roundwood Storage	East	4130	0.413	1	0.413
Crate Catchment		**43894**	**4.389**		**4.123**
Roundabout	North	7106	0.711	1	0.711

Area Name	Location on Site	Area (m2)	Area (ha)	Runoff Coefficient	Contributing Area (ha)
Total Developable Area		**51000**	**5.100**		**4.834**

6.9 Allowable Discharge Rate

Post-development peak runoff rate will be restricted to the equivalent greenfield rate for a number of return storm events. The design storm will be restricting runoff from the 1% AEP with an uplift of 40% in rainfall intensity associated with climate change to the present day 1% AEP peak greenfield rate. As shown in Table 6-4 above, the proposed drainage system will drain an effective impermeable area of 4.834ha. The allowable discharge rates for the considered storms are summarised in Table 6-5.

Table 6-5
Allowable Discharge Rates

Annual Exceedance Probability	Equivalent Greenfield Rate for Proposed Impermeable Area* (l/s)
50%	11.7
3.3%	33.9
1%	49.3
1% + 40% CC	49.3

*Based on 4.834ha Proposed Impermeable Area

6.10 Modelling Parameters

The proposed drainage strategy has been modelled using the Source Control Module of MicroDrainage, which is suitable for the completion of calculations for the purposes of planning. The levels are indicative at this time to demonstrate feasibility. Some small variation may occur as part of post planning detailed design.

The following elements are included within the modelling and connected in a cascade.

6.10.1 Complex Structure

A complex structure module has been created for the modelling of the permeable paving underlain by geo-cellular crates.

- Contributing Area 4.123ha;
- Cellular Structure:
  - Invert Level 98.74mAOD;
  - Area: 1100m^2;
  - Depth of Crates: 0.66m;
  - Porosity: 0.95
  - **Attenuation Volume Provided: 726m^3**
- Porous Car Park:

- Invert Level: 99.40mAOD;
- Cover Level: 100.00mAOD;
- Width: 38m;
- Length: 238m;
- Area of Permeable Paving (calculated): 9,044m^2;
- Depth of Permeable Paving: 0.6m;
- Porosity: 0.3
- Attenuation Volume Provided: **1,628m^3**

- Complex Outflow Control:
  - Orifice 1:
    - Invert Level: 98.74mAOD;
    - Diameter: 108mm
  - Orifice 2:
    - Invert Level: 99.40mAOD;
    - Diameter: 127mm

6.10.2 Wetlands

The below parameters outline the requirements of the features in relation to storm water attenuation however, the footprint may be increased to create greater biodiversity and amenity benefits through interaction with the ecology and landscape architecture requirements.

South Wetland

- Upstream Structure: Complex Structure
- Contributing Catchment: 0.36ha
- Additional Catchment from Feature: 0.300ha;
- Invert Level: 88.4mAOD;
- Cover Level / High Level Overflow: 89.0mAOD;
- Depth: 0.6m;
- Area at Base of Wetland: 2400m^2; and
- Area at "High Level Overflow" of Wetland: 2,949m^2.
- Attenuation Volume: **1,558m^3**
- Complex Flow Control:
  - Orifice 1:
    - Invert Level: 88.4mAOD;
    - Diameter: 70mm
  - Orifice 2:
    - Invert Level: 88.700mAOD;

- Diameter: 173mm

North Wetland

- Upstream Structure: South Wetland
- Contributing Catchment: 0.36ha
- Additional Catchment from Feature: 0.086ha;
- Invert Level: 83.4mAOD;
- Cover Level: 84.0mAOD;
- Depth: 0.6m;
- Area at Base of Wetland:525m^2; and
- Area at "Top of Bank" of Wetland: 2,797m^2.
- Attenuation Volume: **392m^3**
- Complex Flow Control:
  - Orifice 1:
    - Invert Level: 83.4mAOD;
    - Diameter: 100mm
  - Orifice 2:
    - Invert Level: 83.725mAOD;
    - Diameter: 200mm

6.10.3 Summary

The total attenuation volume provided within the SuDS features (excluding the pipe network) is **4,304m^3.**

6.11 Water Quantity Design Standard

6.11.1 Control of Runoff Volume During Frequent Storms

The SuDS Manual requires *'the prevention of runoff from the [site] for the majority of small (frequent) rainfall events (or for the initial depth of rainfall for larger events)'*. This is known as Interception and '*Interception of about 5mm is normally achievable.'* For the proposed development that equates to 255m^3.

As discussed in Section 6.5, there is no potential associated with the development for rainwater harvesting and the underlying geology does not support wholesale infiltration techniques. Discharge of water into the raised land of the development platform would not be appropriate and does not meet water quality requirements, however the wetlands will be unlined and would allow infiltration during small frequent storms.

6.11.2 Control of Runoff Volume During Extreme Storms

The increase in the impermeable area inherently increases the volume of discharge generated at the site. However, the proposed drainage system provides attenuation so that the water can be released at a lower peak rate over a long period of time.

A summary of the performance of the attenuation features is provided in Table 6-6, the rate control in Table 6-7, and full calculations are provided in Appendix 04.

Table 6-6
Post-Development Attenuation Performance

Annual Exceedance Probability (%)	Complex Structure			South Wetland		North Wetland	
	Critical Storm Duration (mins / Season)	Maximum Attenuation Volume m^3	Half Drain Time (min)	Critical Storm Duration (mins / Season)	Maximum Attenuation Volume m^3	Critical Storm Duration (mins / Season)	Maximum Attenuation Volume m^3
50	720 min Winter	712	370	4,320 min Winter	1,023	5,760 min Winter	205
3.3	360 min Winter	1,467	458	2,160 min Winter	1,243	2,160 min Winter	288
1	240 min Winter	1,981	528	1440 min Winter	1,386	1,440 min Winter	330
1 + 40% CC	360min Winter	2,862	583	1,440 min Winter	1,579	1,440 min Winter	386

Table 6-7
Summary of Post-Development Discharge Rates

Annual Exceedance Probability (%)	Greenfield Runoff Rate (l/s)	Post-Development Runoff Rate (l/s)	Reduction in Discharge Rate	
			(l/s)	%
50	11.7	11.6	0.1	1
3.3	33.9	25.0	8.9	26
1	49.3	34.3	15.0	30
1 + 40% CC	49.3	47.7	1.6	3

The results demonstrate that the proposed drainage strategy would provide a significant reduction in runoff rates from the site reducing the extreme flood levels down gradient of the site and meeting national and local ambitions.

6.12 Water Quality Design Standard

The drainage of built development has the potential to reduce water quality through increases in suspended solids, metals and hydrocarbons in the surface water runoff. The risks associated with a number of typically drained surfaces (land uses) are assessed in Section 26 of The SuDS Manual and expressed in Table 26.2 as a potential 'Pollution hazard level'. A review of each of the land uses has been completed with reference to Table 26.2 of The SuDS Manual to determine the appropriate Pollution Hazard Levels.

With reference to The SuDS Manual, post development surface water runoff generated from the site pollution hazard levels are summarised in Table 6-8.

Table 6-8
Pollution Hazard Potential of the Proposed Development

Proposed Land Use at Site	SuDS Manual Land Use Category	Pollution Hazard Level	Pollution Hazard Indices		
			Total Suspended Solids (TSS)	Metals	Hydrocarbons
Lorry Park and Access Road	Site with heavy pollution potential (e.g. highly frequented lorry approaches and industrial sites)	High	0.8	0.8	0.9
Staff Car Park	Non-residential Car Parking	Medium	0.7	0.6	0.7
Substation	Professional Experience no category provided	Low	0.5	0.4	0.4
Roundwood Storage Area	Commercial Yard	Medium	0.7	0.6	0.7

The proposed SuDS Features have pollution mitigation indices as set out in Table 6-9

Table 6-9
Pollution Mitigation Indices of the Proposed Development

SuDS Feature	Pollution Hazard Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Wetland	0.8	0.8	0.8

A comparison of the *Pollution Hazard Indices* and *Mitigation Indices* for the proposed 'Source Control', 'Conveyance', and 'Site Control' measures are provided in Table 6-10. Taking a conservative approach it has been assumed that the runoff from the storage areas and substation may be routed in below the level of the geomembrane in the permeable pavement and therefore not gain the mitigation benefits of the permeable paving.

Table 6-10
SuDS Performance: Water Quality Indices Assessment (Discharge to Groundwater)

Area of Site	Land Use (from SuDS Manual	Index	SuDS Mitigation Indices Comparison*		
			Total Suspended Solids (TSS)	Metals	Hydrocarbons
Lorry Park and Access Road	Site with heavy pollution potential (e.g. highly frequented lorry approaches and industrial sites)	Hazard	0.8	0.8	0.9
		Mitigation[1,2]	1.1[1,2]	1.0[1,2]	1.1[1,2]
		Water Quality Requirement Met? (Y/N)	**Y**	**Y**	**Y**
Staff Car Park	Non-residential Car Parking	Hazard	0.7	0.6	0.7
		Mitigation[1,2]	1.1[1,2]	1.0[1,2]	1.1[1,2]
		Water Quality Requirement Met? (Y/N)	**Y**	**Y**	**Y**
Substation	Professional Experience no category provided	Hazard	0.5	0.4	0.4
		Mitigation[2]	0.8[2]	0.8[2]	0.8[2]
		Water Quality Requirement Met? (Y/N)	**Y**	**Y**	**Y**
Roundwood Storage Area	Commercial Yard	Hazard	0.7	0.6	0.7
		Mitigation[2]	0.8[2]	0.8[2]	0.8[2]
		Water Quality Requirement Met? (Y/N)	**Y**	**Y**	**Y**

* Total SuDS mitigation index = mitigation index$_1$+0.5(mitigation index$_2$)
1 Permeable Paving
2 Wetland

Table 6-10 demonstrates that the water mitigation indices are met. However, taking a precautionary approach an oil interceptor will be installed prior to the discharge into the wetlands.

6.12.1 Lorry parking and access road

In addition to the SuDS features detailed above, the detailed drainage design will include details of oil interceptors which will be installed downstream of vehicular parking or transit areas. The oil interceptors will be positioned prior to flows entering the wetland areas and will be subject to regular inspection and maintenance. A Class 1 full retention oil separator will be required for the proposed scheme. The installed interceptor should

be compliant with BS EN 858-1:2002, the Pollution Prevention Guidance from NRW and the Construction Products Regulations.

Outlets from the wetland areas will be controlled and will include the facility to shut off discharge from the wetlands in the event of a spill on site. This control would allow any potential spill to be contained within the wetland areas, which could then be removed from these areas as part of remediation works.

6.12.2 Substation area

The detail drainage design will include formal drainage for any significant impermeable areas within the substation which will drain into the wider drainage system for the site. Other areas of the substation compound will be formed of permeable material and will be allowed to drain to ground. Measures will be included to control the potential release of hazardous substances from equipment within the substation area to ensure no potential pollution pathway to ground or to local surface water features.

6.12.3 Contaminated Flow Prevention

In addition, penstock shut off valves will be installed on each of the outlets to the wetlands so that in an event of a major spill occurring at the site that fails to be dealt with at source, water would be held within the system and then removed by tanker for appropriate treatment.

6.13 Exceedance and Culvert Surcharging

6.13.1 Exceedance from SuDS Features

In the unlikely event of a storm greater than the 1% AEP + 40% CC, some additional volume of storage will be provided within the freeboard of the SuDS features. If the exceedance continued for a longer period of time the SuDS features would exceed their cover levels.

From the crates naturally surcharge into the permeable paving. Surcharging flows from these would flow under topographic gradients along the access road towards the north and either across the field to the west of the development entering the River Bradley or into the wetlands.

Surcharging from the wetlands would flow across the floodplain and into the River Bradley.

Exceedance flows would not pose a flood risk to people or property.

6.13.2 Culvert Surcharge / Blockage

The proposed culvert beneath the access road to Afon Bradley Farm that connects the two wetlands will be regularly inspected and maintained and therefore a blockage is considered to be a low probability event. However, in the event of it becoming blocked the south wetland would exceed over a designated high level overflow (area of lower bank) which would route flows towards the adjacent river Bradley, mimicking existing extreme flow hydrology.

7.0 Principal Operation and Maintenance Requirements

7.1 Responsibility

The operation and maintenance would remain the responsibility of the applicant (Kronospan Limited) as the site owner and operator.

The following section outlines the recommended requirements for the maintenance of these areas. These recommendations will need to be updated through detailed design to reflect specific manufacturers recommendations.

7.2 Underground Pipe Network

A recommended operation and maintenance plan for the piped drainage network is summarised in Table 7-1.

Table 7-1
Typical Pipe System Operation and Maintenance Requirements

Maintenance Schedule	Required Action	Minimum Frequency
Regular Maintenance	Ensuring drainage intakes are clear of debris / silt	Monthly, or as required
Occasional Maintenance	Clear Gully Pots	6 monthly
	Jet clean sewer lines, gully tails and kerb channels to remove grease, grit, sediment and other debris to ensure conveyance capacity is not compromised.	Every 2 years
Intermittent Maintenance	CCTV survey of sewer lines to identify any defects/signs of performance degradation such as: • Cracked / deteriorating pipes; • Leaking joints/seals at manholes; • High water lines showing regular high stage in pipes (sign of lack of capacity or downstream constraint); and • Suspected infiltration or exfiltration.	Every 2-5 years
Remedial Actions	Repair defects using suitable methods. Effective temporary repairs may be sufficient in short term until scheduled/capital improvements can be made	As required
Monitoring	Record areas of surface ponding / intake bypassing / surcharging (photos, inundated areas, depths) during extreme storm events and investigate the reasoning for this post-storm	As required

7.3 Permeable Pavement

The anticipated maintenance and management for Permeable Paving associated with the surface water drainage system is outlined in Table 7-2:

Table 7-2
Typical Permeable Paving Maintenance Requirements

Maintenance Schedule	Required Action	Minimum Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on Site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying.	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to uses, and replace lost joining material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection.	Monthly for three months after installation
	Inspect for evidence of poor operation and/or wee growth – if required, take remedial action.	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers.	Annually

7.4 Wetlands

The typical maintenance requirements of a wetland are outlined below, however specific information would be provided after detailed design as this would be species dependent.

Table 7-3
Typical Wetland Maintenance Requirements

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

8.0 Conclusions

SLR Consulting Limited (SLR) have been appointed by Kronospan Limited to complete a Flood Consequence Assessment (FCA) and Surface Water Drainage Strategy (SWDS) to support a planning application for a proposed lorry park to the north of their existing facility in Chirk, LL14 5NT (the site).

The site is centred on National Grid reference (NGR) SJ (33) 8847, 39253 and is located on the west side Chirk, approximately 11.8km south southwest of Wrexham.

The River (Afon) Bradley bounds the site to the west and the western side of the site is indicated to be in Flood Zone C on the Development Advice Map, which is defined by the 0.1% AEP flood modelling. The Flood Map for Planning, which was developed with a planned update to the Technical Advice Note 15 (TAN15), which has been delayed also indicates that the western boundary of the site is located within Flood Zone 2 and 3 defined as the 0.1% and 1% AEP flood events including climate change allowances.

The proposed development is located outside of these areas. The very eastern edge of the bunding for the development platform is indicated to touch these flood zones, however given the minimal area and that any variation to flood extent would be an increase to the applicant's own development land on the opposite side of the river it is not considered necessary to provide purpose built flood compensation storage.

Flooding from tidal and seas, surface water / pluvial flooding, groundwater, sewer and water mains, reservoirs, canals and artificial sources, and infrastructure failure have all been screened and not significant flood risk has been identified.

The proposed development includes an increase in impermeable coverage of 5.1ha, which is unmitigated could result in increases in the peak runoff rates from the site. It is therefore proposed that the following SuDS Features would be included:

- Permeable Paving underlain by Geocellular Crates; and
- Wetland

Flows will be restricted to the equivalent greenfield rate or below including offsetting of a 40% increase in rainfall intensity as a result of climate change. This will be discharge into the River Bradley in the north of the site. The combined volume of attenuation provided by these features is **4,304m^3.**

The Simple Index Approach to water quality assessment for SuDS features as outlined in the SuDS manual has been used to demonstrate that sufficient mitigation is provided to offset the water quality hazard of surface water runoff from the proposed land uses. Taking a precautionary approach oil interceptor will be included as the water departs from the geocellular crates beneath the lorry park.

Exceedance routes from the SuDS features would follow topographic gradients into the River Bradley either directly or via the wetlands. Exceedance flows would not pose a risk to property or people.

The operation and maintenance of the SuDS features would be the responsibility of the applicant (Kronospan Limited) as the owner and operator of the site.

There are no flood risk or drainage constraints that would prohibit the proposed development.

DRAWING 01

Surface Water Drainage Strategy

C:\Users\eowen\AppData\Local\Temp\Temp1_Planning Drawing 1 Proposed Development - General Arrangement_A.zip\Planning Drawing 1 Proposed Development - General Arrangement_A.dwg

Southern Wetland

Cover (High Level Overflow) Level: 89.00mAOD

Invert Level: 88.40mAOD

Basal Area: 2,400sqm

Top of Cover Area: 2,949sqm

Complex Outflow

Orifice 1

Diameter: 70mm

Invert Level: 88.40mAOD

Orifice 2:

Diameter: 173mm

Invert Level: 88.70mOAD

New Discharge to the River Bradley via complex outflow to restrict to equivalent greenfield rates

Northern Wetland

Cover (Top of "Bank") Level:84.0mAOD

Invert Level: 83.4mAOD

Basal Area: 525sqm

Top of "Bank" Area: 797sqm

High Level Overflow to ensure exceedance is direct to river

Complex Outflow

Orifice 1

Diameter: 100mm

Invert Level: 88.400mAOD

Orifice 2:

Diameter: 200mm

Invert Level: 88.725mOAD

Complex Outflow

Orifice 1

Diameter: 75mm

Invert Level: 98.74mAOD

Orifice 2:

Diameter: 110mm

Invert Level: 99.4mOAD

Flow Restriction from Crates with additional outflow higher up for larger storm events

Permeable Paving underlain by a reduced area of geo-cellular crates

Modelled Complex Storage

Cover Level:100mAOD

Invert Level:98.74mAOD

Permeable Paving

Width:38m;

Length: 238m

Depth: 0.6m

Porosity: 0.3

Cellular Storage

Area: 600sqm

Depth: 0.66m

Substation

Detailed design to be progressed on design, however assumed 0.25 contribution during extreme storms - if pollutants used these would be within suitably bunded areas.

Afon Bradley

Afon Bradley Farm

North Access Roundabout

Lorry Park

Roundwood Storage Area

Roundwood Storage Area

Weighbridge

Weighbridge Car Park

132kV Substation

Sewage treatment plant

Lagoon

Shelter

0 50 100 150 200 250m

N

• Revision History	• Date
A Protective measures for limekiln added	29.11.22

Key

- Proposed Development
- Proposed Fence
- Wetland
- Detailed design to include measures to protect lime kiln from construction damage
- Flow Control Device
- Permeable Paving
- Geo-cellular Crates
- Pipes
- Exceedance Route
- Oil Interceptor
- Substation - Permeable Materials with high level overflow

client: KRONOSPAN

project: KRONOSPAN NORTH ACCESS ROAD

drawing title: SUDS Conceptual Drawing Markup

date: December 2022

drawing number: Drawing 001

scale(s): 1:2500@A3

Annotated on Axis P.E.D Limited Planning Drawing

C:\Users\eowen\AppData\Local\Temp\Temp1_Planning Drawing 1 Proposed Development - General Arrangement_A.zip\Planning Drawing 1 Proposed Development - General Arrangement_A.dwg

Southern Wetland

Cover (High Level Overflow) Level: 89.00mAOD

Invert Level: 88.40mAOD

Basal Area: 2,400sqm

Top of Cover Area: 2,949sqm

Complex Outflow

Orifice 1

Diameter: 70mm

Invert Level: 88.40mAOD

Orifice 2:

Diameter: 173mm

Invert Level: 88.70mOAD

New Discharge to the River Bradley via complex outflow to restrict to equivalent greenfield rates

Northern Wetland

Cover (Top of "Bank") Level:84.0mAOD

Invert Level: 83.4mAOD

Basal Area: 525sqm

Top of "Bank" Area: 797sqm

High Level Overflow to ensure exceedance is direct to river

Complex Outflow

Orifice 1

Diameter: 100mm

Invert Level: 88.400mAOD

Orifice 2:

Diameter: 200mm

Invert Level: 88.725mOAD

Complex Outflow

Orifice 1

Diameter: 75mm

Invert Level: 98.74mAOD

Orifice 2:

Diameter: 110mm

Invert Level: 99.4mOAD

Flow Restriction from Crates with additional outflow higher up for larger storm events

Permeable Paving underlain by a reduced area of geo-cellular crates

Modelled Complex Storage

Cover Level:100mAOD

Invert Level:98.74mAOD

Permeable Paving

Width:38m;

Length: 238m

Depth: 0.6m

Porosity: 0.3

Cellular Storage

Area: 600sqm

Depth: 0.66m

Substation

Detailed design to be progressed on design, however assumed 0.25 contribution during extreme storms - if pollutants used these would be within suitably bunded areas.

Afon Bradley

Afon Bradley Farm

North Access Roundabout

Lorry Park

Roundwood Storage Area

Roundwood Storage Area

Weighbridge

Weighbridge Car Park

132kV Substation

Sewage treatment plant

Lagoon

Shelter

0 50 100 150 200 250m

N

• Revision History	• Date
A Protective measures for limekiln added	29.11.22

Key

- Proposed Development
- Proposed Fence
- Wetland
- Detailed design to include measures to protect lime kiln from construction damage
- Flow Control Device
- Permeable Paving
- Geo-cellular Crates
- Pipes
- Exceedance Route
- Oil Interceptor
- Substation - Permeable Materials with high level overflow

client: KRONOSPAN

project: KRONOSPAN NORTH ACCESS ROAD

drawing title: SUDS Conceptual Drawing Markup

date: December 2022

drawing number: Drawing 001

scale(s): 1:2500@A3

Annotated on Axis P.E.D Limited Planning Drawing

APPENDIX 01

Development Plans

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

PROPOSED ROUNDABOUT

PROPOSED LORRY PARKING BAYS

METRES @ 1:1250 0 10 25 50 125

Rev	Description	Date	By / Chc	App
P02	PRELIMINARY ISSUE	24/03 2022	DB BW	AM
P01	PRELIMINARY ISSUE	22/03 2022	DB BW	AM

PRELIMINARY

KRONOSPAN NORTH ACCESS ROAD

kronospan

RAMBOLL

tel 01244 311855 chester@ramboll.co.uk
www.ramboll.co.uk

ACCESS ROAD OUTLINE LAYOUT

Project No:	Scale (@A1):	Drawn:	Date:
1620010941	1:1250	DB	MAR 22

Drawing No: KNA-RAM-01-00-DR-CH-0000

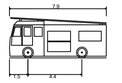
Rev: P02

24/03/2022 13:41:04

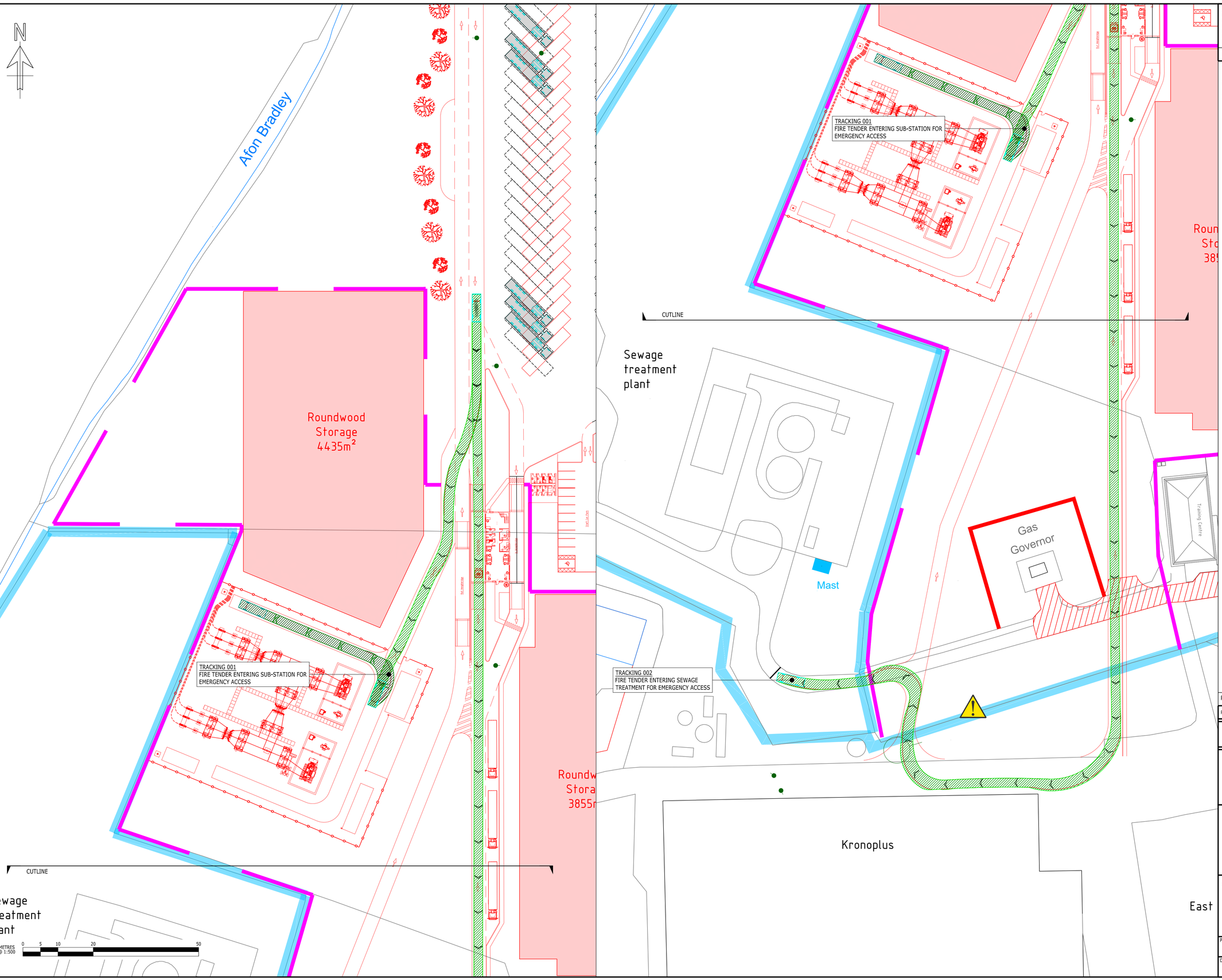
Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

VEHICLE TRACKING KEY



Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m



Rev	Description	Date	By / Chk	App
P01	PRELIMINARY ISSUE	10/03 2022	DB BW	AM

PRELIMINARY

KRONOSPAN NORTH ACCESS ROAD

RAMBOLL

tel 01244 311855 chester@ramboll.co.uk
www.ramboll.co.uk

SITE WIDE VEHICLE TRACKING FOR FIRE TENDER

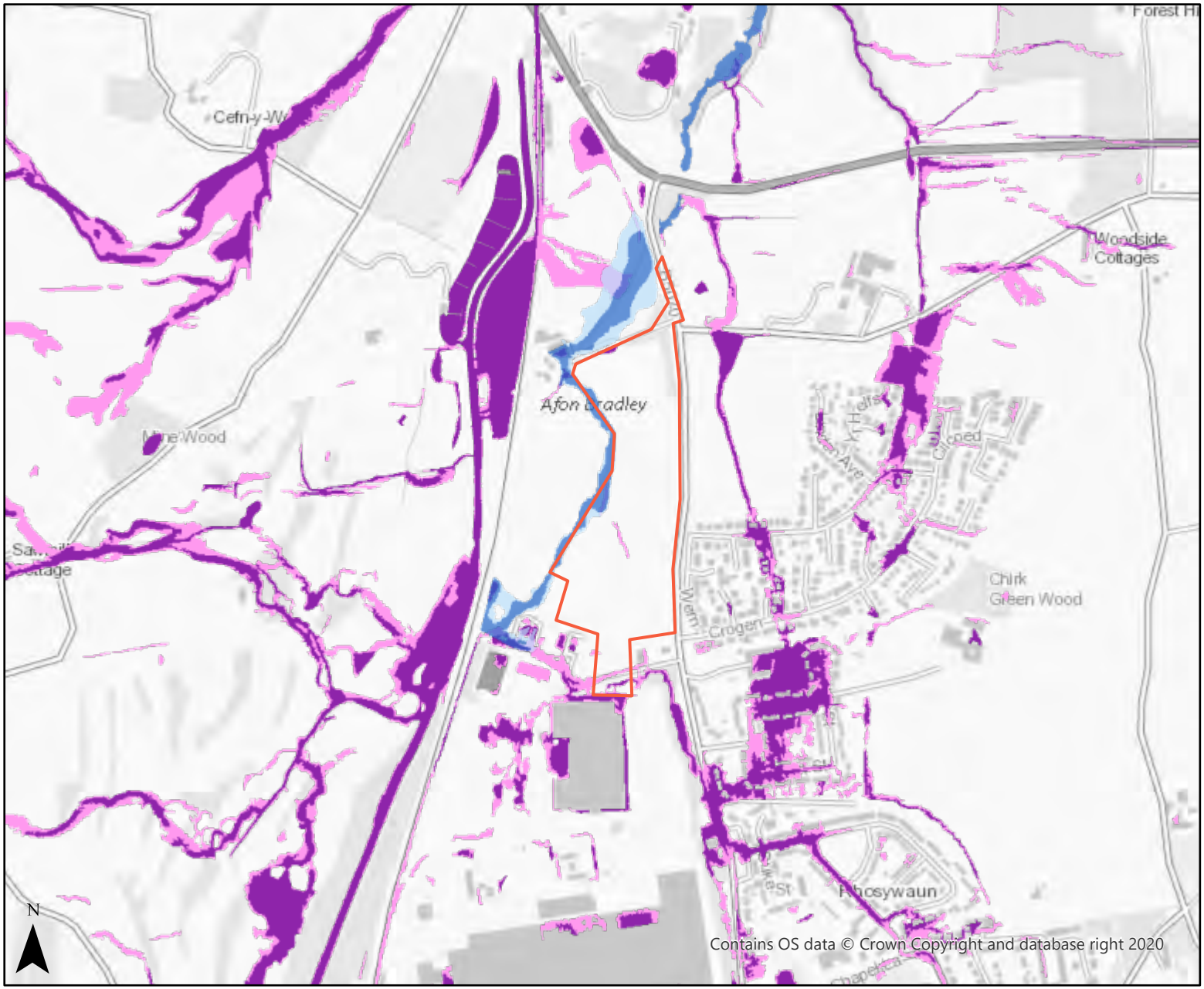
Project No:	Scale (@A1):	Drawn:	Date:
1620010941	1:500	DB	MAR 2022

Drawing No:	Rev:
KNA-RAM-01-60-DR-C-0010	P01

10/03/2022 15:20:49

APPENDIX 02

Flood Map for Planning



Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Map for Planning

Chirk

Legend

TAN15 Defended Zones

TAN15 Defended Zones

Rivers Rivers

Sea Sea

Rivers and Sea Rivers and Sea

Rivers and Sea

Rivers and Sea

Flood Zone 3 Flood Zone 3

Flood Zone 2 Flood Zone 2

Surface Water and Small Watercourses

Surface Water and Small Watercourses

Flood Zone 3 Flood Zone 3

Flood Zone 2 Flood Zone 2

Recorded Flood Extents

Recorded Flood Extents

Scale: 1:10,000

Date: 27/04/2022

0.45 0.23 0 0.45

km

British National Grid

APPENDIX 03

Pre-Development Surface Water Runoff Calculations

UK Design Flood Estimation

Generated on 26 April 2022 13:15:03 by chloenelson
Printed from the ReFH2 Flood Modelling software package, version 3.2.7650.24314

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details Checksum: 0FB2-0A84

Site name: FEH_Point_Descriptors_328669_338322

Easting: 328669

Northing: 338322

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

Model run: 1 year

Summary of results

Rainfall - FEH 2013 model (mm):	13.66	Total runoff (ML):	0.01
Total Rainfall (mm):	8.91	Total flow (ML):	0.05
Peak Rainfall (mm):	1.21	Peak flow (m³/s):	0.00

Parameters

Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.
** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	01:54:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.66	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No

Loss model parameters

Name	Value	User-defined?
Cini (mm)	71.62	No
Cmax (mm)	536.68	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0	No
BL (hr)	28.84	No
BR	2.89	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00:00	0.1008	0.0000	0.0135	0.0000	0.00015	0.00015
00:06:00	0.1360	0.0000	0.0182	0.0000	0.00015	0.000151
00:12:00	0.1833	0.0000	0.0246	0.0000	0.000149	0.000154
00:18:00	0.2467	0.0000	0.0332	0.0000	0.000149	0.000162
00:24:00	0.3313	0.0000	0.0447	0.0000	0.000148	0.000175
00:30:00	0.4436	0.0000	0.0602	0.0000	0.000148	0.000195
00:36:00	0.5919	0.0000	0.0809	0.0001	0.000148	0.000224
00:42:00	0.7851	0.0000	0.1083	0.0001	0.000149	0.000267
00:48:00	1.0284	0.0000	0.1436	0.0002	0.00015	0.000328
00:54:00	1.2148	0.0000	0.1722	0.0003	0.000151	0.000412
01:00:00	1.0284	0.0000	0.1479	0.0004	0.000154	0.000525
01:06:00	0.7851	0.0000	0.1143	0.0005	0.000158	0.000667
01:12:00	0.5919	0.0000	0.0869	0.0007	0.000163	0.000829
01:18:00	0.4436	0.0000	0.0656	0.0008	0.00017	0.001
01:24:00	0.3313	0.0000	0.0492	0.0010	0.000179	0.00119
01:30:00	0.2467	0.0000	0.0368	0.0012	0.000189	0.00137
01:36:00	0.1833	0.0000	0.0274	0.0013	0.000201	0.00155
01:42:00	0.1360	0.0000	0.0204	0.0015	0.000215	0.00172
01:48:00	0.1008	0.0000	0.0151	0.0016	0.00023	0.00186
01:54:00	0.0000	0.0000	0.0000	0.0017	0.000246	0.00197
02:00:00	0.0000	0.0000	0.0000	0.0018	0.000262	0.00204
02:06:00	0.0000	0.0000	0.0000	0.0018	0.000279	0.00206
02:12:00	0.0000	0.0000	0.0000	0.0018	0.000296	0.00205
02:18:00	0.0000	0.0000	0.0000	0.0017	0.000312	0.00201
02:24:00	0.0000	0.0000	0.0000	0.0016	0.000328	0.00195
02:30:00	0.0000	0.0000	0.0000	0.0015	0.000342	0.00187
02:36:00	0.0000	0.0000	0.0000	0.0014	0.000356	0.00179
02:42:00	0.0000	0.0000	0.0000	0.0013	0.000368	0.00169
02:48:00	0.0000	0.0000	0.0000	0.0012	0.00038	0.0016
02:54:00	0.0000	0.0000	0.0000	0.0011	0.00039	0.0015
03:00:00	0.0000	0.0000	0.0000	0.0010	0.000399	0.00142
03:06:00	0.0000	0.0000	0.0000	0.0009	0.000408	0.00134
03:12:00	0.0000	0.0000	0.0000	0.0008	0.000415	0.00126
03:18:00	0.0000	0.0000	0.0000	0.0008	0.000422	0.0012
03:24:00	0.0000	0.0000	0.0000	0.0007	0.000428	0.00113

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
03:30:00	0.0000	0.0000	0.0000	0.0006	0.000433	0.00107
03:36:00	0.0000	0.0000	0.0000	0.0006	0.000438	0.00101
03:42:00	0.0000	0.0000	0.0000	0.0005	0.000441	0.000952
03:48:00	0.0000	0.0000	0.0000	0.0005	0.000445	0.000896
03:54:00	0.0000	0.0000	0.0000	0.0004	0.000447	0.000841
04:00:00	0.0000	0.0000	0.0000	0.0003	0.00045	0.000787
04:06:00	0.0000	0.0000	0.0000	0.0003	0.000451	0.000735
04:12:00	0.0000	0.0000	0.0000	0.0002	0.000452	0.000685
04:18:00	0.0000	0.0000	0.0000	0.0002	0.000453	0.000637
04:24:00	0.0000	0.0000	0.0000	0.0001	0.000453	0.000593
04:30:00	0.0000	0.0000	0.0000	0.0001	0.000452	0.000555
04:36:00	0.0000	0.0000	0.0000	0.0001	0.000452	0.000525
04:42:00	0.0000	0.0000	0.0000	0.0001	0.000451	0.000501
04:48:00	0.0000	0.0000	0.0000	0.0000	0.00045	0.000483
04:54:00	0.0000	0.0000	0.0000	0.0000	0.000448	0.00047
05:00:00	0.0000	0.0000	0.0000	0.0000	0.000447	0.00046
05:06:00	0.0000	0.0000	0.0000	0.0000	0.000445	0.000453
05:12:00	0.0000	0.0000	0.0000	0.0000	0.000444	0.000448
05:18:00	0.0000	0.0000	0.0000	0.0000	0.000442	0.000444
05:24:00	0.0000	0.0000	0.0000	0.0000	0.000441	0.000441
05:30:00	0.0000	0.0000	0.0000	0.0000	0.000439	0.000439
05:36:00	0.0000	0.0000	0.0000	0.0000	0.000438	0.000438
05:42:00	0.0000	0.0000	0.0000	0.0000	0.000436	0.000436
05:48:00	0.0000	0.0000	0.0000	0.0000	0.000435	0.000435
05:54:00	0.0000	0.0000	0.0000	0.0000	0.000433	0.000433
06:00:00	0.0000	0.0000	0.0000	0.0000	0.000432	0.000432
06:06:00	0.0000	0.0000	0.0000	0.0000	0.00043	0.00043
06:12:00	0.0000	0.0000	0.0000	0.0000	0.000429	0.000429
06:18:00	0.0000	0.0000	0.0000	0.0000	0.000427	0.000427
06:24:00	0.0000	0.0000	0.0000	0.0000	0.000426	0.000426
06:30:00	0.0000	0.0000	0.0000	0.0000	0.000424	0.000424
06:36:00	0.0000	0.0000	0.0000	0.0000	0.000423	0.000423
06:42:00	0.0000	0.0000	0.0000	0.0000	0.000422	0.000422
06:48:00	0.0000	0.0000	0.0000	0.0000	0.00042	0.00042
06:54:00	0.0000	0.0000	0.0000	0.0000	0.000419	0.000419
07:00:00	0.0000	0.0000	0.0000	0.0000	0.000417	0.000417

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
07:06:00	0.0000	0.0000	0.0000	0.0000	0.000416	0.000416
07:12:00	0.0000	0.0000	0.0000	0.0000	0.000414	0.000414
07:18:00	0.0000	0.0000	0.0000	0.0000	0.000413	0.000413
07:24:00	0.0000	0.0000	0.0000	0.0000	0.000411	0.000411
07:30:00	0.0000	0.0000	0.0000	0.0000	0.00041	0.00041
07:36:00	0.0000	0.0000	0.0000	0.0000	0.000409	0.000409
07:42:00	0.0000	0.0000	0.0000	0.0000	0.000407	0.000407
07:48:00	0.0000	0.0000	0.0000	0.0000	0.000406	0.000406
07:54:00	0.0000	0.0000	0.0000	0.0000	0.000404	0.000404
08:00:00	0.0000	0.0000	0.0000	0.0000	0.000403	0.000403
08:06:00	0.0000	0.0000	0.0000	0.0000	0.000402	0.000402
08:12:00	0.0000	0.0000	0.0000	0.0000	0.0004	0.0004
08:18:00	0.0000	0.0000	0.0000	0.0000	0.000399	0.000399
08:24:00	0.0000	0.0000	0.0000	0.0000	0.000397	0.000397
08:30:00	0.0000	0.0000	0.0000	0.0000	0.000396	0.000396
08:36:00	0.0000	0.0000	0.0000	0.0000	0.000395	0.000395
08:42:00	0.0000	0.0000	0.0000	0.0000	0.000393	0.000393
08:48:00	0.0000	0.0000	0.0000	0.0000	0.000392	0.000392
08:54:00	0.0000	0.0000	0.0000	0.0000	0.000391	0.000391
09:00:00	0.0000	0.0000	0.0000	0.0000	0.000389	0.000389
09:06:00	0.0000	0.0000	0.0000	0.0000	0.000388	0.000388
09:12:00	0.0000	0.0000	0.0000	0.0000	0.000387	0.000387
09:18:00	0.0000	0.0000	0.0000	0.0000	0.000385	0.000385
09:24:00	0.0000	0.0000	0.0000	0.0000	0.000384	0.000384
09:30:00	0.0000	0.0000	0.0000	0.0000	0.000383	0.000383
09:36:00	0.0000	0.0000	0.0000	0.0000	0.000381	0.000381
09:42:00	0.0000	0.0000	0.0000	0.0000	0.00038	0.00038
09:48:00	0.0000	0.0000	0.0000	0.0000	0.000379	0.000379
09:54:00	0.0000	0.0000	0.0000	0.0000	0.000377	0.000377
10:00:00	0.0000	0.0000	0.0000	0.0000	0.000376	0.000376
10:06:00	0.0000	0.0000	0.0000	0.0000	0.000375	0.000375
10:12:00	0.0000	0.0000	0.0000	0.0000	0.000373	0.000373
10:18:00	0.0000	0.0000	0.0000	0.0000	0.000372	0.000372
10:24:00	0.0000	0.0000	0.0000	0.0000	0.000371	0.000371
10:30:00	0.0000	0.0000	0.0000	0.0000	0.00037	0.00037
10:36:00	0.0000	0.0000	0.0000	0.0000	0.000368	0.000368

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
10:42:00	0.0000	0.0000	0.0000	0.0000	0.000367	0.000367
10:48:00	0.0000	0.0000	0.0000	0.0000	0.000366	0.000366
10:54:00	0.0000	0.0000	0.0000	0.0000	0.000364	0.000364
11:00:00	0.0000	0.0000	0.0000	0.0000	0.000363	0.000363
11:06:00	0.0000	0.0000	0.0000	0.0000	0.000362	0.000362
11:12:00	0.0000	0.0000	0.0000	0.0000	0.000361	0.000361
11:18:00	0.0000	0.0000	0.0000	0.0000	0.000359	0.000359
11:24:00	0.0000	0.0000	0.0000	0.0000	0.000358	0.000358
11:30:00	0.0000	0.0000	0.0000	0.0000	0.000357	0.000357
11:36:00	0.0000	0.0000	0.0000	0.0000	0.000356	0.000356
11:42:00	0.0000	0.0000	0.0000	0.0000	0.000354	0.000354
11:48:00	0.0000	0.0000	0.0000	0.0000	0.000353	0.000353
11:54:00	0.0000	0.0000	0.0000	0.0000	0.000352	0.000352
12:00:00	0.0000	0.0000	0.0000	0.0000	0.000351	0.000351
12:06:00	0.0000	0.0000	0.0000	0.0000	0.00035	0.00035
12:12:00	0.0000	0.0000	0.0000	0.0000	0.000348	0.000348
12:18:00	0.0000	0.0000	0.0000	0.0000	0.000347	0.000347
12:24:00	0.0000	0.0000	0.0000	0.0000	0.000346	0.000346
12:30:00	0.0000	0.0000	0.0000	0.0000	0.000345	0.000345
12:36:00	0.0000	0.0000	0.0000	0.0000	0.000344	0.000344
12:42:00	0.0000	0.0000	0.0000	0.0000	0.000342	0.000342
12:48:00	0.0000	0.0000	0.0000	0.0000	0.000341	0.000341
12:54:00	0.0000	0.0000	0.0000	0.0000	0.00034	0.00034
13:00:00	0.0000	0.0000	0.0000	0.0000	0.000339	0.000339
13:06:00	0.0000	0.0000	0.0000	0.0000	0.000338	0.000338
13:12:00	0.0000	0.0000	0.0000	0.0000	0.000336	0.000336
13:18:00	0.0000	0.0000	0.0000	0.0000	0.000335	0.000335
13:24:00	0.0000	0.0000	0.0000	0.0000	0.000334	0.000334
13:30:00	0.0000	0.0000	0.0000	0.0000	0.000333	0.000333
13:36:00	0.0000	0.0000	0.0000	0.0000	0.000332	0.000332
13:42:00	0.0000	0.0000	0.0000	0.0000	0.000331	0.000331
13:48:00	0.0000	0.0000	0.0000	0.0000	0.00033	0.00033
13:54:00	0.0000	0.0000	0.0000	0.0000	0.000328	0.000328
14:00:00	0.0000	0.0000	0.0000	0.0000	0.000327	0.000327
14:06:00	0.0000	0.0000	0.0000	0.0000	0.000326	0.000326
14:12:00	0.0000	0.0000	0.0000	0.0000	0.000325	0.000325

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
14:18:00	0.0000	0.0000	0.0000	0.0000	0.000324	0.000324
14:24:00	0.0000	0.0000	0.0000	0.0000	0.000323	0.000323
14:30:00	0.0000	0.0000	0.0000	0.0000	0.000322	0.000322
14:36:00	0.0000	0.0000	0.0000	0.0000	0.000321	0.000321
14:42:00	0.0000	0.0000	0.0000	0.0000	0.000319	0.000319
14:48:00	0.0000	0.0000	0.0000	0.0000	0.000318	0.000318
14:54:00	0.0000	0.0000	0.0000	0.0000	0.000317	0.000317
15:00:00	0.0000	0.0000	0.0000	0.0000	0.000316	0.000316
15:06:00	0.0000	0.0000	0.0000	0.0000	0.000315	0.000315
15:12:00	0.0000	0.0000	0.0000	0.0000	0.000314	0.000314
15:18:00	0.0000	0.0000	0.0000	0.0000	0.000313	0.000313
15:24:00	0.0000	0.0000	0.0000	0.0000	0.000312	0.000312
15:30:00	0.0000	0.0000	0.0000	0.0000	0.000311	0.000311
15:36:00	0.0000	0.0000	0.0000	0.0000	0.00031	0.00031
15:42:00	0.0000	0.0000	0.0000	0.0000	0.000309	0.000309
15:48:00	0.0000	0.0000	0.0000	0.0000	0.000307	0.000307
15:54:00	0.0000	0.0000	0.0000	0.0000	0.000306	0.000306
16:00:00	0.0000	0.0000	0.0000	0.0000	0.000305	0.000305
16:06:00	0.0000	0.0000	0.0000	0.0000	0.000304	0.000304
16:12:00	0.0000	0.0000	0.0000	0.0000	0.000303	0.000303
16:18:00	0.0000	0.0000	0.0000	0.0000	0.000302	0.000302
16:24:00	0.0000	0.0000	0.0000	0.0000	0.000301	0.000301
16:30:00	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
16:36:00	0.0000	0.0000	0.0000	0.0000	0.000299	0.000299
16:42:00	0.0000	0.0000	0.0000	0.0000	0.000298	0.000298
16:48:00	0.0000	0.0000	0.0000	0.0000	0.000297	0.000297
16:54:00	0.0000	0.0000	0.0000	0.0000	0.000296	0.000296
17:00:00	0.0000	0.0000	0.0000	0.0000	0.000295	0.000295
17:06:00	0.0000	0.0000	0.0000	0.0000	0.000294	0.000294
17:12:00	0.0000	0.0000	0.0000	0.0000	0.000293	0.000293
17:18:00	0.0000	0.0000	0.0000	0.0000	0.000292	0.000292
17:24:00	0.0000	0.0000	0.0000	0.0000	0.000291	0.000291
17:30:00	0.0000	0.0000	0.0000	0.0000	0.00029	0.00029
17:36:00	0.0000	0.0000	0.0000	0.0000	0.000289	0.000289
17:42:00	0.0000	0.0000	0.0000	0.0000	0.000288	0.000288
17:48:00	0.0000	0.0000	0.0000	0.0000	0.000287	0.000287

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:54:00	0.0000	0.0000	0.0000	0.0000	0.000286	0.000286
18:00:00	0.0000	0.0000	0.0000	0.0000	0.000285	0.000285
18:06:00	0.0000	0.0000	0.0000	0.0000	0.000284	0.000284
18:12:00	0.0000	0.0000	0.0000	0.0000	0.000283	0.000283
18:18:00	0.0000	0.0000	0.0000	0.0000	0.000282	0.000282
18:24:00	0.0000	0.0000	0.0000	0.0000	0.000281	0.000281
18:30:00	0.0000	0.0000	0.0000	0.0000	0.00028	0.00028
18:36:00	0.0000	0.0000	0.0000	0.0000	0.000279	0.000279
18:42:00	0.0000	0.0000	0.0000	0.0000	0.000278	0.000278
18:48:00	0.0000	0.0000	0.0000	0.0000	0.000277	0.000277
18:54:00	0.0000	0.0000	0.0000	0.0000	0.000276	0.000276
19:00:00	0.0000	0.0000	0.0000	0.0000	0.000275	0.000275
19:06:00	0.0000	0.0000	0.0000	0.0000	0.000274	0.000274
19:12:00	0.0000	0.0000	0.0000	0.0000	0.000273	0.000273
19:18:00	0.0000	0.0000	0.0000	0.0000	0.000272	0.000272
19:24:00	0.0000	0.0000	0.0000	0.0000	0.000271	0.000271
19:30:00	0.0000	0.0000	0.0000	0.0000	0.00027	0.00027
19:36:00	0.0000	0.0000	0.0000	0.0000	0.00027	0.00027
19:42:00	0.0000	0.0000	0.0000	0.0000	0.000269	0.000269
19:48:00	0.0000	0.0000	0.0000	0.0000	0.000268	0.000268
19:54:00	0.0000	0.0000	0.0000	0.0000	0.000267	0.000267
20:00:00	0.0000	0.0000	0.0000	0.0000	0.000266	0.000266
20:06:00	0.0000	0.0000	0.0000	0.0000	0.000265	0.000265
20:12:00	0.0000	0.0000	0.0000	0.0000	0.000264	0.000264
20:18:00	0.0000	0.0000	0.0000	0.0000	0.000263	0.000263
20:24:00	0.0000	0.0000	0.0000	0.0000	0.000262	0.000262
20:30:00	0.0000	0.0000	0.0000	0.0000	0.000261	0.000261
20:36:00	0.0000	0.0000	0.0000	0.0000	0.00026	0.00026
20:42:00	0.0000	0.0000	0.0000	0.0000	0.000259	0.000259
20:48:00	0.0000	0.0000	0.0000	0.0000	0.000259	0.000259
20:54:00	0.0000	0.0000	0.0000	0.0000	0.000258	0.000258
21:00:00	0.0000	0.0000	0.0000	0.0000	0.000257	0.000257
21:06:00	0.0000	0.0000	0.0000	0.0000	0.000256	0.000256
21:12:00	0.0000	0.0000	0.0000	0.0000	0.000255	0.000255
21:18:00	0.0000	0.0000	0.0000	0.0000	0.000254	0.000254
21:24:00	0.0000	0.0000	0.0000	0.0000	0.000253	0.000253

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
21:30:00	0.0000	0.0000	0.0000	0.0000	0.000252	0.000252
21:36:00	0.0000	0.0000	0.0000	0.0000	0.000251	0.000251
21:42:00	0.0000	0.0000	0.0000	0.0000	0.000251	0.000251
21:48:00	0.0000	0.0000	0.0000	0.0000	0.00025	0.00025
21:54:00	0.0000	0.0000	0.0000	0.0000	0.000249	0.000249
22:00:00	0.0000	0.0000	0.0000	0.0000	0.000248	0.000248
22:06:00	0.0000	0.0000	0.0000	0.0000	0.000247	0.000247
22:12:00	0.0000	0.0000	0.0000	0.0000	0.000246	0.000246
22:18:00	0.0000	0.0000	0.0000	0.0000	0.000245	0.000245
22:24:00	0.0000	0.0000	0.0000	0.0000	0.000245	0.000245
22:30:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
22:36:00	0.0000	0.0000	0.0000	0.0000	0.000243	0.000243
22:42:00	0.0000	0.0000	0.0000	0.0000	0.000242	0.000242
22:48:00	0.0000	0.0000	0.0000	0.0000	0.000241	0.000241
22:54:00	0.0000	0.0000	0.0000	0.0000	0.00024	0.00024
23:00:00	0.0000	0.0000	0.0000	0.0000	0.00024	0.00024
23:06:00	0.0000	0.0000	0.0000	0.0000	0.000239	0.000239
23:12:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
23:18:00	0.0000	0.0000	0.0000	0.0000	0.000237	0.000237
23:24:00	0.0000	0.0000	0.0000	0.0000	0.000236	0.000236
23:30:00	0.0000	0.0000	0.0000	0.0000	0.000235	0.000235
23:36:00	0.0000	0.0000	0.0000	0.0000	0.000235	0.000235
23:42:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234
23:48:00	0.0000	0.0000	0.0000	0.0000	0.000233	0.000233
23:54:00	0.0000	0.0000	0.0000	0.0000	0.000232	0.000232
24:00:00	0.0000	0.0000	0.0000	0.0000	0.000231	0.000231
24:06:00	0.0000	0.0000	0.0000	0.0000	0.000231	0.000231
24:12:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
24:18:00	0.0000	0.0000	0.0000	0.0000	0.000229	0.000229
24:24:00	0.0000	0.0000	0.0000	0.0000	0.000228	0.000228
24:30:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
24:36:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
24:42:00	0.0000	0.0000	0.0000	0.0000	0.000226	0.000226
24:48:00	0.0000	0.0000	0.0000	0.0000	0.000225	0.000225
24:54:00	0.0000	0.0000	0.0000	0.0000	0.000224	0.000224
25:00:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
25:06:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
25:12:00	0.0000	0.0000	0.0000	0.0000	0.000222	0.000222
25:18:00	0.0000	0.0000	0.0000	0.0000	0.000221	0.000221
25:24:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
25:30:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
25:36:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
25:42:00	0.0000	0.0000	0.0000	0.0000	0.000218	0.000218
25:48:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
25:54:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
26:00:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
26:06:00	0.0000	0.0000	0.0000	0.0000	0.000215	0.000215
26:12:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
26:18:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
26:24:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
26:30:00	0.0000	0.0000	0.0000	0.0000	0.000212	0.000212
26:36:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
26:42:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
26:48:00	0.0000	0.0000	0.0000	0.0000	0.00021	0.00021
26:54:00	0.0000	0.0000	0.0000	0.0000	0.000209	0.000209
27:00:00	0.0000	0.0000	0.0000	0.0000	0.000209	0.000209
27:06:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
27:12:00	0.0000	0.0000	0.0000	0.0000	0.000207	0.000207
27:18:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
27:24:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
27:30:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
27:36:00	0.0000	0.0000	0.0000	0.0000	0.000204	0.000204
27:42:00	0.0000	0.0000	0.0000	0.0000	0.000204	0.000204
27:48:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
27:54:00	0.0000	0.0000	0.0000	0.0000	0.000202	0.000202
28:00:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
28:06:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
28:12:00	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
28:18:00	0.0000	0.0000	0.0000	0.0000	0.000199	0.000199
28:24:00	0.0000	0.0000	0.0000	0.0000	0.000199	0.000199
28:30:00	0.0000	0.0000	0.0000	0.0000	0.000198	0.000198
28:36:00	0.0000	0.0000	0.0000	0.0000	0.000197	0.000197

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
28:42:00	0.0000	0.0000	0.0000	0.0000	0.000197	0.000197
28:48:00	0.0000	0.0000	0.0000	0.0000	0.000196	0.000196
28:54:00	0.0000	0.0000	0.0000	0.0000	0.000195	0.000195
29:00:00	0.0000	0.0000	0.0000	0.0000	0.000195	0.000195
29:06:00	0.0000	0.0000	0.0000	0.0000	0.000194	0.000194
29:12:00	0.0000	0.0000	0.0000	0.0000	0.000193	0.000193
29:18:00	0.0000	0.0000	0.0000	0.0000	0.000193	0.000193
29:24:00	0.0000	0.0000	0.0000	0.0000	0.000192	0.000192
29:30:00	0.0000	0.0000	0.0000	0.0000	0.000191	0.000191
29:36:00	0.0000	0.0000	0.0000	0.0000	0.000191	0.000191
29:42:00	0.0000	0.0000	0.0000	0.0000	0.00019	0.00019
29:48:00	0.0000	0.0000	0.0000	0.0000	0.000189	0.000189
29:54:00	0.0000	0.0000	0.0000	0.0000	0.000189	0.000189
30:00:00	0.0000	0.0000	0.0000	0.0000	0.000188	0.000188
30:06:00	0.0000	0.0000	0.0000	0.0000	0.000187	0.000187
30:12:00	0.0000	0.0000	0.0000	0.0000	0.000187	0.000187
30:18:00	0.0000	0.0000	0.0000	0.0000	0.000186	0.000186
30:24:00	0.0000	0.0000	0.0000	0.0000	0.000185	0.000185
30:30:00	0.0000	0.0000	0.0000	0.0000	0.000185	0.000185
30:36:00	0.0000	0.0000	0.0000	0.0000	0.000184	0.000184
30:42:00	0.0000	0.0000	0.0000	0.0000	0.000183	0.000183
30:48:00	0.0000	0.0000	0.0000	0.0000	0.000183	0.000183
30:54:00	0.0000	0.0000	0.0000	0.0000	0.000182	0.000182
31:00:00	0.0000	0.0000	0.0000	0.0000	0.000182	0.000182
31:06:00	0.0000	0.0000	0.0000	0.0000	0.000181	0.000181
31:12:00	0.0000	0.0000	0.0000	0.0000	0.00018	0.00018
31:18:00	0.0000	0.0000	0.0000	0.0000	0.00018	0.00018
31:24:00	0.0000	0.0000	0.0000	0.0000	0.000179	0.000179
31:30:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
31:36:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
31:42:00	0.0000	0.0000	0.0000	0.0000	0.000177	0.000177
31:48:00	0.0000	0.0000	0.0000	0.0000	0.000177	0.000177
31:54:00	0.0000	0.0000	0.0000	0.0000	0.000176	0.000176
32:00:00	0.0000	0.0000	0.0000	0.0000	0.000175	0.000175
32:06:00	0.0000	0.0000	0.0000	0.0000	0.000175	0.000175
32:12:00	0.0000	0.0000	0.0000	0.0000	0.000174	0.000174

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
32:18:00	0.0000	0.0000	0.0000	0.0000	0.000174	0.000174
32:24:00	0.0000	0.0000	0.0000	0.0000	0.000173	0.000173
32:30:00	0.0000	0.0000	0.0000	0.0000	0.000172	0.000172
32:36:00	0.0000	0.0000	0.0000	0.0000	0.000172	0.000172
32:42:00	0.0000	0.0000	0.0000	0.0000	0.000171	0.000171
32:48:00	0.0000	0.0000	0.0000	0.0000	0.000171	0.000171
32:54:00	0.0000	0.0000	0.0000	0.0000	0.00017	0.00017
33:00:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
33:06:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
33:12:00	0.0000	0.0000	0.0000	0.0000	0.000168	0.000168
33:18:00	0.0000	0.0000	0.0000	0.0000	0.000168	0.000168
33:24:00	0.0000	0.0000	0.0000	0.0000	0.000167	0.000167
33:30:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
33:36:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
33:42:00	0.0000	0.0000	0.0000	0.0000	0.000165	0.000165
33:48:00	0.0000	0.0000	0.0000	0.0000	0.000165	0.000165
33:54:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
34:00:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
34:06:00	0.0000	0.0000	0.0000	0.0000	0.000163	0.000163
34:12:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
34:18:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
34:24:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161
34:30:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161
34:36:00	0.0000	0.0000	0.0000	0.0000	0.00016	0.00016
34:42:00	0.0000	0.0000	0.0000	0.0000	0.00016	0.00016
34:48:00	0.0000	0.0000	0.0000	0.0000	0.000159	0.000159
34:54:00	0.0000	0.0000	0.0000	0.0000	0.000159	0.000159
35:00:00	0.0000	0.0000	0.0000	0.0000	0.000158	0.000158
35:06:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
35:12:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
35:18:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
35:24:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
35:30:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
35:36:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
35:42:00	0.0000	0.0000	0.0000	0.0000	0.000154	0.000154
35:48:00	0.0000	0.0000	0.0000	0.0000	0.000154	0.000154

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:54:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
36:00:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
36:06:00	0.0000	0.0000	0.0000	0.0000	0.000152	0.000152
36:12:00	0.0000	0.0000	0.0000	0.0000	0.000152	0.000152
36:18:00	0.0000	0.0000	0.0000	0.0000	0.000151	0.000151

Appendix

Catchment descriptors

Name	Value	User-defined value used?
BFIHOST	0.63	No
BFIHOST19	0.64	No
PROPWET (mm)	0.51	No
SAAR (mm)	837	No

UK Design Flood Estimation

Generated on 26 April 2022 13:15:23 by chloenelson
Printed from the ReFH2 Flood Modelling software package, version 3.2.7650.24314

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details Checksum: 0FB2-0A84

Site name: FEH_Point_Descriptors_328669_338322

Easting: 328669

Northing: 338322

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

Model run: 2 year

Summary of results

Rainfall - FEH 2013 model (mm):	16.07	Total runoff (ML):	0.02
Total Rainfall (mm):	10.48	Total flow (ML):	0.06
Peak Rainfall (mm):	1.43	Peak flow (m³/s):	0.00

Parameters

Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.
** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	01:54:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.66	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No

Loss model parameters

Name	Value	User-defined?
Cini (mm)	71.62	No
Cmax (mm)	536.68	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0	No
BL (hr)	28.84	No
BR	2.89	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00:00	0.1185	0.0000	0.0158	0.0000	0.00015	0.00015
00:06:00	0.1600	0.0000	0.0214	0.0000	0.00015	0.000151
00:12:00	0.2156	0.0000	0.0289	0.0000	0.000149	0.000155
00:18:00	0.2901	0.0000	0.0391	0.0000	0.000149	0.000164
00:24:00	0.3896	0.0000	0.0527	0.0000	0.000148	0.000179
00:30:00	0.5217	0.0000	0.0710	0.0001	0.000148	0.000203
00:36:00	0.6961	0.0000	0.0955	0.0001	0.000148	0.000238
00:42:00	0.9233	0.0000	0.1281	0.0001	0.000149	0.000289
00:48:00	1.2095	0.0000	0.1702	0.0002	0.00015	0.00036
00:54:00	1.4286	0.0000	0.2046	0.0003	0.000152	0.000459
01:00:00	1.2095	0.0000	0.1762	0.0004	0.000156	0.000593
01:06:00	0.9233	0.0000	0.1363	0.0006	0.00016	0.000761
01:12:00	0.6961	0.0000	0.1038	0.0008	0.000167	0.000953
01:18:00	0.5217	0.0000	0.0784	0.0010	0.000175	0.00116
01:24:00	0.3896	0.0000	0.0589	0.0012	0.000185	0.00138
01:30:00	0.2901	0.0000	0.0440	0.0014	0.000198	0.0016
01:36:00	0.2156	0.0000	0.0328	0.0016	0.000212	0.00181
01:42:00	0.1600	0.0000	0.0244	0.0018	0.000228	0.00201
01:48:00	0.1185	0.0000	0.0181	0.0019	0.000246	0.00218
01:54:00	0.0000	0.0000	0.0000	0.0020	0.000265	0.00231
02:00:00	0.0000	0.0000	0.0000	0.0021	0.000285	0.0024
02:06:00	0.0000	0.0000	0.0000	0.0021	0.000305	0.00243
02:12:00	0.0000	0.0000	0.0000	0.0021	0.000325	0.00241
02:18:00	0.0000	0.0000	0.0000	0.0020	0.000344	0.00236
02:24:00	0.0000	0.0000	0.0000	0.0019	0.000363	0.00229
02:30:00	0.0000	0.0000	0.0000	0.0018	0.00038	0.0022
02:36:00	0.0000	0.0000	0.0000	0.0017	0.000397	0.0021
02:42:00	0.0000	0.0000	0.0000	0.0016	0.000412	0.00199
02:48:00	0.0000	0.0000	0.0000	0.0014	0.000425	0.00187
02:54:00	0.0000	0.0000	0.0000	0.0013	0.000438	0.00176
03:00:00	0.0000	0.0000	0.0000	0.0012	0.000449	0.00166
03:06:00	0.0000	0.0000	0.0000	0.0011	0.000459	0.00156
03:12:00	0.0000	0.0000	0.0000	0.0010	0.000468	0.00148
03:18:00	0.0000	0.0000	0.0000	0.0009	0.000476	0.0014
03:24:00	0.0000	0.0000	0.0000	0.0008	0.000483	0.00132

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
03:30:00	0.0000	0.0000	0.0000	0.0008	0.000489	0.00125
03:36:00	0.0000	0.0000	0.0000	0.0007	0.000495	0.00118
03:42:00	0.0000	0.0000	0.0000	0.0006	0.0005	0.00111
03:48:00	0.0000	0.0000	0.0000	0.0005	0.000504	0.00104
03:54:00	0.0000	0.0000	0.0000	0.0005	0.000507	0.000976
04:00:00	0.0000	0.0000	0.0000	0.0004	0.00051	0.000912
04:06:00	0.0000	0.0000	0.0000	0.0003	0.000511	0.00085
04:12:00	0.0000	0.0000	0.0000	0.0003	0.000513	0.00079
04:18:00	0.0000	0.0000	0.0000	0.0002	0.000513	0.000734
04:24:00	0.0000	0.0000	0.0000	0.0002	0.000514	0.000682
04:30:00	0.0000	0.0000	0.0000	0.0001	0.000513	0.000637
04:36:00	0.0000	0.0000	0.0000	0.0001	0.000513	0.0006
04:42:00	0.0000	0.0000	0.0000	0.0001	0.000512	0.000572
04:48:00	0.0000	0.0000	0.0000	0.0000	0.00051	0.000551
04:54:00	0.0000	0.0000	0.0000	0.0000	0.000509	0.000535
05:00:00	0.0000	0.0000	0.0000	0.0000	0.000507	0.000523
05:06:00	0.0000	0.0000	0.0000	0.0000	0.000506	0.000515
05:12:00	0.0000	0.0000	0.0000	0.0000	0.000504	0.000508
05:18:00	0.0000	0.0000	0.0000	0.0000	0.000502	0.000504
05:24:00	0.0000	0.0000	0.0000	0.0000	0.000501	0.000501
05:30:00	0.0000	0.0000	0.0000	0.0000	0.000499	0.000499
05:36:00	0.0000	0.0000	0.0000	0.0000	0.000497	0.000497
05:42:00	0.0000	0.0000	0.0000	0.0000	0.000495	0.000495
05:48:00	0.0000	0.0000	0.0000	0.0000	0.000494	0.000494
05:54:00	0.0000	0.0000	0.0000	0.0000	0.000492	0.000492
06:00:00	0.0000	0.0000	0.0000	0.0000	0.00049	0.00049
06:06:00	0.0000	0.0000	0.0000	0.0000	0.000489	0.000489
06:12:00	0.0000	0.0000	0.0000	0.0000	0.000487	0.000487
06:18:00	0.0000	0.0000	0.0000	0.0000	0.000485	0.000485
06:24:00	0.0000	0.0000	0.0000	0.0000	0.000483	0.000483
06:30:00	0.0000	0.0000	0.0000	0.0000	0.000482	0.000482
06:36:00	0.0000	0.0000	0.0000	0.0000	0.00048	0.00048
06:42:00	0.0000	0.0000	0.0000	0.0000	0.000478	0.000478
06:48:00	0.0000	0.0000	0.0000	0.0000	0.000477	0.000477
06:54:00	0.0000	0.0000	0.0000	0.0000	0.000475	0.000475
07:00:00	0.0000	0.0000	0.0000	0.0000	0.000474	0.000474

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
07:06:00	0.0000	0.0000	0.0000	0.0000	0.000472	0.000472
07:12:00	0.0000	0.0000	0.0000	0.0000	0.00047	0.00047
07:18:00	0.0000	0.0000	0.0000	0.0000	0.000469	0.000469
07:24:00	0.0000	0.0000	0.0000	0.0000	0.000467	0.000467
07:30:00	0.0000	0.0000	0.0000	0.0000	0.000465	0.000465
07:36:00	0.0000	0.0000	0.0000	0.0000	0.000464	0.000464
07:42:00	0.0000	0.0000	0.0000	0.0000	0.000462	0.000462
07:48:00	0.0000	0.0000	0.0000	0.0000	0.000461	0.000461
07:54:00	0.0000	0.0000	0.0000	0.0000	0.000459	0.000459
08:00:00	0.0000	0.0000	0.0000	0.0000	0.000457	0.000457
08:06:00	0.0000	0.0000	0.0000	0.0000	0.000456	0.000456
08:12:00	0.0000	0.0000	0.0000	0.0000	0.000454	0.000454
08:18:00	0.0000	0.0000	0.0000	0.0000	0.000453	0.000453
08:24:00	0.0000	0.0000	0.0000	0.0000	0.000451	0.000451
08:30:00	0.0000	0.0000	0.0000	0.0000	0.00045	0.00045
08:36:00	0.0000	0.0000	0.0000	0.0000	0.000448	0.000448
08:42:00	0.0000	0.0000	0.0000	0.0000	0.000446	0.000446
08:48:00	0.0000	0.0000	0.0000	0.0000	0.000445	0.000445
08:54:00	0.0000	0.0000	0.0000	0.0000	0.000443	0.000443
09:00:00	0.0000	0.0000	0.0000	0.0000	0.000442	0.000442
09:06:00	0.0000	0.0000	0.0000	0.0000	0.00044	0.00044
09:12:00	0.0000	0.0000	0.0000	0.0000	0.000439	0.000439
09:18:00	0.0000	0.0000	0.0000	0.0000	0.000437	0.000437
09:24:00	0.0000	0.0000	0.0000	0.0000	0.000436	0.000436
09:30:00	0.0000	0.0000	0.0000	0.0000	0.000434	0.000434
09:36:00	0.0000	0.0000	0.0000	0.0000	0.000433	0.000433
09:42:00	0.0000	0.0000	0.0000	0.0000	0.000431	0.000431
09:48:00	0.0000	0.0000	0.0000	0.0000	0.00043	0.00043
09:54:00	0.0000	0.0000	0.0000	0.0000	0.000428	0.000428
10:00:00	0.0000	0.0000	0.0000	0.0000	0.000427	0.000427
10:06:00	0.0000	0.0000	0.0000	0.0000	0.000425	0.000425
10:12:00	0.0000	0.0000	0.0000	0.0000	0.000424	0.000424
10:18:00	0.0000	0.0000	0.0000	0.0000	0.000422	0.000422
10:24:00	0.0000	0.0000	0.0000	0.0000	0.000421	0.000421
10:30:00	0.0000	0.0000	0.0000	0.0000	0.000419	0.000419
10:36:00	0.0000	0.0000	0.0000	0.0000	0.000418	0.000418

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
10:42:00	0.0000	0.0000	0.0000	0.0000	0.000417	0.000417
10:48:00	0.0000	0.0000	0.0000	0.0000	0.000415	0.000415
10:54:00	0.0000	0.0000	0.0000	0.0000	0.000414	0.000414
11:00:00	0.0000	0.0000	0.0000	0.0000	0.000412	0.000412
11:06:00	0.0000	0.0000	0.0000	0.0000	0.000411	0.000411
11:12:00	0.0000	0.0000	0.0000	0.0000	0.000409	0.000409
11:18:00	0.0000	0.0000	0.0000	0.0000	0.000408	0.000408
11:24:00	0.0000	0.0000	0.0000	0.0000	0.000407	0.000407
11:30:00	0.0000	0.0000	0.0000	0.0000	0.000405	0.000405
11:36:00	0.0000	0.0000	0.0000	0.0000	0.000404	0.000404
11:42:00	0.0000	0.0000	0.0000	0.0000	0.000402	0.000402
11:48:00	0.0000	0.0000	0.0000	0.0000	0.000401	0.000401
11:54:00	0.0000	0.0000	0.0000	0.0000	0.0004	0.0004
12:00:00	0.0000	0.0000	0.0000	0.0000	0.000398	0.000398
12:06:00	0.0000	0.0000	0.0000	0.0000	0.000397	0.000397
12:12:00	0.0000	0.0000	0.0000	0.0000	0.000395	0.000395
12:18:00	0.0000	0.0000	0.0000	0.0000	0.000394	0.000394
12:24:00	0.0000	0.0000	0.0000	0.0000	0.000393	0.000393
12:30:00	0.0000	0.0000	0.0000	0.0000	0.000391	0.000391
12:36:00	0.0000	0.0000	0.0000	0.0000	0.00039	0.00039
12:42:00	0.0000	0.0000	0.0000	0.0000	0.000389	0.000389
12:48:00	0.0000	0.0000	0.0000	0.0000	0.000387	0.000387
12:54:00	0.0000	0.0000	0.0000	0.0000	0.000386	0.000386
13:00:00	0.0000	0.0000	0.0000	0.0000	0.000385	0.000385
13:06:00	0.0000	0.0000	0.0000	0.0000	0.000383	0.000383
13:12:00	0.0000	0.0000	0.0000	0.0000	0.000382	0.000382
13:18:00	0.0000	0.0000	0.0000	0.0000	0.000381	0.000381
13:24:00	0.0000	0.0000	0.0000	0.0000	0.000379	0.000379
13:30:00	0.0000	0.0000	0.0000	0.0000	0.000378	0.000378
13:36:00	0.0000	0.0000	0.0000	0.0000	0.000377	0.000377
13:42:00	0.0000	0.0000	0.0000	0.0000	0.000375	0.000375
13:48:00	0.0000	0.0000	0.0000	0.0000	0.000374	0.000374
13:54:00	0.0000	0.0000	0.0000	0.0000	0.000373	0.000373
14:00:00	0.0000	0.0000	0.0000	0.0000	0.000371	0.000371
14:06:00	0.0000	0.0000	0.0000	0.0000	0.00037	0.00037
14:12:00	0.0000	0.0000	0.0000	0.0000	0.000369	0.000369

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
14:18:00	0.0000	0.0000	0.0000	0.0000	0.000368	0.000368
14:24:00	0.0000	0.0000	0.0000	0.0000	0.000366	0.000366
14:30:00	0.0000	0.0000	0.0000	0.0000	0.000365	0.000365
14:36:00	0.0000	0.0000	0.0000	0.0000	0.000364	0.000364
14:42:00	0.0000	0.0000	0.0000	0.0000	0.000363	0.000363
14:48:00	0.0000	0.0000	0.0000	0.0000	0.000361	0.000361
14:54:00	0.0000	0.0000	0.0000	0.0000	0.00036	0.00036
15:00:00	0.0000	0.0000	0.0000	0.0000	0.000359	0.000359
15:06:00	0.0000	0.0000	0.0000	0.0000	0.000358	0.000358
15:12:00	0.0000	0.0000	0.0000	0.0000	0.000356	0.000356
15:18:00	0.0000	0.0000	0.0000	0.0000	0.000355	0.000355
15:24:00	0.0000	0.0000	0.0000	0.0000	0.000354	0.000354
15:30:00	0.0000	0.0000	0.0000	0.0000	0.000353	0.000353
15:36:00	0.0000	0.0000	0.0000	0.0000	0.000351	0.000351
15:42:00	0.0000	0.0000	0.0000	0.0000	0.00035	0.00035
15:48:00	0.0000	0.0000	0.0000	0.0000	0.000349	0.000349
15:54:00	0.0000	0.0000	0.0000	0.0000	0.000348	0.000348
16:00:00	0.0000	0.0000	0.0000	0.0000	0.000347	0.000347
16:06:00	0.0000	0.0000	0.0000	0.0000	0.000345	0.000345
16:12:00	0.0000	0.0000	0.0000	0.0000	0.000344	0.000344
16:18:00	0.0000	0.0000	0.0000	0.0000	0.000343	0.000343
16:24:00	0.0000	0.0000	0.0000	0.0000	0.000342	0.000342
16:30:00	0.0000	0.0000	0.0000	0.0000	0.000341	0.000341
16:36:00	0.0000	0.0000	0.0000	0.0000	0.000339	0.000339
16:42:00	0.0000	0.0000	0.0000	0.0000	0.000338	0.000338
16:48:00	0.0000	0.0000	0.0000	0.0000	0.000337	0.000337
16:54:00	0.0000	0.0000	0.0000	0.0000	0.000336	0.000336
17:00:00	0.0000	0.0000	0.0000	0.0000	0.000335	0.000335
17:06:00	0.0000	0.0000	0.0000	0.0000	0.000334	0.000334
17:12:00	0.0000	0.0000	0.0000	0.0000	0.000332	0.000332
17:18:00	0.0000	0.0000	0.0000	0.0000	0.000331	0.000331
17:24:00	0.0000	0.0000	0.0000	0.0000	0.00033	0.00033
17:30:00	0.0000	0.0000	0.0000	0.0000	0.000329	0.000329
17:36:00	0.0000	0.0000	0.0000	0.0000	0.000328	0.000328
17:42:00	0.0000	0.0000	0.0000	0.0000	0.000327	0.000327
17:48:00	0.0000	0.0000	0.0000	0.0000	0.000326	0.000326

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:54:00	0.0000	0.0000	0.0000	0.0000	0.000325	0.000325
18:00:00	0.0000	0.0000	0.0000	0.0000	0.000323	0.000323
18:06:00	0.0000	0.0000	0.0000	0.0000	0.000322	0.000322
18:12:00	0.0000	0.0000	0.0000	0.0000	0.000321	0.000321
18:18:00	0.0000	0.0000	0.0000	0.0000	0.00032	0.00032
18:24:00	0.0000	0.0000	0.0000	0.0000	0.000319	0.000319
18:30:00	0.0000	0.0000	0.0000	0.0000	0.000318	0.000318
18:36:00	0.0000	0.0000	0.0000	0.0000	0.000317	0.000317
18:42:00	0.0000	0.0000	0.0000	0.0000	0.000316	0.000316
18:48:00	0.0000	0.0000	0.0000	0.0000	0.000315	0.000315
18:54:00	0.0000	0.0000	0.0000	0.0000	0.000313	0.000313
19:00:00	0.0000	0.0000	0.0000	0.0000	0.000312	0.000312
19:06:00	0.0000	0.0000	0.0000	0.0000	0.000311	0.000311
19:12:00	0.0000	0.0000	0.0000	0.0000	0.00031	0.00031
19:18:00	0.0000	0.0000	0.0000	0.0000	0.000309	0.000309
19:24:00	0.0000	0.0000	0.0000	0.0000	0.000308	0.000308
19:30:00	0.0000	0.0000	0.0000	0.0000	0.000307	0.000307
19:36:00	0.0000	0.0000	0.0000	0.0000	0.000306	0.000306
19:42:00	0.0000	0.0000	0.0000	0.0000	0.000305	0.000305
19:48:00	0.0000	0.0000	0.0000	0.0000	0.000304	0.000304
19:54:00	0.0000	0.0000	0.0000	0.0000	0.000303	0.000303
20:00:00	0.0000	0.0000	0.0000	0.0000	0.000302	0.000302
20:06:00	0.0000	0.0000	0.0000	0.0000	0.000301	0.000301
20:12:00	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
20:18:00	0.0000	0.0000	0.0000	0.0000	0.000299	0.000299
20:24:00	0.0000	0.0000	0.0000	0.0000	0.000298	0.000298
20:30:00	0.0000	0.0000	0.0000	0.0000	0.000297	0.000297
20:36:00	0.0000	0.0000	0.0000	0.0000	0.000296	0.000296
20:42:00	0.0000	0.0000	0.0000	0.0000	0.000294	0.000294
20:48:00	0.0000	0.0000	0.0000	0.0000	0.000293	0.000293
20:54:00	0.0000	0.0000	0.0000	0.0000	0.000292	0.000292
21:00:00	0.0000	0.0000	0.0000	0.0000	0.000291	0.000291
21:06:00	0.0000	0.0000	0.0000	0.0000	0.00029	0.00029
21:12:00	0.0000	0.0000	0.0000	0.0000	0.000289	0.000289
21:18:00	0.0000	0.0000	0.0000	0.0000	0.000288	0.000288
21:24:00	0.0000	0.0000	0.0000	0.0000	0.000287	0.000287

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
21:30:00	0.0000	0.0000	0.0000	0.0000	0.000286	0.000286
21:36:00	0.0000	0.0000	0.0000	0.0000	0.000285	0.000285
21:42:00	0.0000	0.0000	0.0000	0.0000	0.000284	0.000284
21:48:00	0.0000	0.0000	0.0000	0.0000	0.000283	0.000283
21:54:00	0.0000	0.0000	0.0000	0.0000	0.000282	0.000282
22:00:00	0.0000	0.0000	0.0000	0.0000	0.000282	0.000282
22:06:00	0.0000	0.0000	0.0000	0.0000	0.000281	0.000281
22:12:00	0.0000	0.0000	0.0000	0.0000	0.00028	0.00028
22:18:00	0.0000	0.0000	0.0000	0.0000	0.000279	0.000279
22:24:00	0.0000	0.0000	0.0000	0.0000	0.000278	0.000278
22:30:00	0.0000	0.0000	0.0000	0.0000	0.000277	0.000277
22:36:00	0.0000	0.0000	0.0000	0.0000	0.000276	0.000276
22:42:00	0.0000	0.0000	0.0000	0.0000	0.000275	0.000275
22:48:00	0.0000	0.0000	0.0000	0.0000	0.000274	0.000274
22:54:00	0.0000	0.0000	0.0000	0.0000	0.000273	0.000273
23:00:00	0.0000	0.0000	0.0000	0.0000	0.000272	0.000272
23:06:00	0.0000	0.0000	0.0000	0.0000	0.000271	0.000271
23:12:00	0.0000	0.0000	0.0000	0.0000	0.00027	0.00027
23:18:00	0.0000	0.0000	0.0000	0.0000	0.000269	0.000269
23:24:00	0.0000	0.0000	0.0000	0.0000	0.000268	0.000268
23:30:00	0.0000	0.0000	0.0000	0.0000	0.000267	0.000267
23:36:00	0.0000	0.0000	0.0000	0.0000	0.000266	0.000266
23:42:00	0.0000	0.0000	0.0000	0.0000	0.000265	0.000265
23:48:00	0.0000	0.0000	0.0000	0.0000	0.000264	0.000264
23:54:00	0.0000	0.0000	0.0000	0.0000	0.000264	0.000264
24:00:00	0.0000	0.0000	0.0000	0.0000	0.000263	0.000263
24:06:00	0.0000	0.0000	0.0000	0.0000	0.000262	0.000262
24:12:00	0.0000	0.0000	0.0000	0.0000	0.000261	0.000261
24:18:00	0.0000	0.0000	0.0000	0.0000	0.00026	0.00026
24:24:00	0.0000	0.0000	0.0000	0.0000	0.000259	0.000259
24:30:00	0.0000	0.0000	0.0000	0.0000	0.000258	0.000258
24:36:00	0.0000	0.0000	0.0000	0.0000	0.000257	0.000257
24:42:00	0.0000	0.0000	0.0000	0.0000	0.000256	0.000256
24:48:00	0.0000	0.0000	0.0000	0.0000	0.000255	0.000255
24:54:00	0.0000	0.0000	0.0000	0.0000	0.000255	0.000255
25:00:00	0.0000	0.0000	0.0000	0.0000	0.000254	0.000254

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
25:06:00	0.0000	0.0000	0.0000	0.0000	0.000253	0.000253
25:12:00	0.0000	0.0000	0.0000	0.0000	0.000252	0.000252
25:18:00	0.0000	0.0000	0.0000	0.0000	0.000251	0.000251
25:24:00	0.0000	0.0000	0.0000	0.0000	0.00025	0.00025
25:30:00	0.0000	0.0000	0.0000	0.0000	0.000249	0.000249
25:36:00	0.0000	0.0000	0.0000	0.0000	0.000248	0.000248
25:42:00	0.0000	0.0000	0.0000	0.0000	0.000248	0.000248
25:48:00	0.0000	0.0000	0.0000	0.0000	0.000247	0.000247
25:54:00	0.0000	0.0000	0.0000	0.0000	0.000246	0.000246
26:00:00	0.0000	0.0000	0.0000	0.0000	0.000245	0.000245
26:06:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
26:12:00	0.0000	0.0000	0.0000	0.0000	0.000243	0.000243
26:18:00	0.0000	0.0000	0.0000	0.0000	0.000243	0.000243
26:24:00	0.0000	0.0000	0.0000	0.0000	0.000242	0.000242
26:30:00	0.0000	0.0000	0.0000	0.0000	0.000241	0.000241
26:36:00	0.0000	0.0000	0.0000	0.0000	0.00024	0.00024
26:42:00	0.0000	0.0000	0.0000	0.0000	0.000239	0.000239
26:48:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
26:54:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
27:00:00	0.0000	0.0000	0.0000	0.0000	0.000237	0.000237
27:06:00	0.0000	0.0000	0.0000	0.0000	0.000236	0.000236
27:12:00	0.0000	0.0000	0.0000	0.0000	0.000235	0.000235
27:18:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234
27:24:00	0.0000	0.0000	0.0000	0.0000	0.000233	0.000233
27:30:00	0.0000	0.0000	0.0000	0.0000	0.000233	0.000233
27:36:00	0.0000	0.0000	0.0000	0.0000	0.000232	0.000232
27:42:00	0.0000	0.0000	0.0000	0.0000	0.000231	0.000231
27:48:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
27:54:00	0.0000	0.0000	0.0000	0.0000	0.000229	0.000229
28:00:00	0.0000	0.0000	0.0000	0.0000	0.000229	0.000229
28:06:00	0.0000	0.0000	0.0000	0.0000	0.000228	0.000228
28:12:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
28:18:00	0.0000	0.0000	0.0000	0.0000	0.000226	0.000226
28:24:00	0.0000	0.0000	0.0000	0.0000	0.000225	0.000225
28:30:00	0.0000	0.0000	0.0000	0.0000	0.000225	0.000225
28:36:00	0.0000	0.0000	0.0000	0.0000	0.000224	0.000224

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
28:42:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
28:48:00	0.0000	0.0000	0.0000	0.0000	0.000222	0.000222
28:54:00	0.0000	0.0000	0.0000	0.0000	0.000222	0.000222
29:00:00	0.0000	0.0000	0.0000	0.0000	0.000221	0.000221
29:06:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
29:12:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
29:18:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
29:24:00	0.0000	0.0000	0.0000	0.0000	0.000218	0.000218
29:30:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
29:36:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
29:42:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
29:48:00	0.0000	0.0000	0.0000	0.0000	0.000215	0.000215
29:54:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
30:00:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
30:06:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
30:12:00	0.0000	0.0000	0.0000	0.0000	0.000212	0.000212
30:18:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
30:24:00	0.0000	0.0000	0.0000	0.0000	0.00021	0.00021
30:30:00	0.0000	0.0000	0.0000	0.0000	0.00021	0.00021
30:36:00	0.0000	0.0000	0.0000	0.0000	0.000209	0.000209
30:42:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
30:48:00	0.0000	0.0000	0.0000	0.0000	0.000207	0.000207
30:54:00	0.0000	0.0000	0.0000	0.0000	0.000207	0.000207
31:00:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
31:06:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
31:12:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
31:18:00	0.0000	0.0000	0.0000	0.0000	0.000204	0.000204
31:24:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
31:30:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
31:36:00	0.0000	0.0000	0.0000	0.0000	0.000202	0.000202
31:42:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
31:48:00	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
31:54:00	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
32:00:00	0.0000	0.0000	0.0000	0.0000	0.000199	0.000199
32:06:00	0.0000	0.0000	0.0000	0.0000	0.000198	0.000198
32:12:00	0.0000	0.0000	0.0000	0.0000	0.000198	0.000198

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
32:18:00	0.0000	0.0000	0.0000	0.0000	0.000197	0.000197
32:24:00	0.0000	0.0000	0.0000	0.0000	0.000196	0.000196
32:30:00	0.0000	0.0000	0.0000	0.0000	0.000196	0.000196
32:36:00	0.0000	0.0000	0.0000	0.0000	0.000195	0.000195
32:42:00	0.0000	0.0000	0.0000	0.0000	0.000194	0.000194
32:48:00	0.0000	0.0000	0.0000	0.0000	0.000194	0.000194
32:54:00	0.0000	0.0000	0.0000	0.0000	0.000193	0.000193
33:00:00	0.0000	0.0000	0.0000	0.0000	0.000192	0.000192
33:06:00	0.0000	0.0000	0.0000	0.0000	0.000192	0.000192
33:12:00	0.0000	0.0000	0.0000	0.0000	0.000191	0.000191
33:18:00	0.0000	0.0000	0.0000	0.0000	0.00019	0.00019
33:24:00	0.0000	0.0000	0.0000	0.0000	0.00019	0.00019
33:30:00	0.0000	0.0000	0.0000	0.0000	0.000189	0.000189
33:36:00	0.0000	0.0000	0.0000	0.0000	0.000188	0.000188
33:42:00	0.0000	0.0000	0.0000	0.0000	0.000188	0.000188
33:48:00	0.0000	0.0000	0.0000	0.0000	0.000187	0.000187
33:54:00	0.0000	0.0000	0.0000	0.0000	0.000186	0.000186
34:00:00	0.0000	0.0000	0.0000	0.0000	0.000186	0.000186
34:06:00	0.0000	0.0000	0.0000	0.0000	0.000185	0.000185
34:12:00	0.0000	0.0000	0.0000	0.0000	0.000184	0.000184
34:18:00	0.0000	0.0000	0.0000	0.0000	0.000184	0.000184
34:24:00	0.0000	0.0000	0.0000	0.0000	0.000183	0.000183
34:30:00	0.0000	0.0000	0.0000	0.0000	0.000182	0.000182
34:36:00	0.0000	0.0000	0.0000	0.0000	0.000182	0.000182
34:42:00	0.0000	0.0000	0.0000	0.0000	0.000181	0.000181
34:48:00	0.0000	0.0000	0.0000	0.0000	0.000181	0.000181
34:54:00	0.0000	0.0000	0.0000	0.0000	0.00018	0.00018
35:00:00	0.0000	0.0000	0.0000	0.0000	0.000179	0.000179
35:06:00	0.0000	0.0000	0.0000	0.0000	0.000179	0.000179
35:12:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
35:18:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
35:24:00	0.0000	0.0000	0.0000	0.0000	0.000177	0.000177
35:30:00	0.0000	0.0000	0.0000	0.0000	0.000176	0.000176
35:36:00	0.0000	0.0000	0.0000	0.0000	0.000176	0.000176
35:42:00	0.0000	0.0000	0.0000	0.0000	0.000175	0.000175
35:48:00	0.0000	0.0000	0.0000	0.0000	0.000174	0.000174

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:54:00	0.0000	0.0000	0.0000	0.0000	0.000174	0.000174
36:00:00	0.0000	0.0000	0.0000	0.0000	0.000173	0.000173
36:06:00	0.0000	0.0000	0.0000	0.0000	0.000173	0.000173
36:12:00	0.0000	0.0000	0.0000	0.0000	0.000172	0.000172
36:18:00	0.0000	0.0000	0.0000	0.0000	0.000171	0.000171
36:24:00	0.0000	0.0000	0.0000	0.0000	0.000171	0.000171
36:30:00	0.0000	0.0000	0.0000	0.0000	0.00017	0.00017
36:36:00	0.0000	0.0000	0.0000	0.0000	0.00017	0.00017
36:42:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
36:48:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
36:54:00	0.0000	0.0000	0.0000	0.0000	0.000168	0.000168
37:00:00	0.0000	0.0000	0.0000	0.0000	0.000167	0.000167
37:06:00	0.0000	0.0000	0.0000	0.0000	0.000167	0.000167
37:12:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
37:18:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
37:24:00	0.0000	0.0000	0.0000	0.0000	0.000165	0.000165
37:30:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
37:36:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
37:42:00	0.0000	0.0000	0.0000	0.0000	0.000163	0.000163
37:48:00	0.0000	0.0000	0.0000	0.0000	0.000163	0.000163
37:54:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
38:00:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
38:06:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161
38:12:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161
38:18:00	0.0000	0.0000	0.0000	0.0000	0.00016	0.00016
38:24:00	0.0000	0.0000	0.0000	0.0000	0.000159	0.000159
38:30:00	0.0000	0.0000	0.0000	0.0000	0.000159	0.000159
38:36:00	0.0000	0.0000	0.0000	0.0000	0.000158	0.000158
38:42:00	0.0000	0.0000	0.0000	0.0000	0.000158	0.000158
38:48:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
38:54:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
39:00:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
39:06:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
39:12:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
39:18:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
39:24:00	0.0000	0.0000	0.0000	0.0000	0.000154	0.000154

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
39:30:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
39:36:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
39:42:00	0.0000	0.0000	0.0000	0.0000	0.000152	0.000152
39:48:00	0.0000	0.0000	0.0000	0.0000	0.000152	0.000152
39:54:00	0.0000	0.0000	0.0000	0.0000	0.000151	0.000151
40:00:00	0.0000	0.0000	0.0000	0.0000	0.000151	0.000151

Appendix

Catchment descriptors

Name	Value	User-defined value used?
BFIHOST	0.63	No
BFIHOST19	0.64	No
PROPWET (mm)	0.51	No
SAAR (mm)	837	No

UK Design Flood Estimation

Generated on 26 April 2022 13:16:28 by chloenelson
Printed from the ReFH2 Flood Modelling software package, version 3.2.7650.24314

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details Checksum: 0FB2-0A84

Site name: FEH_Point_Descriptors_328669_338322

Easting: 328669

Northing: 338322

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

Model run: 30 year

Summary of results

Rainfall - FEH 2013 model (mm):	43.30	Total runoff (ML):	0.05
Total Rainfall (mm):	28.24	Total flow (ML):	0.18
Peak Rainfall (mm):	3.85	Peak flow (m³/s):	0.01

Parameters

Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.
** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	01:54:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.66	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No

Loss model parameters

Name	Value	User-defined?
Cini (mm)	71.62	No
Cmax (mm)	536.68	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0	No
BL (hr)	28.84	No
BR	2.89	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00:00	0.3194	0.0000	0.0427	0.0000	0.00015	0.00015
00:06:00	0.4311	0.0000	0.0580	0.0000	0.00015	0.000153
00:12:00	0.5811	0.0000	0.0787	0.0000	0.000149	0.000166
00:18:00	0.7819	0.0000	0.1068	0.0000	0.000149	0.000191
00:24:00	1.0499	0.0000	0.1453	0.0001	0.000149	0.000233
00:30:00	1.4060	0.0000	0.1978	0.0001	0.00015	0.000299
00:36:00	1.8760	0.0000	0.2696	0.0002	0.000151	0.000396
00:42:00	2.4884	0.0000	0.3677	0.0004	0.000154	0.000536
00:48:00	3.2595	0.0000	0.4991	0.0006	0.000158	0.000736
00:54:00	3.8501	0.0000	0.6151	0.0009	0.000165	0.00102
01:00:00	3.2595	0.0000	0.5423	0.0012	0.000174	0.0014
01:06:00	2.4884	0.0000	0.4273	0.0017	0.000188	0.00189
01:12:00	1.8760	0.0000	0.3298	0.0022	0.000207	0.00245
01:18:00	1.4060	0.0000	0.2515	0.0028	0.000232	0.00307
01:24:00	1.0499	0.0000	0.1902	0.0035	0.000263	0.00372
01:30:00	0.7819	0.0000	0.1430	0.0041	0.0003	0.00438
01:36:00	0.5811	0.0000	0.1070	0.0047	0.000342	0.00503
01:42:00	0.4311	0.0000	0.0798	0.0053	0.000391	0.00564
01:48:00	0.3194	0.0000	0.0593	0.0057	0.000445	0.00618
01:54:00	0.0000	0.0000	0.0000	0.0061	0.000502	0.00661
02:00:00	0.0000	0.0000	0.0000	0.0063	0.000563	0.0069
02:06:00	0.0000	0.0000	0.0000	0.0064	0.000624	0.00701
02:12:00	0.0000	0.0000	0.0000	0.0063	0.000686	0.007
02:18:00	0.0000	0.0000	0.0000	0.0061	0.000746	0.00687
02:24:00	0.0000	0.0000	0.0000	0.0059	0.000803	0.00667
02:30:00	0.0000	0.0000	0.0000	0.0055	0.000857	0.00641
02:36:00	0.0000	0.0000	0.0000	0.0052	0.000908	0.0061
02:42:00	0.0000	0.0000	0.0000	0.0048	0.000955	0.00577
02:48:00	0.0000	0.0000	0.0000	0.0044	0.000998	0.00543
02:54:00	0.0000	0.0000	0.0000	0.0041	0.00104	0.00509
03:00:00	0.0000	0.0000	0.0000	0.0037	0.00107	0.00477
03:06:00	0.0000	0.0000	0.0000	0.0034	0.0011	0.00448
03:12:00	0.0000	0.0000	0.0000	0.0031	0.00113	0.00422
03:18:00	0.0000	0.0000	0.0000	0.0028	0.00116	0.00397
03:24:00	0.0000	0.0000	0.0000	0.0026	0.00118	0.00374

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
03:30:00	0.0000	0.0000	0.0000	0.0023	0.0012	0.00352
03:36:00	0.0000	0.0000	0.0000	0.0021	0.00122	0.00331
03:42:00	0.0000	0.0000	0.0000	0.0019	0.00123	0.00311
03:48:00	0.0000	0.0000	0.0000	0.0017	0.00125	0.0029
03:54:00	0.0000	0.0000	0.0000	0.0015	0.00126	0.00271
04:00:00	0.0000	0.0000	0.0000	0.0012	0.00127	0.00252
04:06:00	0.0000	0.0000	0.0000	0.0011	0.00128	0.00233
04:12:00	0.0000	0.0000	0.0000	0.0009	0.00128	0.00215
04:18:00	0.0000	0.0000	0.0000	0.0007	0.00128	0.00198
04:24:00	0.0000	0.0000	0.0000	0.0005	0.00129	0.00182
04:30:00	0.0000	0.0000	0.0000	0.0004	0.00129	0.00168
04:36:00	0.0000	0.0000	0.0000	0.0003	0.00128	0.00157
04:42:00	0.0000	0.0000	0.0000	0.0002	0.00128	0.00148
04:48:00	0.0000	0.0000	0.0000	0.0001	0.00128	0.00141
04:54:00	0.0000	0.0000	0.0000	0.0001	0.00128	0.00136
05:00:00	0.0000	0.0000	0.0000	0.0001	0.00127	0.00132
05:06:00	0.0000	0.0000	0.0000	0.0000	0.00127	0.0013
05:12:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00128
05:18:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00127
05:24:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00126
05:30:00	0.0000	0.0000	0.0000	0.0000	0.00125	0.00125
05:36:00	0.0000	0.0000	0.0000	0.0000	0.00125	0.00125
05:42:00	0.0000	0.0000	0.0000	0.0000	0.00124	0.00124
05:48:00	0.0000	0.0000	0.0000	0.0000	0.00124	0.00124
05:54:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
06:00:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
06:06:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
06:12:00	0.0000	0.0000	0.0000	0.0000	0.00122	0.00122
06:18:00	0.0000	0.0000	0.0000	0.0000	0.00122	0.00122
06:24:00	0.0000	0.0000	0.0000	0.0000	0.00121	0.00121
06:30:00	0.0000	0.0000	0.0000	0.0000	0.00121	0.00121
06:36:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
06:42:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
06:48:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
06:54:00	0.0000	0.0000	0.0000	0.0000	0.00119	0.00119
07:00:00	0.0000	0.0000	0.0000	0.0000	0.00119	0.00119

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
07:06:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
07:12:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
07:18:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
07:24:00	0.0000	0.0000	0.0000	0.0000	0.00117	0.00117
07:30:00	0.0000	0.0000	0.0000	0.0000	0.00117	0.00117
07:36:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116
07:42:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116
07:48:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116
07:54:00	0.0000	0.0000	0.0000	0.0000	0.00115	0.00115
08:00:00	0.0000	0.0000	0.0000	0.0000	0.00115	0.00115
08:06:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
08:12:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
08:18:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
08:24:00	0.0000	0.0000	0.0000	0.0000	0.00113	0.00113
08:30:00	0.0000	0.0000	0.0000	0.0000	0.00113	0.00113
08:36:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
08:42:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
08:48:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
08:54:00	0.0000	0.0000	0.0000	0.0000	0.00111	0.00111
09:00:00	0.0000	0.0000	0.0000	0.0000	0.00111	0.00111
09:06:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
09:12:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
09:18:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
09:24:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
09:30:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
09:36:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
09:42:00	0.0000	0.0000	0.0000	0.0000	0.00108	0.00108
09:48:00	0.0000	0.0000	0.0000	0.0000	0.00108	0.00108
09:54:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
10:00:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
10:06:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
10:12:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
10:18:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
10:24:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
10:30:00	0.0000	0.0000	0.0000	0.0000	0.00105	0.00105
10:36:00	0.0000	0.0000	0.0000	0.0000	0.00105	0.00105

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
10:42:00	0.0000	0.0000	0.0000	0.0000	0.00105	0.00105
10:48:00	0.0000	0.0000	0.0000	0.0000	0.00104	0.00104
10:54:00	0.0000	0.0000	0.0000	0.0000	0.00104	0.00104
11:00:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
11:06:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
11:12:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
11:18:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102
11:24:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102
11:30:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102
11:36:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
11:42:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
11:48:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
11:54:00	0.0000	0.0000	0.0000	0.0000	0.001	0.001
12:00:00	0.0000	0.0000	0.0000	0.0000	0.000999	0.000999
12:06:00	0.0000	0.0000	0.0000	0.0000	0.000996	0.000996
12:12:00	0.0000	0.0000	0.0000	0.0000	0.000992	0.000992
12:18:00	0.0000	0.0000	0.0000	0.0000	0.000989	0.000989
12:24:00	0.0000	0.0000	0.0000	0.0000	0.000985	0.000985
12:30:00	0.0000	0.0000	0.0000	0.0000	0.000982	0.000982
12:36:00	0.0000	0.0000	0.0000	0.0000	0.000978	0.000978
12:42:00	0.0000	0.0000	0.0000	0.0000	0.000975	0.000975
12:48:00	0.0000	0.0000	0.0000	0.0000	0.000972	0.000972
12:54:00	0.0000	0.0000	0.0000	0.0000	0.000968	0.000968
13:00:00	0.0000	0.0000	0.0000	0.0000	0.000965	0.000965
13:06:00	0.0000	0.0000	0.0000	0.0000	0.000962	0.000962
13:12:00	0.0000	0.0000	0.0000	0.0000	0.000958	0.000958
13:18:00	0.0000	0.0000	0.0000	0.0000	0.000955	0.000955
13:24:00	0.0000	0.0000	0.0000	0.0000	0.000952	0.000952
13:30:00	0.0000	0.0000	0.0000	0.0000	0.000948	0.000948
13:36:00	0.0000	0.0000	0.0000	0.0000	0.000945	0.000945
13:42:00	0.0000	0.0000	0.0000	0.0000	0.000942	0.000942
13:48:00	0.0000	0.0000	0.0000	0.0000	0.000939	0.000939
13:54:00	0.0000	0.0000	0.0000	0.0000	0.000935	0.000935
14:00:00	0.0000	0.0000	0.0000	0.0000	0.000932	0.000932
14:06:00	0.0000	0.0000	0.0000	0.0000	0.000929	0.000929
14:12:00	0.0000	0.0000	0.0000	0.0000	0.000926	0.000926

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
14:18:00	0.0000	0.0000	0.0000	0.0000	0.000922	0.000922
14:24:00	0.0000	0.0000	0.0000	0.0000	0.000919	0.000919
14:30:00	0.0000	0.0000	0.0000	0.0000	0.000916	0.000916
14:36:00	0.0000	0.0000	0.0000	0.0000	0.000913	0.000913
14:42:00	0.0000	0.0000	0.0000	0.0000	0.00091	0.00091
14:48:00	0.0000	0.0000	0.0000	0.0000	0.000907	0.000907
14:54:00	0.0000	0.0000	0.0000	0.0000	0.000903	0.000903
15:00:00	0.0000	0.0000	0.0000	0.0000	0.0009	0.0009
15:06:00	0.0000	0.0000	0.0000	0.0000	0.000897	0.000897
15:12:00	0.0000	0.0000	0.0000	0.0000	0.000894	0.000894
15:18:00	0.0000	0.0000	0.0000	0.0000	0.000891	0.000891
15:24:00	0.0000	0.0000	0.0000	0.0000	0.000888	0.000888
15:30:00	0.0000	0.0000	0.0000	0.0000	0.000885	0.000885
15:36:00	0.0000	0.0000	0.0000	0.0000	0.000882	0.000882
15:42:00	0.0000	0.0000	0.0000	0.0000	0.000879	0.000879
15:48:00	0.0000	0.0000	0.0000	0.0000	0.000876	0.000876
15:54:00	0.0000	0.0000	0.0000	0.0000	0.000873	0.000873
16:00:00	0.0000	0.0000	0.0000	0.0000	0.00087	0.00087
16:06:00	0.0000	0.0000	0.0000	0.0000	0.000867	0.000867
16:12:00	0.0000	0.0000	0.0000	0.0000	0.000864	0.000864
16:18:00	0.0000	0.0000	0.0000	0.0000	0.000861	0.000861
16:24:00	0.0000	0.0000	0.0000	0.0000	0.000858	0.000858
16:30:00	0.0000	0.0000	0.0000	0.0000	0.000855	0.000855
16:36:00	0.0000	0.0000	0.0000	0.0000	0.000852	0.000852
16:42:00	0.0000	0.0000	0.0000	0.0000	0.000849	0.000849
16:48:00	0.0000	0.0000	0.0000	0.0000	0.000846	0.000846
16:54:00	0.0000	0.0000	0.0000	0.0000	0.000843	0.000843
17:00:00	0.0000	0.0000	0.0000	0.0000	0.00084	0.00084
17:06:00	0.0000	0.0000	0.0000	0.0000	0.000837	0.000837
17:12:00	0.0000	0.0000	0.0000	0.0000	0.000834	0.000834
17:18:00	0.0000	0.0000	0.0000	0.0000	0.000831	0.000831
17:24:00	0.0000	0.0000	0.0000	0.0000	0.000828	0.000828
17:30:00	0.0000	0.0000	0.0000	0.0000	0.000826	0.000826
17:36:00	0.0000	0.0000	0.0000	0.0000	0.000823	0.000823
17:42:00	0.0000	0.0000	0.0000	0.0000	0.00082	0.00082
17:48:00	0.0000	0.0000	0.0000	0.0000	0.000817	0.000817

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:54:00	0.0000	0.0000	0.0000	0.0000	0.000814	0.000814
18:00:00	0.0000	0.0000	0.0000	0.0000	0.000811	0.000811
18:06:00	0.0000	0.0000	0.0000	0.0000	0.000809	0.000809
18:12:00	0.0000	0.0000	0.0000	0.0000	0.000806	0.000806
18:18:00	0.0000	0.0000	0.0000	0.0000	0.000803	0.000803
18:24:00	0.0000	0.0000	0.0000	0.0000	0.0008	0.0008
18:30:00	0.0000	0.0000	0.0000	0.0000	0.000797	0.000797
18:36:00	0.0000	0.0000	0.0000	0.0000	0.000795	0.000795
18:42:00	0.0000	0.0000	0.0000	0.0000	0.000792	0.000792
18:48:00	0.0000	0.0000	0.0000	0.0000	0.000789	0.000789
18:54:00	0.0000	0.0000	0.0000	0.0000	0.000786	0.000786
19:00:00	0.0000	0.0000	0.0000	0.0000	0.000784	0.000784
19:06:00	0.0000	0.0000	0.0000	0.0000	0.000781	0.000781
19:12:00	0.0000	0.0000	0.0000	0.0000	0.000778	0.000778
19:18:00	0.0000	0.0000	0.0000	0.0000	0.000776	0.000776
19:24:00	0.0000	0.0000	0.0000	0.0000	0.000773	0.000773
19:30:00	0.0000	0.0000	0.0000	0.0000	0.00077	0.00077
19:36:00	0.0000	0.0000	0.0000	0.0000	0.000768	0.000768
19:42:00	0.0000	0.0000	0.0000	0.0000	0.000765	0.000765
19:48:00	0.0000	0.0000	0.0000	0.0000	0.000762	0.000762
19:54:00	0.0000	0.0000	0.0000	0.0000	0.00076	0.00076
20:00:00	0.0000	0.0000	0.0000	0.0000	0.000757	0.000757
20:06:00	0.0000	0.0000	0.0000	0.0000	0.000754	0.000754
20:12:00	0.0000	0.0000	0.0000	0.0000	0.000752	0.000752
20:18:00	0.0000	0.0000	0.0000	0.0000	0.000749	0.000749
20:24:00	0.0000	0.0000	0.0000	0.0000	0.000747	0.000747
20:30:00	0.0000	0.0000	0.0000	0.0000	0.000744	0.000744
20:36:00	0.0000	0.0000	0.0000	0.0000	0.000741	0.000741
20:42:00	0.0000	0.0000	0.0000	0.0000	0.000739	0.000739
20:48:00	0.0000	0.0000	0.0000	0.0000	0.000736	0.000736
20:54:00	0.0000	0.0000	0.0000	0.0000	0.000734	0.000734
21:00:00	0.0000	0.0000	0.0000	0.0000	0.000731	0.000731
21:06:00	0.0000	0.0000	0.0000	0.0000	0.000729	0.000729
21:12:00	0.0000	0.0000	0.0000	0.0000	0.000726	0.000726
21:18:00	0.0000	0.0000	0.0000	0.0000	0.000724	0.000724
21:24:00	0.0000	0.0000	0.0000	0.0000	0.000721	0.000721

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
21:30:00	0.0000	0.0000	0.0000	0.0000	0.000719	0.000719
21:36:00	0.0000	0.0000	0.0000	0.0000	0.000716	0.000716
21:42:00	0.0000	0.0000	0.0000	0.0000	0.000714	0.000714
21:48:00	0.0000	0.0000	0.0000	0.0000	0.000711	0.000711
21:54:00	0.0000	0.0000	0.0000	0.0000	0.000709	0.000709
22:00:00	0.0000	0.0000	0.0000	0.0000	0.000706	0.000706
22:06:00	0.0000	0.0000	0.0000	0.0000	0.000704	0.000704
22:12:00	0.0000	0.0000	0.0000	0.0000	0.000701	0.000701
22:18:00	0.0000	0.0000	0.0000	0.0000	0.000699	0.000699
22:24:00	0.0000	0.0000	0.0000	0.0000	0.000697	0.000697
22:30:00	0.0000	0.0000	0.0000	0.0000	0.000694	0.000694
22:36:00	0.0000	0.0000	0.0000	0.0000	0.000692	0.000692
22:42:00	0.0000	0.0000	0.0000	0.0000	0.000689	0.000689
22:48:00	0.0000	0.0000	0.0000	0.0000	0.000687	0.000687
22:54:00	0.0000	0.0000	0.0000	0.0000	0.000685	0.000685
23:00:00	0.0000	0.0000	0.0000	0.0000	0.000682	0.000682
23:06:00	0.0000	0.0000	0.0000	0.0000	0.00068	0.00068
23:12:00	0.0000	0.0000	0.0000	0.0000	0.000677	0.000677
23:18:00	0.0000	0.0000	0.0000	0.0000	0.000675	0.000675
23:24:00	0.0000	0.0000	0.0000	0.0000	0.000673	0.000673
23:30:00	0.0000	0.0000	0.0000	0.0000	0.00067	0.00067
23:36:00	0.0000	0.0000	0.0000	0.0000	0.000668	0.000668
23:42:00	0.0000	0.0000	0.0000	0.0000	0.000666	0.000666
23:48:00	0.0000	0.0000	0.0000	0.0000	0.000664	0.000664
23:54:00	0.0000	0.0000	0.0000	0.0000	0.000661	0.000661
24:00:00	0.0000	0.0000	0.0000	0.0000	0.000659	0.000659
24:06:00	0.0000	0.0000	0.0000	0.0000	0.000657	0.000657
24:12:00	0.0000	0.0000	0.0000	0.0000	0.000654	0.000654
24:18:00	0.0000	0.0000	0.0000	0.0000	0.000652	0.000652
24:24:00	0.0000	0.0000	0.0000	0.0000	0.00065	0.00065
24:30:00	0.0000	0.0000	0.0000	0.0000	0.000648	0.000648
24:36:00	0.0000	0.0000	0.0000	0.0000	0.000645	0.000645
24:42:00	0.0000	0.0000	0.0000	0.0000	0.000643	0.000643
24:48:00	0.0000	0.0000	0.0000	0.0000	0.000641	0.000641
24:54:00	0.0000	0.0000	0.0000	0.0000	0.000639	0.000639
25:00:00	0.0000	0.0000	0.0000	0.0000	0.000637	0.000637

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
25:06:00	0.0000	0.0000	0.0000	0.0000	0.000634	0.000634
25:12:00	0.0000	0.0000	0.0000	0.0000	0.000632	0.000632
25:18:00	0.0000	0.0000	0.0000	0.0000	0.00063	0.00063
25:24:00	0.0000	0.0000	0.0000	0.0000	0.000628	0.000628
25:30:00	0.0000	0.0000	0.0000	0.0000	0.000626	0.000626
25:36:00	0.0000	0.0000	0.0000	0.0000	0.000623	0.000623
25:42:00	0.0000	0.0000	0.0000	0.0000	0.000621	0.000621
25:48:00	0.0000	0.0000	0.0000	0.0000	0.000619	0.000619
25:54:00	0.0000	0.0000	0.0000	0.0000	0.000617	0.000617
26:00:00	0.0000	0.0000	0.0000	0.0000	0.000615	0.000615
26:06:00	0.0000	0.0000	0.0000	0.0000	0.000613	0.000613
26:12:00	0.0000	0.0000	0.0000	0.0000	0.000611	0.000611
26:18:00	0.0000	0.0000	0.0000	0.0000	0.000608	0.000608
26:24:00	0.0000	0.0000	0.0000	0.0000	0.000606	0.000606
26:30:00	0.0000	0.0000	0.0000	0.0000	0.000604	0.000604
26:36:00	0.0000	0.0000	0.0000	0.0000	0.000602	0.000602
26:42:00	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006
26:48:00	0.0000	0.0000	0.0000	0.0000	0.000598	0.000598
26:54:00	0.0000	0.0000	0.0000	0.0000	0.000596	0.000596
27:00:00	0.0000	0.0000	0.0000	0.0000	0.000594	0.000594
27:06:00	0.0000	0.0000	0.0000	0.0000	0.000592	0.000592
27:12:00	0.0000	0.0000	0.0000	0.0000	0.00059	0.00059
27:18:00	0.0000	0.0000	0.0000	0.0000	0.000588	0.000588
27:24:00	0.0000	0.0000	0.0000	0.0000	0.000586	0.000586
27:30:00	0.0000	0.0000	0.0000	0.0000	0.000584	0.000584
27:36:00	0.0000	0.0000	0.0000	0.0000	0.000582	0.000582
27:42:00	0.0000	0.0000	0.0000	0.0000	0.00058	0.00058
27:48:00	0.0000	0.0000	0.0000	0.0000	0.000578	0.000578
27:54:00	0.0000	0.0000	0.0000	0.0000	0.000576	0.000576
28:00:00	0.0000	0.0000	0.0000	0.0000	0.000574	0.000574
28:06:00	0.0000	0.0000	0.0000	0.0000	0.000572	0.000572
28:12:00	0.0000	0.0000	0.0000	0.0000	0.00057	0.00057
28:18:00	0.0000	0.0000	0.0000	0.0000	0.000568	0.000568
28:24:00	0.0000	0.0000	0.0000	0.0000	0.000566	0.000566
28:30:00	0.0000	0.0000	0.0000	0.0000	0.000564	0.000564
28:36:00	0.0000	0.0000	0.0000	0.0000	0.000562	0.000562

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
28:42:00	0.0000	0.0000	0.0000	0.0000	0.00056	0.00056
28:48:00	0.0000	0.0000	0.0000	0.0000	0.000558	0.000558
28:54:00	0.0000	0.0000	0.0000	0.0000	0.000556	0.000556
29:00:00	0.0000	0.0000	0.0000	0.0000	0.000554	0.000554
29:06:00	0.0000	0.0000	0.0000	0.0000	0.000552	0.000552
29:12:00	0.0000	0.0000	0.0000	0.0000	0.00055	0.00055
29:18:00	0.0000	0.0000	0.0000	0.0000	0.000548	0.000548
29:24:00	0.0000	0.0000	0.0000	0.0000	0.000546	0.000546
29:30:00	0.0000	0.0000	0.0000	0.0000	0.000545	0.000545
29:36:00	0.0000	0.0000	0.0000	0.0000	0.000543	0.000543
29:42:00	0.0000	0.0000	0.0000	0.0000	0.000541	0.000541
29:48:00	0.0000	0.0000	0.0000	0.0000	0.000539	0.000539
29:54:00	0.0000	0.0000	0.0000	0.0000	0.000537	0.000537
30:00:00	0.0000	0.0000	0.0000	0.0000	0.000535	0.000535
30:06:00	0.0000	0.0000	0.0000	0.0000	0.000533	0.000533
30:12:00	0.0000	0.0000	0.0000	0.0000	0.000531	0.000531
30:18:00	0.0000	0.0000	0.0000	0.0000	0.00053	0.00053
30:24:00	0.0000	0.0000	0.0000	0.0000	0.000528	0.000528
30:30:00	0.0000	0.0000	0.0000	0.0000	0.000526	0.000526
30:36:00	0.0000	0.0000	0.0000	0.0000	0.000524	0.000524
30:42:00	0.0000	0.0000	0.0000	0.0000	0.000522	0.000522
30:48:00	0.0000	0.0000	0.0000	0.0000	0.000521	0.000521
30:54:00	0.0000	0.0000	0.0000	0.0000	0.000519	0.000519
31:00:00	0.0000	0.0000	0.0000	0.0000	0.000517	0.000517
31:06:00	0.0000	0.0000	0.0000	0.0000	0.000515	0.000515
31:12:00	0.0000	0.0000	0.0000	0.0000	0.000513	0.000513
31:18:00	0.0000	0.0000	0.0000	0.0000	0.000512	0.000512
31:24:00	0.0000	0.0000	0.0000	0.0000	0.00051	0.00051
31:30:00	0.0000	0.0000	0.0000	0.0000	0.000508	0.000508
31:36:00	0.0000	0.0000	0.0000	0.0000	0.000506	0.000506
31:42:00	0.0000	0.0000	0.0000	0.0000	0.000505	0.000505
31:48:00	0.0000	0.0000	0.0000	0.0000	0.000503	0.000503
31:54:00	0.0000	0.0000	0.0000	0.0000	0.000501	0.000501
32:00:00	0.0000	0.0000	0.0000	0.0000	0.000499	0.000499
32:06:00	0.0000	0.0000	0.0000	0.0000	0.000498	0.000498
32:12:00	0.0000	0.0000	0.0000	0.0000	0.000496	0.000496

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
32:18:00	0.0000	0.0000	0.0000	0.0000	0.000494	0.000494
32:24:00	0.0000	0.0000	0.0000	0.0000	0.000492	0.000492
32:30:00	0.0000	0.0000	0.0000	0.0000	0.000491	0.000491
32:36:00	0.0000	0.0000	0.0000	0.0000	0.000489	0.000489
32:42:00	0.0000	0.0000	0.0000	0.0000	0.000487	0.000487
32:48:00	0.0000	0.0000	0.0000	0.0000	0.000486	0.000486
32:54:00	0.0000	0.0000	0.0000	0.0000	0.000484	0.000484
33:00:00	0.0000	0.0000	0.0000	0.0000	0.000482	0.000482
33:06:00	0.0000	0.0000	0.0000	0.0000	0.000481	0.000481
33:12:00	0.0000	0.0000	0.0000	0.0000	0.000479	0.000479
33:18:00	0.0000	0.0000	0.0000	0.0000	0.000477	0.000477
33:24:00	0.0000	0.0000	0.0000	0.0000	0.000476	0.000476
33:30:00	0.0000	0.0000	0.0000	0.0000	0.000474	0.000474
33:36:00	0.0000	0.0000	0.0000	0.0000	0.000472	0.000472
33:42:00	0.0000	0.0000	0.0000	0.0000	0.000471	0.000471
33:48:00	0.0000	0.0000	0.0000	0.0000	0.000469	0.000469
33:54:00	0.0000	0.0000	0.0000	0.0000	0.000468	0.000468
34:00:00	0.0000	0.0000	0.0000	0.0000	0.000466	0.000466
34:06:00	0.0000	0.0000	0.0000	0.0000	0.000464	0.000464
34:12:00	0.0000	0.0000	0.0000	0.0000	0.000463	0.000463
34:18:00	0.0000	0.0000	0.0000	0.0000	0.000461	0.000461
34:24:00	0.0000	0.0000	0.0000	0.0000	0.000459	0.000459
34:30:00	0.0000	0.0000	0.0000	0.0000	0.000458	0.000458
34:36:00	0.0000	0.0000	0.0000	0.0000	0.000456	0.000456
34:42:00	0.0000	0.0000	0.0000	0.0000	0.000455	0.000455
34:48:00	0.0000	0.0000	0.0000	0.0000	0.000453	0.000453
34:54:00	0.0000	0.0000	0.0000	0.0000	0.000452	0.000452
35:00:00	0.0000	0.0000	0.0000	0.0000	0.00045	0.00045
35:06:00	0.0000	0.0000	0.0000	0.0000	0.000448	0.000448
35:12:00	0.0000	0.0000	0.0000	0.0000	0.000447	0.000447
35:18:00	0.0000	0.0000	0.0000	0.0000	0.000445	0.000445
35:24:00	0.0000	0.0000	0.0000	0.0000	0.000444	0.000444
35:30:00	0.0000	0.0000	0.0000	0.0000	0.000442	0.000442
35:36:00	0.0000	0.0000	0.0000	0.0000	0.000441	0.000441
35:42:00	0.0000	0.0000	0.0000	0.0000	0.000439	0.000439
35:48:00	0.0000	0.0000	0.0000	0.0000	0.000438	0.000438

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:54:00	0.0000	0.0000	0.0000	0.0000	0.000436	0.000436
36:00:00	0.0000	0.0000	0.0000	0.0000	0.000435	0.000435
36:06:00	0.0000	0.0000	0.0000	0.0000	0.000433	0.000433
36:12:00	0.0000	0.0000	0.0000	0.0000	0.000432	0.000432
36:18:00	0.0000	0.0000	0.0000	0.0000	0.00043	0.00043
36:24:00	0.0000	0.0000	0.0000	0.0000	0.000429	0.000429
36:30:00	0.0000	0.0000	0.0000	0.0000	0.000427	0.000427
36:36:00	0.0000	0.0000	0.0000	0.0000	0.000426	0.000426
36:42:00	0.0000	0.0000	0.0000	0.0000	0.000424	0.000424
36:48:00	0.0000	0.0000	0.0000	0.0000	0.000423	0.000423
36:54:00	0.0000	0.0000	0.0000	0.0000	0.000421	0.000421
37:00:00	0.0000	0.0000	0.0000	0.0000	0.00042	0.00042
37:06:00	0.0000	0.0000	0.0000	0.0000	0.000418	0.000418
37:12:00	0.0000	0.0000	0.0000	0.0000	0.000417	0.000417
37:18:00	0.0000	0.0000	0.0000	0.0000	0.000416	0.000416
37:24:00	0.0000	0.0000	0.0000	0.0000	0.000414	0.000414
37:30:00	0.0000	0.0000	0.0000	0.0000	0.000413	0.000413
37:36:00	0.0000	0.0000	0.0000	0.0000	0.000411	0.000411
37:42:00	0.0000	0.0000	0.0000	0.0000	0.00041	0.00041
37:48:00	0.0000	0.0000	0.0000	0.0000	0.000408	0.000408
37:54:00	0.0000	0.0000	0.0000	0.0000	0.000407	0.000407
38:00:00	0.0000	0.0000	0.0000	0.0000	0.000406	0.000406
38:06:00	0.0000	0.0000	0.0000	0.0000	0.000404	0.000404
38:12:00	0.0000	0.0000	0.0000	0.0000	0.000403	0.000403
38:18:00	0.0000	0.0000	0.0000	0.0000	0.000401	0.000401
38:24:00	0.0000	0.0000	0.0000	0.0000	0.0004	0.0004
38:30:00	0.0000	0.0000	0.0000	0.0000	0.000399	0.000399
38:36:00	0.0000	0.0000	0.0000	0.0000	0.000397	0.000397
38:42:00	0.0000	0.0000	0.0000	0.0000	0.000396	0.000396
38:48:00	0.0000	0.0000	0.0000	0.0000	0.000394	0.000394
38:54:00	0.0000	0.0000	0.0000	0.0000	0.000393	0.000393
39:00:00	0.0000	0.0000	0.0000	0.0000	0.000392	0.000392
39:06:00	0.0000	0.0000	0.0000	0.0000	0.00039	0.00039
39:12:00	0.0000	0.0000	0.0000	0.0000	0.000389	0.000389
39:18:00	0.0000	0.0000	0.0000	0.0000	0.000388	0.000388
39:24:00	0.0000	0.0000	0.0000	0.0000	0.000386	0.000386

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
39:30:00	0.0000	0.0000	0.0000	0.0000	0.000385	0.000385
39:36:00	0.0000	0.0000	0.0000	0.0000	0.000384	0.000384
39:42:00	0.0000	0.0000	0.0000	0.0000	0.000382	0.000382
39:48:00	0.0000	0.0000	0.0000	0.0000	0.000381	0.000381
39:54:00	0.0000	0.0000	0.0000	0.0000	0.00038	0.00038
40:00:00	0.0000	0.0000	0.0000	0.0000	0.000378	0.000378
40:06:00	0.0000	0.0000	0.0000	0.0000	0.000377	0.000377
40:12:00	0.0000	0.0000	0.0000	0.0000	0.000376	0.000376
40:18:00	0.0000	0.0000	0.0000	0.0000	0.000374	0.000374
40:24:00	0.0000	0.0000	0.0000	0.0000	0.000373	0.000373
40:30:00	0.0000	0.0000	0.0000	0.0000	0.000372	0.000372
40:36:00	0.0000	0.0000	0.0000	0.0000	0.000371	0.000371
40:42:00	0.0000	0.0000	0.0000	0.0000	0.000369	0.000369
40:48:00	0.0000	0.0000	0.0000	0.0000	0.000368	0.000368
40:54:00	0.0000	0.0000	0.0000	0.0000	0.000367	0.000367
41:00:00	0.0000	0.0000	0.0000	0.0000	0.000365	0.000365
41:06:00	0.0000	0.0000	0.0000	0.0000	0.000364	0.000364
41:12:00	0.0000	0.0000	0.0000	0.0000	0.000363	0.000363
41:18:00	0.0000	0.0000	0.0000	0.0000	0.000362	0.000362
41:24:00	0.0000	0.0000	0.0000	0.0000	0.00036	0.00036
41:30:00	0.0000	0.0000	0.0000	0.0000	0.000359	0.000359
41:36:00	0.0000	0.0000	0.0000	0.0000	0.000358	0.000358
41:42:00	0.0000	0.0000	0.0000	0.0000	0.000357	0.000357
41:48:00	0.0000	0.0000	0.0000	0.0000	0.000355	0.000355
41:54:00	0.0000	0.0000	0.0000	0.0000	0.000354	0.000354
42:00:00	0.0000	0.0000	0.0000	0.0000	0.000353	0.000353
42:06:00	0.0000	0.0000	0.0000	0.0000	0.000352	0.000352
42:12:00	0.0000	0.0000	0.0000	0.0000	0.000351	0.000351
42:18:00	0.0000	0.0000	0.0000	0.0000	0.000349	0.000349
42:24:00	0.0000	0.0000	0.0000	0.0000	0.000348	0.000348
42:30:00	0.0000	0.0000	0.0000	0.0000	0.000347	0.000347
42:36:00	0.0000	0.0000	0.0000	0.0000	0.000346	0.000346
42:42:00	0.0000	0.0000	0.0000	0.0000	0.000345	0.000345
42:48:00	0.0000	0.0000	0.0000	0.0000	0.000343	0.000343
42:54:00	0.0000	0.0000	0.0000	0.0000	0.000342	0.000342
43:00:00	0.0000	0.0000	0.0000	0.0000	0.000341	0.000341

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
43:06:00	0.0000	0.0000	0.0000	0.0000	0.00034	0.00034
43:12:00	0.0000	0.0000	0.0000	0.0000	0.000339	0.000339
43:18:00	0.0000	0.0000	0.0000	0.0000	0.000337	0.000337
43:24:00	0.0000	0.0000	0.0000	0.0000	0.000336	0.000336
43:30:00	0.0000	0.0000	0.0000	0.0000	0.000335	0.000335
43:36:00	0.0000	0.0000	0.0000	0.0000	0.000334	0.000334
43:42:00	0.0000	0.0000	0.0000	0.0000	0.000333	0.000333
43:48:00	0.0000	0.0000	0.0000	0.0000	0.000332	0.000332
43:54:00	0.0000	0.0000	0.0000	0.0000	0.000331	0.000331
44:00:00	0.0000	0.0000	0.0000	0.0000	0.000329	0.000329
44:06:00	0.0000	0.0000	0.0000	0.0000	0.000328	0.000328
44:12:00	0.0000	0.0000	0.0000	0.0000	0.000327	0.000327
44:18:00	0.0000	0.0000	0.0000	0.0000	0.000326	0.000326
44:24:00	0.0000	0.0000	0.0000	0.0000	0.000325	0.000325
44:30:00	0.0000	0.0000	0.0000	0.0000	0.000324	0.000324
44:36:00	0.0000	0.0000	0.0000	0.0000	0.000323	0.000323
44:42:00	0.0000	0.0000	0.0000	0.0000	0.000321	0.000321
44:48:00	0.0000	0.0000	0.0000	0.0000	0.00032	0.00032
44:54:00	0.0000	0.0000	0.0000	0.0000	0.000319	0.000319
45:00:00	0.0000	0.0000	0.0000	0.0000	0.000318	0.000318
45:06:00	0.0000	0.0000	0.0000	0.0000	0.000317	0.000317
45:12:00	0.0000	0.0000	0.0000	0.0000	0.000316	0.000316
45:18:00	0.0000	0.0000	0.0000	0.0000	0.000315	0.000315
45:24:00	0.0000	0.0000	0.0000	0.0000	0.000314	0.000314
45:30:00	0.0000	0.0000	0.0000	0.0000	0.000313	0.000313
45:36:00	0.0000	0.0000	0.0000	0.0000	0.000312	0.000312
45:42:00	0.0000	0.0000	0.0000	0.0000	0.000311	0.000311
45:48:00	0.0000	0.0000	0.0000	0.0000	0.000309	0.000309
45:54:00	0.0000	0.0000	0.0000	0.0000	0.000308	0.000308
46:00:00	0.0000	0.0000	0.0000	0.0000	0.000307	0.000307
46:06:00	0.0000	0.0000	0.0000	0.0000	0.000306	0.000306
46:12:00	0.0000	0.0000	0.0000	0.0000	0.000305	0.000305
46:18:00	0.0000	0.0000	0.0000	0.0000	0.000304	0.000304
46:24:00	0.0000	0.0000	0.0000	0.0000	0.000303	0.000303
46:30:00	0.0000	0.0000	0.0000	0.0000	0.000302	0.000302
46:36:00	0.0000	0.0000	0.0000	0.0000	0.000301	0.000301

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
46:42:00	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
46:48:00	0.0000	0.0000	0.0000	0.0000	0.000299	0.000299
46:54:00	0.0000	0.0000	0.0000	0.0000	0.000298	0.000298
47:00:00	0.0000	0.0000	0.0000	0.0000	0.000297	0.000297
47:06:00	0.0000	0.0000	0.0000	0.0000	0.000296	0.000296
47:12:00	0.0000	0.0000	0.0000	0.0000	0.000295	0.000295
47:18:00	0.0000	0.0000	0.0000	0.0000	0.000294	0.000294
47:24:00	0.0000	0.0000	0.0000	0.0000	0.000293	0.000293
47:30:00	0.0000	0.0000	0.0000	0.0000	0.000292	0.000292
47:36:00	0.0000	0.0000	0.0000	0.0000	0.000291	0.000291
47:42:00	0.0000	0.0000	0.0000	0.0000	0.00029	0.00029
47:48:00	0.0000	0.0000	0.0000	0.0000	0.000289	0.000289
47:54:00	0.0000	0.0000	0.0000	0.0000	0.000288	0.000288
48:00:00	0.0000	0.0000	0.0000	0.0000	0.000287	0.000287
48:06:00	0.0000	0.0000	0.0000	0.0000	0.000286	0.000286
48:12:00	0.0000	0.0000	0.0000	0.0000	0.000285	0.000285
48:18:00	0.0000	0.0000	0.0000	0.0000	0.000284	0.000284
48:24:00	0.0000	0.0000	0.0000	0.0000	0.000283	0.000283
48:30:00	0.0000	0.0000	0.0000	0.0000	0.000282	0.000282
48:36:00	0.0000	0.0000	0.0000	0.0000	0.000281	0.000281
48:42:00	0.0000	0.0000	0.0000	0.0000	0.00028	0.00028
48:48:00	0.0000	0.0000	0.0000	0.0000	0.000279	0.000279
48:54:00	0.0000	0.0000	0.0000	0.0000	0.000278	0.000278
49:00:00	0.0000	0.0000	0.0000	0.0000	0.000277	0.000277
49:06:00	0.0000	0.0000	0.0000	0.0000	0.000276	0.000276
49:12:00	0.0000	0.0000	0.0000	0.0000	0.000275	0.000275
49:18:00	0.0000	0.0000	0.0000	0.0000	0.000274	0.000274
49:24:00	0.0000	0.0000	0.0000	0.0000	0.000273	0.000273
49:30:00	0.0000	0.0000	0.0000	0.0000	0.000272	0.000272
49:36:00	0.0000	0.0000	0.0000	0.0000	0.000271	0.000271
49:42:00	0.0000	0.0000	0.0000	0.0000	0.00027	0.00027
49:48:00	0.0000	0.0000	0.0000	0.0000	0.000269	0.000269
49:54:00	0.0000	0.0000	0.0000	0.0000	0.000268	0.000268
50:00:00	0.0000	0.0000	0.0000	0.0000	0.000268	0.000268
50:06:00	0.0000	0.0000	0.0000	0.0000	0.000267	0.000267
50:12:00	0.0000	0.0000	0.0000	0.0000	0.000266	0.000266

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
50:18:00	0.0000	0.0000	0.0000	0.0000	0.000265	0.000265
50:24:00	0.0000	0.0000	0.0000	0.0000	0.000264	0.000264
50:30:00	0.0000	0.0000	0.0000	0.0000	0.000263	0.000263
50:36:00	0.0000	0.0000	0.0000	0.0000	0.000262	0.000262
50:42:00	0.0000	0.0000	0.0000	0.0000	0.000261	0.000261
50:48:00	0.0000	0.0000	0.0000	0.0000	0.00026	0.00026
50:54:00	0.0000	0.0000	0.0000	0.0000	0.000259	0.000259
51:00:00	0.0000	0.0000	0.0000	0.0000	0.000258	0.000258
51:06:00	0.0000	0.0000	0.0000	0.0000	0.000258	0.000258
51:12:00	0.0000	0.0000	0.0000	0.0000	0.000257	0.000257
51:18:00	0.0000	0.0000	0.0000	0.0000	0.000256	0.000256
51:24:00	0.0000	0.0000	0.0000	0.0000	0.000255	0.000255
51:30:00	0.0000	0.0000	0.0000	0.0000	0.000254	0.000254
51:36:00	0.0000	0.0000	0.0000	0.0000	0.000253	0.000253
51:42:00	0.0000	0.0000	0.0000	0.0000	0.000252	0.000252
51:48:00	0.0000	0.0000	0.0000	0.0000	0.000251	0.000251
51:54:00	0.0000	0.0000	0.0000	0.0000	0.00025	0.00025
52:00:00	0.0000	0.0000	0.0000	0.0000	0.00025	0.00025
52:06:00	0.0000	0.0000	0.0000	0.0000	0.000249	0.000249
52:12:00	0.0000	0.0000	0.0000	0.0000	0.000248	0.000248
52:18:00	0.0000	0.0000	0.0000	0.0000	0.000247	0.000247
52:24:00	0.0000	0.0000	0.0000	0.0000	0.000246	0.000246
52:30:00	0.0000	0.0000	0.0000	0.0000	0.000245	0.000245
52:36:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
52:42:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
52:48:00	0.0000	0.0000	0.0000	0.0000	0.000243	0.000243
52:54:00	0.0000	0.0000	0.0000	0.0000	0.000242	0.000242
53:00:00	0.0000	0.0000	0.0000	0.0000	0.000241	0.000241
53:06:00	0.0000	0.0000	0.0000	0.0000	0.00024	0.00024
53:12:00	0.0000	0.0000	0.0000	0.0000	0.000239	0.000239
53:18:00	0.0000	0.0000	0.0000	0.0000	0.000239	0.000239
53:24:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
53:30:00	0.0000	0.0000	0.0000	0.0000	0.000237	0.000237
53:36:00	0.0000	0.0000	0.0000	0.0000	0.000236	0.000236
53:42:00	0.0000	0.0000	0.0000	0.0000	0.000235	0.000235
53:48:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
53:54:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234
54:00:00	0.0000	0.0000	0.0000	0.0000	0.000233	0.000233
54:06:00	0.0000	0.0000	0.0000	0.0000	0.000232	0.000232
54:12:00	0.0000	0.0000	0.0000	0.0000	0.000231	0.000231
54:18:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
54:24:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
54:30:00	0.0000	0.0000	0.0000	0.0000	0.000229	0.000229
54:36:00	0.0000	0.0000	0.0000	0.0000	0.000228	0.000228
54:42:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
54:48:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
54:54:00	0.0000	0.0000	0.0000	0.0000	0.000226	0.000226
55:00:00	0.0000	0.0000	0.0000	0.0000	0.000225	0.000225
55:06:00	0.0000	0.0000	0.0000	0.0000	0.000224	0.000224
55:12:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
55:18:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
55:24:00	0.0000	0.0000	0.0000	0.0000	0.000222	0.000222
55:30:00	0.0000	0.0000	0.0000	0.0000	0.000221	0.000221
55:36:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
55:42:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
55:48:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
55:54:00	0.0000	0.0000	0.0000	0.0000	0.000218	0.000218
56:00:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
56:06:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
56:12:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
56:18:00	0.0000	0.0000	0.0000	0.0000	0.000215	0.000215
56:24:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
56:30:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
56:36:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
56:42:00	0.0000	0.0000	0.0000	0.0000	0.000212	0.000212
56:48:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
56:54:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
57:00:00	0.0000	0.0000	0.0000	0.0000	0.00021	0.00021
57:06:00	0.0000	0.0000	0.0000	0.0000	0.000209	0.000209
57:12:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
57:18:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
57:24:00	0.0000	0.0000	0.0000	0.0000	0.000207	0.000207

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
57:30:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
57:36:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
57:42:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
57:48:00	0.0000	0.0000	0.0000	0.0000	0.000204	0.000204
57:54:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
58:00:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
58:06:00	0.0000	0.0000	0.0000	0.0000	0.000202	0.000202
58:12:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
58:18:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
58:24:00	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
58:30:00	0.0000	0.0000	0.0000	0.0000	0.000199	0.000199
58:36:00	0.0000	0.0000	0.0000	0.0000	0.000199	0.000199
58:42:00	0.0000	0.0000	0.0000	0.0000	0.000198	0.000198
58:48:00	0.0000	0.0000	0.0000	0.0000	0.000197	0.000197
58:54:00	0.0000	0.0000	0.0000	0.0000	0.000196	0.000196
59:00:00	0.0000	0.0000	0.0000	0.0000	0.000196	0.000196
59:06:00	0.0000	0.0000	0.0000	0.0000	0.000195	0.000195
59:12:00	0.0000	0.0000	0.0000	0.0000	0.000194	0.000194
59:18:00	0.0000	0.0000	0.0000	0.0000	0.000194	0.000194
59:24:00	0.0000	0.0000	0.0000	0.0000	0.000193	0.000193
59:30:00	0.0000	0.0000	0.0000	0.0000	0.000192	0.000192
59:36:00	0.0000	0.0000	0.0000	0.0000	0.000192	0.000192
59:42:00	0.0000	0.0000	0.0000	0.0000	0.000191	0.000191
59:48:00	0.0000	0.0000	0.0000	0.0000	0.00019	0.00019
59:54:00	0.0000	0.0000	0.0000	0.0000	0.00019	0.00019
60:00:00	0.0000	0.0000	0.0000	0.0000	0.000189	0.000189
60:06:00	0.0000	0.0000	0.0000	0.0000	0.000188	0.000188
60:12:00	0.0000	0.0000	0.0000	0.0000	0.000188	0.000188
60:18:00	0.0000	0.0000	0.0000	0.0000	0.000187	0.000187
60:24:00	0.0000	0.0000	0.0000	0.0000	0.000187	0.000187
60:30:00	0.0000	0.0000	0.0000	0.0000	0.000186	0.000186
60:36:00	0.0000	0.0000	0.0000	0.0000	0.000185	0.000185
60:42:00	0.0000	0.0000	0.0000	0.0000	0.000185	0.000185
60:48:00	0.0000	0.0000	0.0000	0.0000	0.000184	0.000184
60:54:00	0.0000	0.0000	0.0000	0.0000	0.000183	0.000183
61:00:00	0.0000	0.0000	0.0000	0.0000	0.000183	0.000183

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
61:06:00	0.0000	0.0000	0.0000	0.0000	0.000182	0.000182
61:12:00	0.0000	0.0000	0.0000	0.0000	0.000181	0.000181
61:18:00	0.0000	0.0000	0.0000	0.0000	0.000181	0.000181
61:24:00	0.0000	0.0000	0.0000	0.0000	0.00018	0.00018
61:30:00	0.0000	0.0000	0.0000	0.0000	0.00018	0.00018
61:36:00	0.0000	0.0000	0.0000	0.0000	0.000179	0.000179
61:42:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
61:48:00	0.0000	0.0000	0.0000	0.0000	0.000178	0.000178
61:54:00	0.0000	0.0000	0.0000	0.0000	0.000177	0.000177
62:00:00	0.0000	0.0000	0.0000	0.0000	0.000176	0.000176
62:06:00	0.0000	0.0000	0.0000	0.0000	0.000176	0.000176
62:12:00	0.0000	0.0000	0.0000	0.0000	0.000175	0.000175
62:18:00	0.0000	0.0000	0.0000	0.0000	0.000175	0.000175
62:24:00	0.0000	0.0000	0.0000	0.0000	0.000174	0.000174
62:30:00	0.0000	0.0000	0.0000	0.0000	0.000173	0.000173
62:36:00	0.0000	0.0000	0.0000	0.0000	0.000173	0.000173
62:42:00	0.0000	0.0000	0.0000	0.0000	0.000172	0.000172
62:48:00	0.0000	0.0000	0.0000	0.0000	0.000172	0.000172
62:54:00	0.0000	0.0000	0.0000	0.0000	0.000171	0.000171
63:00:00	0.0000	0.0000	0.0000	0.0000	0.00017	0.00017
63:06:00	0.0000	0.0000	0.0000	0.0000	0.00017	0.00017
63:12:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
63:18:00	0.0000	0.0000	0.0000	0.0000	0.000169	0.000169
63:24:00	0.0000	0.0000	0.0000	0.0000	0.000168	0.000168
63:30:00	0.0000	0.0000	0.0000	0.0000	0.000168	0.000168
63:36:00	0.0000	0.0000	0.0000	0.0000	0.000167	0.000167
63:42:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
63:48:00	0.0000	0.0000	0.0000	0.0000	0.000166	0.000166
63:54:00	0.0000	0.0000	0.0000	0.0000	0.000165	0.000165
64:00:00	0.0000	0.0000	0.0000	0.0000	0.000165	0.000165
64:06:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
64:12:00	0.0000	0.0000	0.0000	0.0000	0.000164	0.000164
64:18:00	0.0000	0.0000	0.0000	0.0000	0.000163	0.000163
64:24:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
64:30:00	0.0000	0.0000	0.0000	0.0000	0.000162	0.000162
64:36:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
64:42:00	0.0000	0.0000	0.0000	0.0000	0.000161	0.000161
64:48:00	0.0000	0.0000	0.0000	0.0000	0.00016	0.00016
64:54:00	0.0000	0.0000	0.0000	0.0000	0.00016	0.00016
65:00:00	0.0000	0.0000	0.0000	0.0000	0.000159	0.000159
65:06:00	0.0000	0.0000	0.0000	0.0000	0.000158	0.000158
65:12:00	0.0000	0.0000	0.0000	0.0000	0.000158	0.000158
65:18:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
65:24:00	0.0000	0.0000	0.0000	0.0000	0.000157	0.000157
65:30:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
65:36:00	0.0000	0.0000	0.0000	0.0000	0.000156	0.000156
65:42:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
65:48:00	0.0000	0.0000	0.0000	0.0000	0.000155	0.000155
65:54:00	0.0000	0.0000	0.0000	0.0000	0.000154	0.000154
66:00:00	0.0000	0.0000	0.0000	0.0000	0.000154	0.000154
66:06:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
66:12:00	0.0000	0.0000	0.0000	0.0000	0.000153	0.000153
66:18:00	0.0000	0.0000	0.0000	0.0000	0.000152	0.000152
66:24:00	0.0000	0.0000	0.0000	0.0000	0.000151	0.000151
66:30:00	0.0000	0.0000	0.0000	0.0000	0.000151	0.000151

Appendix

Catchment descriptors

Name	Value	User-defined value used?
BFIHOST	0.63	No
BFIHOST19	0.64	No
PROPWET (mm)	0.51	No
SAAR (mm)	837	No

UK Design Flood Estimation

Generated on 26 April 2022 13:16:47 by chloenelson
Printed from the ReFH2 Flood Modelling software package, version 3.2.7650.24314

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details Checksum: 0FB2-0A84

Site name: FEH_Point_Descriptors_328669_338322

Easting: 328669

Northing: 338322

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

Model run: 100 year

Summary of results

Rainfall - FEH 2013 model (mm):	59.68	Total runoff (ML):	0.07
Total Rainfall (mm):	38.92	Total flow (ML):	0.25
Peak Rainfall (mm):	5.31	Peak flow (m³/s):	0.01

Parameters

Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.
** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	01:54:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.66	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No

Loss model parameters

Name	Value	User-defined?
Cini (mm)	71.62	No
Cmax (mm)	536.68	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0	No
BL (hr)	28.84	No
BR	2.89	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00:00	0.4403	0.0000	0.0589	0.0000	0.00015	0.00015
00:06:00	0.5943	0.0000	0.0801	0.0000	0.00015	0.000155
00:12:00	0.8010	0.0000	0.1090	0.0000	0.000149	0.000172
00:18:00	1.0778	0.0000	0.1486	0.0001	0.000149	0.000207
00:24:00	1.4472	0.0000	0.2029	0.0001	0.000149	0.000266
00:30:00	1.9381	0.0000	0.2779	0.0002	0.00015	0.000357
00:36:00	2.5859	0.0000	0.3816	0.0003	0.000153	0.000492
00:42:00	3.4301	0.0000	0.5255	0.0005	0.000157	0.000689
00:48:00	4.4930	0.0000	0.7215	0.0008	0.000163	0.00097
00:54:00	5.3071	0.0000	0.9007	0.0012	0.000172	0.00137
01:00:00	4.4930	0.0000	0.8035	0.0017	0.000186	0.00191
01:06:00	3.4301	0.0000	0.6387	0.0024	0.000206	0.00261
01:12:00	2.5859	0.0000	0.4960	0.0032	0.000233	0.00343
01:18:00	1.9381	0.0000	0.3799	0.0041	0.000269	0.00433
01:24:00	1.4472	0.0000	0.2883	0.0050	0.000313	0.00528
01:30:00	1.0778	0.0000	0.2172	0.0059	0.000366	0.00625
01:36:00	0.8010	0.0000	0.1628	0.0068	0.000428	0.00721
01:42:00	0.5943	0.0000	0.1216	0.0076	0.000499	0.00811
01:48:00	0.4403	0.0000	0.0905	0.0083	0.000577	0.00892
01:54:00	0.0000	0.0000	0.0000	0.0089	0.000661	0.00958
02:00:00	0.0000	0.0000	0.0000	0.0093	0.00075	0.01
02:06:00	0.0000	0.0000	0.0000	0.0094	0.00084	0.0102
02:12:00	0.0000	0.0000	0.0000	0.0093	0.00093	0.0102
02:18:00	0.0000	0.0000	0.0000	0.0090	0.00102	0.01
02:24:00	0.0000	0.0000	0.0000	0.0086	0.0011	0.00974
02:30:00	0.0000	0.0000	0.0000	0.0082	0.00118	0.00937
02:36:00	0.0000	0.0000	0.0000	0.0077	0.00126	0.00892
02:42:00	0.0000	0.0000	0.0000	0.0071	0.00133	0.00844
02:48:00	0.0000	0.0000	0.0000	0.0065	0.00139	0.00794
02:54:00	0.0000	0.0000	0.0000	0.0060	0.00145	0.00744
03:00:00	0.0000	0.0000	0.0000	0.0055	0.0015	0.00697
03:06:00	0.0000	0.0000	0.0000	0.0050	0.00155	0.00654
03:12:00	0.0000	0.0000	0.0000	0.0046	0.00159	0.00615
03:18:00	0.0000	0.0000	0.0000	0.0042	0.00163	0.00579
03:24:00	0.0000	0.0000	0.0000	0.0038	0.00166	0.00545

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
03:30:00	0.0000	0.0000	0.0000	0.0034	0.00169	0.00513
03:36:00	0.0000	0.0000	0.0000	0.0031	0.00172	0.00482
03:42:00	0.0000	0.0000	0.0000	0.0028	0.00174	0.00452
03:48:00	0.0000	0.0000	0.0000	0.0025	0.00176	0.00422
03:54:00	0.0000	0.0000	0.0000	0.0022	0.00178	0.00394
04:00:00	0.0000	0.0000	0.0000	0.0019	0.0018	0.00365
04:06:00	0.0000	0.0000	0.0000	0.0016	0.00181	0.00338
04:12:00	0.0000	0.0000	0.0000	0.0013	0.00181	0.00311
04:18:00	0.0000	0.0000	0.0000	0.0010	0.00182	0.00286
04:24:00	0.0000	0.0000	0.0000	0.0008	0.00182	0.00262
04:30:00	0.0000	0.0000	0.0000	0.0006	0.00182	0.00242
04:36:00	0.0000	0.0000	0.0000	0.0004	0.00182	0.00225
04:42:00	0.0000	0.0000	0.0000	0.0003	0.00182	0.00211
04:48:00	0.0000	0.0000	0.0000	0.0002	0.00182	0.00201
04:54:00	0.0000	0.0000	0.0000	0.0001	0.00181	0.00194
05:00:00	0.0000	0.0000	0.0000	0.0001	0.00181	0.00188
05:06:00	0.0000	0.0000	0.0000	0.0000	0.0018	0.00184
05:12:00	0.0000	0.0000	0.0000	0.0000	0.00179	0.00182
05:18:00	0.0000	0.0000	0.0000	0.0000	0.00179	0.0018
05:24:00	0.0000	0.0000	0.0000	0.0000	0.00178	0.00178
05:30:00	0.0000	0.0000	0.0000	0.0000	0.00178	0.00178
05:36:00	0.0000	0.0000	0.0000	0.0000	0.00177	0.00177
05:42:00	0.0000	0.0000	0.0000	0.0000	0.00176	0.00176
05:48:00	0.0000	0.0000	0.0000	0.0000	0.00176	0.00176
05:54:00	0.0000	0.0000	0.0000	0.0000	0.00175	0.00175
06:00:00	0.0000	0.0000	0.0000	0.0000	0.00175	0.00175
06:06:00	0.0000	0.0000	0.0000	0.0000	0.00174	0.00174
06:12:00	0.0000	0.0000	0.0000	0.0000	0.00173	0.00173
06:18:00	0.0000	0.0000	0.0000	0.0000	0.00173	0.00173
06:24:00	0.0000	0.0000	0.0000	0.0000	0.00172	0.00172
06:30:00	0.0000	0.0000	0.0000	0.0000	0.00172	0.00172
06:36:00	0.0000	0.0000	0.0000	0.0000	0.00171	0.00171
06:42:00	0.0000	0.0000	0.0000	0.0000	0.0017	0.0017
06:48:00	0.0000	0.0000	0.0000	0.0000	0.0017	0.0017
06:54:00	0.0000	0.0000	0.0000	0.0000	0.00169	0.00169
07:00:00	0.0000	0.0000	0.0000	0.0000	0.00169	0.00169

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
07:06:00	0.0000	0.0000	0.0000	0.0000	0.00168	0.00168
07:12:00	0.0000	0.0000	0.0000	0.0000	0.00167	0.00167
07:18:00	0.0000	0.0000	0.0000	0.0000	0.00167	0.00167
07:24:00	0.0000	0.0000	0.0000	0.0000	0.00166	0.00166
07:30:00	0.0000	0.0000	0.0000	0.0000	0.00166	0.00166
07:36:00	0.0000	0.0000	0.0000	0.0000	0.00165	0.00165
07:42:00	0.0000	0.0000	0.0000	0.0000	0.00165	0.00165
07:48:00	0.0000	0.0000	0.0000	0.0000	0.00164	0.00164
07:54:00	0.0000	0.0000	0.0000	0.0000	0.00163	0.00163
08:00:00	0.0000	0.0000	0.0000	0.0000	0.00163	0.00163
08:06:00	0.0000	0.0000	0.0000	0.0000	0.00162	0.00162
08:12:00	0.0000	0.0000	0.0000	0.0000	0.00162	0.00162
08:18:00	0.0000	0.0000	0.0000	0.0000	0.00161	0.00161
08:24:00	0.0000	0.0000	0.0000	0.0000	0.00161	0.00161
08:30:00	0.0000	0.0000	0.0000	0.0000	0.0016	0.0016
08:36:00	0.0000	0.0000	0.0000	0.0000	0.00159	0.00159
08:42:00	0.0000	0.0000	0.0000	0.0000	0.00159	0.00159
08:48:00	0.0000	0.0000	0.0000	0.0000	0.00158	0.00158
08:54:00	0.0000	0.0000	0.0000	0.0000	0.00158	0.00158
09:00:00	0.0000	0.0000	0.0000	0.0000	0.00157	0.00157
09:06:00	0.0000	0.0000	0.0000	0.0000	0.00157	0.00157
09:12:00	0.0000	0.0000	0.0000	0.0000	0.00156	0.00156
09:18:00	0.0000	0.0000	0.0000	0.0000	0.00156	0.00156
09:24:00	0.0000	0.0000	0.0000	0.0000	0.00155	0.00155
09:30:00	0.0000	0.0000	0.0000	0.0000	0.00155	0.00155
09:36:00	0.0000	0.0000	0.0000	0.0000	0.00154	0.00154
09:42:00	0.0000	0.0000	0.0000	0.0000	0.00153	0.00153
09:48:00	0.0000	0.0000	0.0000	0.0000	0.00153	0.00153
09:54:00	0.0000	0.0000	0.0000	0.0000	0.00152	0.00152
10:00:00	0.0000	0.0000	0.0000	0.0000	0.00152	0.00152
10:06:00	0.0000	0.0000	0.0000	0.0000	0.00151	0.00151
10:12:00	0.0000	0.0000	0.0000	0.0000	0.00151	0.00151
10:18:00	0.0000	0.0000	0.0000	0.0000	0.0015	0.0015
10:24:00	0.0000	0.0000	0.0000	0.0000	0.0015	0.0015
10:30:00	0.0000	0.0000	0.0000	0.0000	0.00149	0.00149
10:36:00	0.0000	0.0000	0.0000	0.0000	0.00149	0.00149

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
10:42:00	0.0000	0.0000	0.0000	0.0000	0.00148	0.00148
10:48:00	0.0000	0.0000	0.0000	0.0000	0.00148	0.00148
10:54:00	0.0000	0.0000	0.0000	0.0000	0.00147	0.00147
11:00:00	0.0000	0.0000	0.0000	0.0000	0.00147	0.00147
11:06:00	0.0000	0.0000	0.0000	0.0000	0.00146	0.00146
11:12:00	0.0000	0.0000	0.0000	0.0000	0.00146	0.00146
11:18:00	0.0000	0.0000	0.0000	0.0000	0.00145	0.00145
11:24:00	0.0000	0.0000	0.0000	0.0000	0.00145	0.00145
11:30:00	0.0000	0.0000	0.0000	0.0000	0.00144	0.00144
11:36:00	0.0000	0.0000	0.0000	0.0000	0.00144	0.00144
11:42:00	0.0000	0.0000	0.0000	0.0000	0.00143	0.00143
11:48:00	0.0000	0.0000	0.0000	0.0000	0.00143	0.00143
11:54:00	0.0000	0.0000	0.0000	0.0000	0.00142	0.00142
12:00:00	0.0000	0.0000	0.0000	0.0000	0.00142	0.00142
12:06:00	0.0000	0.0000	0.0000	0.0000	0.00141	0.00141
12:12:00	0.0000	0.0000	0.0000	0.0000	0.00141	0.00141
12:18:00	0.0000	0.0000	0.0000	0.0000	0.0014	0.0014
12:24:00	0.0000	0.0000	0.0000	0.0000	0.0014	0.0014
12:30:00	0.0000	0.0000	0.0000	0.0000	0.00139	0.00139
12:36:00	0.0000	0.0000	0.0000	0.0000	0.00139	0.00139
12:42:00	0.0000	0.0000	0.0000	0.0000	0.00138	0.00138
12:48:00	0.0000	0.0000	0.0000	0.0000	0.00138	0.00138
12:54:00	0.0000	0.0000	0.0000	0.0000	0.00137	0.00137
13:00:00	0.0000	0.0000	0.0000	0.0000	0.00137	0.00137
13:06:00	0.0000	0.0000	0.0000	0.0000	0.00136	0.00136
13:12:00	0.0000	0.0000	0.0000	0.0000	0.00136	0.00136
13:18:00	0.0000	0.0000	0.0000	0.0000	0.00135	0.00135
13:24:00	0.0000	0.0000	0.0000	0.0000	0.00135	0.00135
13:30:00	0.0000	0.0000	0.0000	0.0000	0.00135	0.00135
13:36:00	0.0000	0.0000	0.0000	0.0000	0.00134	0.00134
13:42:00	0.0000	0.0000	0.0000	0.0000	0.00134	0.00134
13:48:00	0.0000	0.0000	0.0000	0.0000	0.00133	0.00133
13:54:00	0.0000	0.0000	0.0000	0.0000	0.00133	0.00133
14:00:00	0.0000	0.0000	0.0000	0.0000	0.00132	0.00132
14:06:00	0.0000	0.0000	0.0000	0.0000	0.00132	0.00132
14:12:00	0.0000	0.0000	0.0000	0.0000	0.00131	0.00131

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
14:18:00	0.0000	0.0000	0.0000	0.0000	0.00131	0.00131
14:24:00	0.0000	0.0000	0.0000	0.0000	0.0013	0.0013
14:30:00	0.0000	0.0000	0.0000	0.0000	0.0013	0.0013
14:36:00	0.0000	0.0000	0.0000	0.0000	0.0013	0.0013
14:42:00	0.0000	0.0000	0.0000	0.0000	0.00129	0.00129
14:48:00	0.0000	0.0000	0.0000	0.0000	0.00129	0.00129
14:54:00	0.0000	0.0000	0.0000	0.0000	0.00128	0.00128
15:00:00	0.0000	0.0000	0.0000	0.0000	0.00128	0.00128
15:06:00	0.0000	0.0000	0.0000	0.0000	0.00127	0.00127
15:12:00	0.0000	0.0000	0.0000	0.0000	0.00127	0.00127
15:18:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00126
15:24:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00126
15:30:00	0.0000	0.0000	0.0000	0.0000	0.00126	0.00126
15:36:00	0.0000	0.0000	0.0000	0.0000	0.00125	0.00125
15:42:00	0.0000	0.0000	0.0000	0.0000	0.00125	0.00125
15:48:00	0.0000	0.0000	0.0000	0.0000	0.00124	0.00124
15:54:00	0.0000	0.0000	0.0000	0.0000	0.00124	0.00124
16:00:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
16:06:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
16:12:00	0.0000	0.0000	0.0000	0.0000	0.00123	0.00123
16:18:00	0.0000	0.0000	0.0000	0.0000	0.00122	0.00122
16:24:00	0.0000	0.0000	0.0000	0.0000	0.00122	0.00122
16:30:00	0.0000	0.0000	0.0000	0.0000	0.00121	0.00121
16:36:00	0.0000	0.0000	0.0000	0.0000	0.00121	0.00121
16:42:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
16:48:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
16:54:00	0.0000	0.0000	0.0000	0.0000	0.0012	0.0012
17:00:00	0.0000	0.0000	0.0000	0.0000	0.00119	0.00119
17:06:00	0.0000	0.0000	0.0000	0.0000	0.00119	0.00119
17:12:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
17:18:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
17:24:00	0.0000	0.0000	0.0000	0.0000	0.00118	0.00118
17:30:00	0.0000	0.0000	0.0000	0.0000	0.00117	0.00117
17:36:00	0.0000	0.0000	0.0000	0.0000	0.00117	0.00117
17:42:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116
17:48:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:54:00	0.0000	0.0000	0.0000	0.0000	0.00116	0.00116
18:00:00	0.0000	0.0000	0.0000	0.0000	0.00115	0.00115
18:06:00	0.0000	0.0000	0.0000	0.0000	0.00115	0.00115
18:12:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
18:18:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
18:24:00	0.0000	0.0000	0.0000	0.0000	0.00114	0.00114
18:30:00	0.0000	0.0000	0.0000	0.0000	0.00113	0.00113
18:36:00	0.0000	0.0000	0.0000	0.0000	0.00113	0.00113
18:42:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
18:48:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
18:54:00	0.0000	0.0000	0.0000	0.0000	0.00112	0.00112
19:00:00	0.0000	0.0000	0.0000	0.0000	0.00111	0.00111
19:06:00	0.0000	0.0000	0.0000	0.0000	0.00111	0.00111
19:12:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
19:18:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
19:24:00	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011
19:30:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
19:36:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
19:42:00	0.0000	0.0000	0.0000	0.0000	0.00109	0.00109
19:48:00	0.0000	0.0000	0.0000	0.0000	0.00108	0.00108
19:54:00	0.0000	0.0000	0.0000	0.0000	0.00108	0.00108
20:00:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
20:06:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
20:12:00	0.0000	0.0000	0.0000	0.0000	0.00107	0.00107
20:18:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
20:24:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
20:30:00	0.0000	0.0000	0.0000	0.0000	0.00106	0.00106
20:36:00	0.0000	0.0000	0.0000	0.0000	0.00105	0.00105
20:42:00	0.0000	0.0000	0.0000	0.0000	0.00105	0.00105
20:48:00	0.0000	0.0000	0.0000	0.0000	0.00104	0.00104
20:54:00	0.0000	0.0000	0.0000	0.0000	0.00104	0.00104
21:00:00	0.0000	0.0000	0.0000	0.0000	0.00104	0.00104
21:06:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
21:12:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
21:18:00	0.0000	0.0000	0.0000	0.0000	0.00103	0.00103
21:24:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
21:30:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102
21:36:00	0.0000	0.0000	0.0000	0.0000	0.00102	0.00102
21:42:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
21:48:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
21:54:00	0.0000	0.0000	0.0000	0.0000	0.00101	0.00101
22:00:00	0.0000	0.0000	0.0000	0.0000	0.001	0.001
22:06:00	0.0000	0.0000	0.0000	0.0000	0.000999	0.000999
22:12:00	0.0000	0.0000	0.0000	0.0000	0.000995	0.000995
22:18:00	0.0000	0.0000	0.0000	0.0000	0.000992	0.000992
22:24:00	0.0000	0.0000	0.0000	0.0000	0.000988	0.000988
22:30:00	0.0000	0.0000	0.0000	0.0000	0.000985	0.000985
22:36:00	0.0000	0.0000	0.0000	0.0000	0.000981	0.000981
22:42:00	0.0000	0.0000	0.0000	0.0000	0.000978	0.000978
22:48:00	0.0000	0.0000	0.0000	0.0000	0.000975	0.000975
22:54:00	0.0000	0.0000	0.0000	0.0000	0.000971	0.000971
23:00:00	0.0000	0.0000	0.0000	0.0000	0.000968	0.000968
23:06:00	0.0000	0.0000	0.0000	0.0000	0.000965	0.000965
23:12:00	0.0000	0.0000	0.0000	0.0000	0.000961	0.000961
23:18:00	0.0000	0.0000	0.0000	0.0000	0.000958	0.000958
23:24:00	0.0000	0.0000	0.0000	0.0000	0.000955	0.000955
23:30:00	0.0000	0.0000	0.0000	0.0000	0.000951	0.000951
23:36:00	0.0000	0.0000	0.0000	0.0000	0.000948	0.000948
23:42:00	0.0000	0.0000	0.0000	0.0000	0.000945	0.000945
23:48:00	0.0000	0.0000	0.0000	0.0000	0.000941	0.000941
23:54:00	0.0000	0.0000	0.0000	0.0000	0.000938	0.000938
24:00:00	0.0000	0.0000	0.0000	0.0000	0.000935	0.000935
24:06:00	0.0000	0.0000	0.0000	0.0000	0.000932	0.000932
24:12:00	0.0000	0.0000	0.0000	0.0000	0.000928	0.000928
24:18:00	0.0000	0.0000	0.0000	0.0000	0.000925	0.000925
24:24:00	0.0000	0.0000	0.0000	0.0000	0.000922	0.000922
24:30:00	0.0000	0.0000	0.0000	0.0000	0.000919	0.000919
24:36:00	0.0000	0.0000	0.0000	0.0000	0.000916	0.000916
24:42:00	0.0000	0.0000	0.0000	0.0000	0.000912	0.000912
24:48:00	0.0000	0.0000	0.0000	0.0000	0.000909	0.000909
24:54:00	0.0000	0.0000	0.0000	0.0000	0.000906	0.000906
25:00:00	0.0000	0.0000	0.0000	0.0000	0.000903	0.000903

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
25:06:00	0.0000	0.0000	0.0000	0.0000	0.0009	0.0009
25:12:00	0.0000	0.0000	0.0000	0.0000	0.000897	0.000897
25:18:00	0.0000	0.0000	0.0000	0.0000	0.000894	0.000894
25:24:00	0.0000	0.0000	0.0000	0.0000	0.000891	0.000891
25:30:00	0.0000	0.0000	0.0000	0.0000	0.000888	0.000888
25:36:00	0.0000	0.0000	0.0000	0.0000	0.000884	0.000884
25:42:00	0.0000	0.0000	0.0000	0.0000	0.000881	0.000881
25:48:00	0.0000	0.0000	0.0000	0.0000	0.000878	0.000878
25:54:00	0.0000	0.0000	0.0000	0.0000	0.000875	0.000875
26:00:00	0.0000	0.0000	0.0000	0.0000	0.000872	0.000872
26:06:00	0.0000	0.0000	0.0000	0.0000	0.000869	0.000869
26:12:00	0.0000	0.0000	0.0000	0.0000	0.000866	0.000866
26:18:00	0.0000	0.0000	0.0000	0.0000	0.000863	0.000863
26:24:00	0.0000	0.0000	0.0000	0.0000	0.00086	0.00086
26:30:00	0.0000	0.0000	0.0000	0.0000	0.000857	0.000857
26:36:00	0.0000	0.0000	0.0000	0.0000	0.000854	0.000854
26:42:00	0.0000	0.0000	0.0000	0.0000	0.000851	0.000851
26:48:00	0.0000	0.0000	0.0000	0.0000	0.000848	0.000848
26:54:00	0.0000	0.0000	0.0000	0.0000	0.000845	0.000845
27:00:00	0.0000	0.0000	0.0000	0.0000	0.000843	0.000843
27:06:00	0.0000	0.0000	0.0000	0.0000	0.00084	0.00084
27:12:00	0.0000	0.0000	0.0000	0.0000	0.000837	0.000837
27:18:00	0.0000	0.0000	0.0000	0.0000	0.000834	0.000834
27:24:00	0.0000	0.0000	0.0000	0.0000	0.000831	0.000831
27:30:00	0.0000	0.0000	0.0000	0.0000	0.000828	0.000828
27:36:00	0.0000	0.0000	0.0000	0.0000	0.000825	0.000825
27:42:00	0.0000	0.0000	0.0000	0.0000	0.000822	0.000822
27:48:00	0.0000	0.0000	0.0000	0.0000	0.000819	0.000819
27:54:00	0.0000	0.0000	0.0000	0.0000	0.000817	0.000817
28:00:00	0.0000	0.0000	0.0000	0.0000	0.000814	0.000814
28:06:00	0.0000	0.0000	0.0000	0.0000	0.000811	0.000811
28:12:00	0.0000	0.0000	0.0000	0.0000	0.000808	0.000808
28:18:00	0.0000	0.0000	0.0000	0.0000	0.000805	0.000805
28:24:00	0.0000	0.0000	0.0000	0.0000	0.000803	0.000803
28:30:00	0.0000	0.0000	0.0000	0.0000	0.0008	0.0008
28:36:00	0.0000	0.0000	0.0000	0.0000	0.000797	0.000797

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
28:42:00	0.0000	0.0000	0.0000	0.0000	0.000794	0.000794
28:48:00	0.0000	0.0000	0.0000	0.0000	0.000792	0.000792
28:54:00	0.0000	0.0000	0.0000	0.0000	0.000789	0.000789
29:00:00	0.0000	0.0000	0.0000	0.0000	0.000786	0.000786
29:06:00	0.0000	0.0000	0.0000	0.0000	0.000783	0.000783
29:12:00	0.0000	0.0000	0.0000	0.0000	0.000781	0.000781
29:18:00	0.0000	0.0000	0.0000	0.0000	0.000778	0.000778
29:24:00	0.0000	0.0000	0.0000	0.0000	0.000775	0.000775
29:30:00	0.0000	0.0000	0.0000	0.0000	0.000773	0.000773
29:36:00	0.0000	0.0000	0.0000	0.0000	0.00077	0.00077
29:42:00	0.0000	0.0000	0.0000	0.0000	0.000767	0.000767
29:48:00	0.0000	0.0000	0.0000	0.0000	0.000765	0.000765
29:54:00	0.0000	0.0000	0.0000	0.0000	0.000762	0.000762
30:00:00	0.0000	0.0000	0.0000	0.0000	0.000759	0.000759
30:06:00	0.0000	0.0000	0.0000	0.0000	0.000757	0.000757
30:12:00	0.0000	0.0000	0.0000	0.0000	0.000754	0.000754
30:18:00	0.0000	0.0000	0.0000	0.0000	0.000751	0.000751
30:24:00	0.0000	0.0000	0.0000	0.0000	0.000749	0.000749
30:30:00	0.0000	0.0000	0.0000	0.0000	0.000746	0.000746
30:36:00	0.0000	0.0000	0.0000	0.0000	0.000744	0.000744
30:42:00	0.0000	0.0000	0.0000	0.0000	0.000741	0.000741
30:48:00	0.0000	0.0000	0.0000	0.0000	0.000739	0.000739
30:54:00	0.0000	0.0000	0.0000	0.0000	0.000736	0.000736
31:00:00	0.0000	0.0000	0.0000	0.0000	0.000733	0.000733
31:06:00	0.0000	0.0000	0.0000	0.0000	0.000731	0.000731
31:12:00	0.0000	0.0000	0.0000	0.0000	0.000728	0.000728
31:18:00	0.0000	0.0000	0.0000	0.0000	0.000726	0.000726
31:24:00	0.0000	0.0000	0.0000	0.0000	0.000723	0.000723
31:30:00	0.0000	0.0000	0.0000	0.0000	0.000721	0.000721
31:36:00	0.0000	0.0000	0.0000	0.0000	0.000718	0.000718
31:42:00	0.0000	0.0000	0.0000	0.0000	0.000716	0.000716
31:48:00	0.0000	0.0000	0.0000	0.0000	0.000713	0.000713
31:54:00	0.0000	0.0000	0.0000	0.0000	0.000711	0.000711
32:00:00	0.0000	0.0000	0.0000	0.0000	0.000708	0.000708
32:06:00	0.0000	0.0000	0.0000	0.0000	0.000706	0.000706
32:12:00	0.0000	0.0000	0.0000	0.0000	0.000704	0.000704

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
32:18:00	0.0000	0.0000	0.0000	0.0000	0.000701	0.000701
32:24:00	0.0000	0.0000	0.0000	0.0000	0.000699	0.000699
32:30:00	0.0000	0.0000	0.0000	0.0000	0.000696	0.000696
32:36:00	0.0000	0.0000	0.0000	0.0000	0.000694	0.000694
32:42:00	0.0000	0.0000	0.0000	0.0000	0.000691	0.000691
32:48:00	0.0000	0.0000	0.0000	0.0000	0.000689	0.000689
32:54:00	0.0000	0.0000	0.0000	0.0000	0.000687	0.000687
33:00:00	0.0000	0.0000	0.0000	0.0000	0.000684	0.000684
33:06:00	0.0000	0.0000	0.0000	0.0000	0.000682	0.000682
33:12:00	0.0000	0.0000	0.0000	0.0000	0.00068	0.00068
33:18:00	0.0000	0.0000	0.0000	0.0000	0.000677	0.000677
33:24:00	0.0000	0.0000	0.0000	0.0000	0.000675	0.000675
33:30:00	0.0000	0.0000	0.0000	0.0000	0.000673	0.000673
33:36:00	0.0000	0.0000	0.0000	0.0000	0.00067	0.00067
33:42:00	0.0000	0.0000	0.0000	0.0000	0.000668	0.000668
33:48:00	0.0000	0.0000	0.0000	0.0000	0.000666	0.000666
33:54:00	0.0000	0.0000	0.0000	0.0000	0.000663	0.000663
34:00:00	0.0000	0.0000	0.0000	0.0000	0.000661	0.000661
34:06:00	0.0000	0.0000	0.0000	0.0000	0.000659	0.000659
34:12:00	0.0000	0.0000	0.0000	0.0000	0.000656	0.000656
34:18:00	0.0000	0.0000	0.0000	0.0000	0.000654	0.000654
34:24:00	0.0000	0.0000	0.0000	0.0000	0.000652	0.000652
34:30:00	0.0000	0.0000	0.0000	0.0000	0.00065	0.00065
34:36:00	0.0000	0.0000	0.0000	0.0000	0.000647	0.000647
34:42:00	0.0000	0.0000	0.0000	0.0000	0.000645	0.000645
34:48:00	0.0000	0.0000	0.0000	0.0000	0.000643	0.000643
34:54:00	0.0000	0.0000	0.0000	0.0000	0.000641	0.000641
35:00:00	0.0000	0.0000	0.0000	0.0000	0.000638	0.000638
35:06:00	0.0000	0.0000	0.0000	0.0000	0.000636	0.000636
35:12:00	0.0000	0.0000	0.0000	0.0000	0.000634	0.000634
35:18:00	0.0000	0.0000	0.0000	0.0000	0.000632	0.000632
35:24:00	0.0000	0.0000	0.0000	0.0000	0.00063	0.00063
35:30:00	0.0000	0.0000	0.0000	0.0000	0.000627	0.000627
35:36:00	0.0000	0.0000	0.0000	0.0000	0.000625	0.000625
35:42:00	0.0000	0.0000	0.0000	0.0000	0.000623	0.000623
35:48:00	0.0000	0.0000	0.0000	0.0000	0.000621	0.000621

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:54:00	0.0000	0.0000	0.0000	0.0000	0.000619	0.000619
36:00:00	0.0000	0.0000	0.0000	0.0000	0.000617	0.000617
36:06:00	0.0000	0.0000	0.0000	0.0000	0.000615	0.000615
36:12:00	0.0000	0.0000	0.0000	0.0000	0.000612	0.000612
36:18:00	0.0000	0.0000	0.0000	0.0000	0.00061	0.00061
36:24:00	0.0000	0.0000	0.0000	0.0000	0.000608	0.000608
36:30:00	0.0000	0.0000	0.0000	0.0000	0.000606	0.000606
36:36:00	0.0000	0.0000	0.0000	0.0000	0.000604	0.000604
36:42:00	0.0000	0.0000	0.0000	0.0000	0.000602	0.000602
36:48:00	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006
36:54:00	0.0000	0.0000	0.0000	0.0000	0.000598	0.000598
37:00:00	0.0000	0.0000	0.0000	0.0000	0.000596	0.000596
37:06:00	0.0000	0.0000	0.0000	0.0000	0.000594	0.000594
37:12:00	0.0000	0.0000	0.0000	0.0000	0.000592	0.000592
37:18:00	0.0000	0.0000	0.0000	0.0000	0.00059	0.00059
37:24:00	0.0000	0.0000	0.0000	0.0000	0.000587	0.000587
37:30:00	0.0000	0.0000	0.0000	0.0000	0.000585	0.000585
37:36:00	0.0000	0.0000	0.0000	0.0000	0.000583	0.000583
37:42:00	0.0000	0.0000	0.0000	0.0000	0.000581	0.000581
37:48:00	0.0000	0.0000	0.0000	0.0000	0.000579	0.000579
37:54:00	0.0000	0.0000	0.0000	0.0000	0.000577	0.000577
38:00:00	0.0000	0.0000	0.0000	0.0000	0.000575	0.000575
38:06:00	0.0000	0.0000	0.0000	0.0000	0.000573	0.000573
38:12:00	0.0000	0.0000	0.0000	0.0000	0.000571	0.000571
38:18:00	0.0000	0.0000	0.0000	0.0000	0.000569	0.000569
38:24:00	0.0000	0.0000	0.0000	0.0000	0.000567	0.000567
38:30:00	0.0000	0.0000	0.0000	0.0000	0.000565	0.000565
38:36:00	0.0000	0.0000	0.0000	0.0000	0.000564	0.000564
38:42:00	0.0000	0.0000	0.0000	0.0000	0.000562	0.000562
38:48:00	0.0000	0.0000	0.0000	0.0000	0.00056	0.00056
38:54:00	0.0000	0.0000	0.0000	0.0000	0.000558	0.000558
39:00:00	0.0000	0.0000	0.0000	0.0000	0.000556	0.000556
39:06:00	0.0000	0.0000	0.0000	0.0000	0.000554	0.000554
39:12:00	0.0000	0.0000	0.0000	0.0000	0.000552	0.000552
39:18:00	0.0000	0.0000	0.0000	0.0000	0.00055	0.00055
39:24:00	0.0000	0.0000	0.0000	0.0000	0.000548	0.000548

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
39:30:00	0.0000	0.0000	0.0000	0.0000	0.000546	0.000546
39:36:00	0.0000	0.0000	0.0000	0.0000	0.000544	0.000544
39:42:00	0.0000	0.0000	0.0000	0.0000	0.000542	0.000542
39:48:00	0.0000	0.0000	0.0000	0.0000	0.000541	0.000541
39:54:00	0.0000	0.0000	0.0000	0.0000	0.000539	0.000539
40:00:00	0.0000	0.0000	0.0000	0.0000	0.000537	0.000537
40:06:00	0.0000	0.0000	0.0000	0.0000	0.000535	0.000535
40:12:00	0.0000	0.0000	0.0000	0.0000	0.000533	0.000533
40:18:00	0.0000	0.0000	0.0000	0.0000	0.000531	0.000531
40:24:00	0.0000	0.0000	0.0000	0.0000	0.000529	0.000529
40:30:00	0.0000	0.0000	0.0000	0.0000	0.000528	0.000528
40:36:00	0.0000	0.0000	0.0000	0.0000	0.000526	0.000526
40:42:00	0.0000	0.0000	0.0000	0.0000	0.000524	0.000524
40:48:00	0.0000	0.0000	0.0000	0.0000	0.000522	0.000522
40:54:00	0.0000	0.0000	0.0000	0.0000	0.00052	0.00052
41:00:00	0.0000	0.0000	0.0000	0.0000	0.000519	0.000519
41:06:00	0.0000	0.0000	0.0000	0.0000	0.000517	0.000517
41:12:00	0.0000	0.0000	0.0000	0.0000	0.000515	0.000515
41:18:00	0.0000	0.0000	0.0000	0.0000	0.000513	0.000513
41:24:00	0.0000	0.0000	0.0000	0.0000	0.000511	0.000511
41:30:00	0.0000	0.0000	0.0000	0.0000	0.00051	0.00051
41:36:00	0.0000	0.0000	0.0000	0.0000	0.000508	0.000508
41:42:00	0.0000	0.0000	0.0000	0.0000	0.000506	0.000506
41:48:00	0.0000	0.0000	0.0000	0.0000	0.000504	0.000504
41:54:00	0.0000	0.0000	0.0000	0.0000	0.000503	0.000503
42:00:00	0.0000	0.0000	0.0000	0.0000	0.000501	0.000501
42:06:00	0.0000	0.0000	0.0000	0.0000	0.000499	0.000499
42:12:00	0.0000	0.0000	0.0000	0.0000	0.000497	0.000497
42:18:00	0.0000	0.0000	0.0000	0.0000	0.000496	0.000496
42:24:00	0.0000	0.0000	0.0000	0.0000	0.000494	0.000494
42:30:00	0.0000	0.0000	0.0000	0.0000	0.000492	0.000492
42:36:00	0.0000	0.0000	0.0000	0.0000	0.000491	0.000491
42:42:00	0.0000	0.0000	0.0000	0.0000	0.000489	0.000489
42:48:00	0.0000	0.0000	0.0000	0.0000	0.000487	0.000487
42:54:00	0.0000	0.0000	0.0000	0.0000	0.000485	0.000485
43:00:00	0.0000	0.0000	0.0000	0.0000	0.000484	0.000484

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
43:06:00	0.0000	0.0000	0.0000	0.0000	0.000482	0.000482
43:12:00	0.0000	0.0000	0.0000	0.0000	0.00048	0.00048
43:18:00	0.0000	0.0000	0.0000	0.0000	0.000479	0.000479
43:24:00	0.0000	0.0000	0.0000	0.0000	0.000477	0.000477
43:30:00	0.0000	0.0000	0.0000	0.0000	0.000475	0.000475
43:36:00	0.0000	0.0000	0.0000	0.0000	0.000474	0.000474
43:42:00	0.0000	0.0000	0.0000	0.0000	0.000472	0.000472
43:48:00	0.0000	0.0000	0.0000	0.0000	0.000471	0.000471
43:54:00	0.0000	0.0000	0.0000	0.0000	0.000469	0.000469
44:00:00	0.0000	0.0000	0.0000	0.0000	0.000467	0.000467
44:06:00	0.0000	0.0000	0.0000	0.0000	0.000466	0.000466
44:12:00	0.0000	0.0000	0.0000	0.0000	0.000464	0.000464
44:18:00	0.0000	0.0000	0.0000	0.0000	0.000462	0.000462
44:24:00	0.0000	0.0000	0.0000	0.0000	0.000461	0.000461
44:30:00	0.0000	0.0000	0.0000	0.0000	0.000459	0.000459
44:36:00	0.0000	0.0000	0.0000	0.0000	0.000458	0.000458
44:42:00	0.0000	0.0000	0.0000	0.0000	0.000456	0.000456
44:48:00	0.0000	0.0000	0.0000	0.0000	0.000455	0.000455
44:54:00	0.0000	0.0000	0.0000	0.0000	0.000453	0.000453
45:00:00	0.0000	0.0000	0.0000	0.0000	0.000451	0.000451
45:06:00	0.0000	0.0000	0.0000	0.0000	0.00045	0.00045
45:12:00	0.0000	0.0000	0.0000	0.0000	0.000448	0.000448
45:18:00	0.0000	0.0000	0.0000	0.0000	0.000447	0.000447
45:24:00	0.0000	0.0000	0.0000	0.0000	0.000445	0.000445
45:30:00	0.0000	0.0000	0.0000	0.0000	0.000444	0.000444
45:36:00	0.0000	0.0000	0.0000	0.0000	0.000442	0.000442
45:42:00	0.0000	0.0000	0.0000	0.0000	0.000441	0.000441
45:48:00	0.0000	0.0000	0.0000	0.0000	0.000439	0.000439
45:54:00	0.0000	0.0000	0.0000	0.0000	0.000438	0.000438
46:00:00	0.0000	0.0000	0.0000	0.0000	0.000436	0.000436
46:06:00	0.0000	0.0000	0.0000	0.0000	0.000434	0.000434
46:12:00	0.0000	0.0000	0.0000	0.0000	0.000433	0.000433
46:18:00	0.0000	0.0000	0.0000	0.0000	0.000431	0.000431
46:24:00	0.0000	0.0000	0.0000	0.0000	0.00043	0.00043
46:30:00	0.0000	0.0000	0.0000	0.0000	0.000428	0.000428
46:36:00	0.0000	0.0000	0.0000	0.0000	0.000427	0.000427

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
46:42:00	0.0000	0.0000	0.0000	0.0000	0.000426	0.000426
46:48:00	0.0000	0.0000	0.0000	0.0000	0.000424	0.000424
46:54:00	0.0000	0.0000	0.0000	0.0000	0.000423	0.000423
47:00:00	0.0000	0.0000	0.0000	0.0000	0.000421	0.000421
47:06:00	0.0000	0.0000	0.0000	0.0000	0.00042	0.00042
47:12:00	0.0000	0.0000	0.0000	0.0000	0.000418	0.000418
47:18:00	0.0000	0.0000	0.0000	0.0000	0.000417	0.000417
47:24:00	0.0000	0.0000	0.0000	0.0000	0.000415	0.000415
47:30:00	0.0000	0.0000	0.0000	0.0000	0.000414	0.000414
47:36:00	0.0000	0.0000	0.0000	0.0000	0.000412	0.000412
47:42:00	0.0000	0.0000	0.0000	0.0000	0.000411	0.000411
47:48:00	0.0000	0.0000	0.0000	0.0000	0.00041	0.00041
47:54:00	0.0000	0.0000	0.0000	0.0000	0.000408	0.000408
48:00:00	0.0000	0.0000	0.0000	0.0000	0.000407	0.000407
48:06:00	0.0000	0.0000	0.0000	0.0000	0.000405	0.000405
48:12:00	0.0000	0.0000	0.0000	0.0000	0.000404	0.000404
48:18:00	0.0000	0.0000	0.0000	0.0000	0.000403	0.000403
48:24:00	0.0000	0.0000	0.0000	0.0000	0.000401	0.000401
48:30:00	0.0000	0.0000	0.0000	0.0000	0.0004	0.0004
48:36:00	0.0000	0.0000	0.0000	0.0000	0.000398	0.000398
48:42:00	0.0000	0.0000	0.0000	0.0000	0.000397	0.000397
48:48:00	0.0000	0.0000	0.0000	0.0000	0.000396	0.000396
48:54:00	0.0000	0.0000	0.0000	0.0000	0.000394	0.000394
49:00:00	0.0000	0.0000	0.0000	0.0000	0.000393	0.000393
49:06:00	0.0000	0.0000	0.0000	0.0000	0.000392	0.000392
49:12:00	0.0000	0.0000	0.0000	0.0000	0.00039	0.00039
49:18:00	0.0000	0.0000	0.0000	0.0000	0.000389	0.000389
49:24:00	0.0000	0.0000	0.0000	0.0000	0.000388	0.000388
49:30:00	0.0000	0.0000	0.0000	0.0000	0.000386	0.000386
49:36:00	0.0000	0.0000	0.0000	0.0000	0.000385	0.000385
49:42:00	0.0000	0.0000	0.0000	0.0000	0.000383	0.000383
49:48:00	0.0000	0.0000	0.0000	0.0000	0.000382	0.000382
49:54:00	0.0000	0.0000	0.0000	0.0000	0.000381	0.000381
50:00:00	0.0000	0.0000	0.0000	0.0000	0.00038	0.00038
50:06:00	0.0000	0.0000	0.0000	0.0000	0.000378	0.000378
50:12:00	0.0000	0.0000	0.0000	0.0000	0.000377	0.000377

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
50:18:00	0.0000	0.0000	0.0000	0.0000	0.000376	0.000376
50:24:00	0.0000	0.0000	0.0000	0.0000	0.000374	0.000374
50:30:00	0.0000	0.0000	0.0000	0.0000	0.000373	0.000373
50:36:00	0.0000	0.0000	0.0000	0.0000	0.000372	0.000372
50:42:00	0.0000	0.0000	0.0000	0.0000	0.00037	0.00037
50:48:00	0.0000	0.0000	0.0000	0.0000	0.000369	0.000369
50:54:00	0.0000	0.0000	0.0000	0.0000	0.000368	0.000368
51:00:00	0.0000	0.0000	0.0000	0.0000	0.000367	0.000367
51:06:00	0.0000	0.0000	0.0000	0.0000	0.000365	0.000365
51:12:00	0.0000	0.0000	0.0000	0.0000	0.000364	0.000364
51:18:00	0.0000	0.0000	0.0000	0.0000	0.000363	0.000363
51:24:00	0.0000	0.0000	0.0000	0.0000	0.000362	0.000362
51:30:00	0.0000	0.0000	0.0000	0.0000	0.00036	0.00036
51:36:00	0.0000	0.0000	0.0000	0.0000	0.000359	0.000359
51:42:00	0.0000	0.0000	0.0000	0.0000	0.000358	0.000358
51:48:00	0.0000	0.0000	0.0000	0.0000	0.000357	0.000357
51:54:00	0.0000	0.0000	0.0000	0.0000	0.000355	0.000355
52:00:00	0.0000	0.0000	0.0000	0.0000	0.000354	0.000354
52:06:00	0.0000	0.0000	0.0000	0.0000	0.000353	0.000353
52:12:00	0.0000	0.0000	0.0000	0.0000	0.000352	0.000352
52:18:00	0.0000	0.0000	0.0000	0.0000	0.00035	0.00035
52:24:00	0.0000	0.0000	0.0000	0.0000	0.000349	0.000349
52:30:00	0.0000	0.0000	0.0000	0.0000	0.000348	0.000348
52:36:00	0.0000	0.0000	0.0000	0.0000	0.000347	0.000347
52:42:00	0.0000	0.0000	0.0000	0.0000	0.000346	0.000346
52:48:00	0.0000	0.0000	0.0000	0.0000	0.000344	0.000344
52:54:00	0.0000	0.0000	0.0000	0.0000	0.000343	0.000343
53:00:00	0.0000	0.0000	0.0000	0.0000	0.000342	0.000342
53:06:00	0.0000	0.0000	0.0000	0.0000	0.000341	0.000341
53:12:00	0.0000	0.0000	0.0000	0.0000	0.00034	0.00034
53:18:00	0.0000	0.0000	0.0000	0.0000	0.000338	0.000338
53:24:00	0.0000	0.0000	0.0000	0.0000	0.000337	0.000337
53:30:00	0.0000	0.0000	0.0000	0.0000	0.000336	0.000336
53:36:00	0.0000	0.0000	0.0000	0.0000	0.000335	0.000335
53:42:00	0.0000	0.0000	0.0000	0.0000	0.000334	0.000334
53:48:00	0.0000	0.0000	0.0000	0.0000	0.000333	0.000333

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
53:54:00	0.0000	0.0000	0.0000	0.0000	0.000332	0.000332
54:00:00	0.0000	0.0000	0.0000	0.0000	0.00033	0.00033
54:06:00	0.0000	0.0000	0.0000	0.0000	0.000329	0.000329
54:12:00	0.0000	0.0000	0.0000	0.0000	0.000328	0.000328
54:18:00	0.0000	0.0000	0.0000	0.0000	0.000327	0.000327
54:24:00	0.0000	0.0000	0.0000	0.0000	0.000326	0.000326
54:30:00	0.0000	0.0000	0.0000	0.0000	0.000325	0.000325
54:36:00	0.0000	0.0000	0.0000	0.0000	0.000324	0.000324
54:42:00	0.0000	0.0000	0.0000	0.0000	0.000322	0.000322
54:48:00	0.0000	0.0000	0.0000	0.0000	0.000321	0.000321
54:54:00	0.0000	0.0000	0.0000	0.0000	0.00032	0.00032
55:00:00	0.0000	0.0000	0.0000	0.0000	0.000319	0.000319
55:06:00	0.0000	0.0000	0.0000	0.0000	0.000318	0.000318
55:12:00	0.0000	0.0000	0.0000	0.0000	0.000317	0.000317
55:18:00	0.0000	0.0000	0.0000	0.0000	0.000316	0.000316
55:24:00	0.0000	0.0000	0.0000	0.0000	0.000315	0.000315
55:30:00	0.0000	0.0000	0.0000	0.0000	0.000314	0.000314
55:36:00	0.0000	0.0000	0.0000	0.0000	0.000313	0.000313
55:42:00	0.0000	0.0000	0.0000	0.0000	0.000311	0.000311
55:48:00	0.0000	0.0000	0.0000	0.0000	0.00031	0.00031
55:54:00	0.0000	0.0000	0.0000	0.0000	0.000309	0.000309
56:00:00	0.0000	0.0000	0.0000	0.0000	0.000308	0.000308
56:06:00	0.0000	0.0000	0.0000	0.0000	0.000307	0.000307
56:12:00	0.0000	0.0000	0.0000	0.0000	0.000306	0.000306
56:18:00	0.0000	0.0000	0.0000	0.0000	0.000305	0.000305
56:24:00	0.0000	0.0000	0.0000	0.0000	0.000304	0.000304
56:30:00	0.0000	0.0000	0.0000	0.0000	0.000303	0.000303
56:36:00	0.0000	0.0000	0.0000	0.0000	0.000302	0.000302
56:42:00	0.0000	0.0000	0.0000	0.0000	0.000301	0.000301
56:48:00	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
56:54:00	0.0000	0.0000	0.0000	0.0000	0.000299	0.000299
57:00:00	0.0000	0.0000	0.0000	0.0000	0.000298	0.000298
57:06:00	0.0000	0.0000	0.0000	0.0000	0.000297	0.000297
57:12:00	0.0000	0.0000	0.0000	0.0000	0.000296	0.000296
57:18:00	0.0000	0.0000	0.0000	0.0000	0.000295	0.000295
57:24:00	0.0000	0.0000	0.0000	0.0000	0.000294	0.000294

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
57:30:00	0.0000	0.0000	0.0000	0.0000	0.000293	0.000293
57:36:00	0.0000	0.0000	0.0000	0.0000	0.000292	0.000292
57:42:00	0.0000	0.0000	0.0000	0.0000	0.000291	0.000291
57:48:00	0.0000	0.0000	0.0000	0.0000	0.00029	0.00029
57:54:00	0.0000	0.0000	0.0000	0.0000	0.000289	0.000289
58:00:00	0.0000	0.0000	0.0000	0.0000	0.000288	0.000288
58:06:00	0.0000	0.0000	0.0000	0.0000	0.000287	0.000287
58:12:00	0.0000	0.0000	0.0000	0.0000	0.000286	0.000286
58:18:00	0.0000	0.0000	0.0000	0.0000	0.000285	0.000285
58:24:00	0.0000	0.0000	0.0000	0.0000	0.000284	0.000284
58:30:00	0.0000	0.0000	0.0000	0.0000	0.000283	0.000283
58:36:00	0.0000	0.0000	0.0000	0.0000	0.000282	0.000282
58:42:00	0.0000	0.0000	0.0000	0.0000	0.000281	0.000281
58:48:00	0.0000	0.0000	0.0000	0.0000	0.00028	0.00028
58:54:00	0.0000	0.0000	0.0000	0.0000	0.000279	0.000279
59:00:00	0.0000	0.0000	0.0000	0.0000	0.000278	0.000278
59:06:00	0.0000	0.0000	0.0000	0.0000	0.000277	0.000277
59:12:00	0.0000	0.0000	0.0000	0.0000	0.000276	0.000276
59:18:00	0.0000	0.0000	0.0000	0.0000	0.000275	0.000275
59:24:00	0.0000	0.0000	0.0000	0.0000	0.000274	0.000274
59:30:00	0.0000	0.0000	0.0000	0.0000	0.000273	0.000273
59:36:00	0.0000	0.0000	0.0000	0.0000	0.000272	0.000272
59:42:00	0.0000	0.0000	0.0000	0.0000	0.000271	0.000271
59:48:00	0.0000	0.0000	0.0000	0.0000	0.00027	0.00027
59:54:00	0.0000	0.0000	0.0000	0.0000	0.000269	0.000269
60:00:00	0.0000	0.0000	0.0000	0.0000	0.000268	0.000268
60:06:00	0.0000	0.0000	0.0000	0.0000	0.000267	0.000267
60:12:00	0.0000	0.0000	0.0000	0.0000	0.000266	0.000266
60:18:00	0.0000	0.0000	0.0000	0.0000	0.000266	0.000266
60:24:00	0.0000	0.0000	0.0000	0.0000	0.000265	0.000265
60:30:00	0.0000	0.0000	0.0000	0.0000	0.000264	0.000264
60:36:00	0.0000	0.0000	0.0000	0.0000	0.000263	0.000263
60:42:00	0.0000	0.0000	0.0000	0.0000	0.000262	0.000262
60:48:00	0.0000	0.0000	0.0000	0.0000	0.000261	0.000261
60:54:00	0.0000	0.0000	0.0000	0.0000	0.00026	0.00026
61:00:00	0.0000	0.0000	0.0000	0.0000	0.000259	0.000259

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
61:06:00	0.0000	0.0000	0.0000	0.0000	0.000258	0.000258
61:12:00	0.0000	0.0000	0.0000	0.0000	0.000257	0.000257
61:18:00	0.0000	0.0000	0.0000	0.0000	0.000257	0.000257
61:24:00	0.0000	0.0000	0.0000	0.0000	0.000256	0.000256
61:30:00	0.0000	0.0000	0.0000	0.0000	0.000255	0.000255
61:36:00	0.0000	0.0000	0.0000	0.0000	0.000254	0.000254
61:42:00	0.0000	0.0000	0.0000	0.0000	0.000253	0.000253
61:48:00	0.0000	0.0000	0.0000	0.0000	0.000252	0.000252
61:54:00	0.0000	0.0000	0.0000	0.0000	0.000251	0.000251
62:00:00	0.0000	0.0000	0.0000	0.0000	0.00025	0.00025
62:06:00	0.0000	0.0000	0.0000	0.0000	0.000249	0.000249
62:12:00	0.0000	0.0000	0.0000	0.0000	0.000249	0.000249
62:18:00	0.0000	0.0000	0.0000	0.0000	0.000248	0.000248
62:24:00	0.0000	0.0000	0.0000	0.0000	0.000247	0.000247
62:30:00	0.0000	0.0000	0.0000	0.0000	0.000246	0.000246
62:36:00	0.0000	0.0000	0.0000	0.0000	0.000245	0.000245
62:42:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
62:48:00	0.0000	0.0000	0.0000	0.0000	0.000244	0.000244
62:54:00	0.0000	0.0000	0.0000	0.0000	0.000243	0.000243
63:00:00	0.0000	0.0000	0.0000	0.0000	0.000242	0.000242
63:06:00	0.0000	0.0000	0.0000	0.0000	0.000241	0.000241
63:12:00	0.0000	0.0000	0.0000	0.0000	0.00024	0.00024
63:18:00	0.0000	0.0000	0.0000	0.0000	0.000239	0.000239
63:24:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
63:30:00	0.0000	0.0000	0.0000	0.0000	0.000238	0.000238
63:36:00	0.0000	0.0000	0.0000	0.0000	0.000237	0.000237
63:42:00	0.0000	0.0000	0.0000	0.0000	0.000236	0.000236
63:48:00	0.0000	0.0000	0.0000	0.0000	0.000235	0.000235
63:54:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234
64:00:00	0.0000	0.0000	0.0000	0.0000	0.000234	0.000234
64:06:00	0.0000	0.0000	0.0000	0.0000	0.000233	0.000233
64:12:00	0.0000	0.0000	0.0000	0.0000	0.000232	0.000232
64:18:00	0.0000	0.0000	0.0000	0.0000	0.000231	0.000231
64:24:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
64:30:00	0.0000	0.0000	0.0000	0.0000	0.00023	0.00023
64:36:00	0.0000	0.0000	0.0000	0.0000	0.000229	0.000229

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
64:42:00	0.0000	0.0000	0.0000	0.0000	0.000228	0.000228
64:48:00	0.0000	0.0000	0.0000	0.0000	0.000227	0.000227
64:54:00	0.0000	0.0000	0.0000	0.0000	0.000226	0.000226
65:00:00	0.0000	0.0000	0.0000	0.0000	0.000226	0.000226
65:06:00	0.0000	0.0000	0.0000	0.0000	0.000225	0.000225
65:12:00	0.0000	0.0000	0.0000	0.0000	0.000224	0.000224
65:18:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
65:24:00	0.0000	0.0000	0.0000	0.0000	0.000223	0.000223
65:30:00	0.0000	0.0000	0.0000	0.0000	0.000222	0.000222
65:36:00	0.0000	0.0000	0.0000	0.0000	0.000221	0.000221
65:42:00	0.0000	0.0000	0.0000	0.0000	0.00022	0.00022
65:48:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
65:54:00	0.0000	0.0000	0.0000	0.0000	0.000219	0.000219
66:00:00	0.0000	0.0000	0.0000	0.0000	0.000218	0.000218
66:06:00	0.0000	0.0000	0.0000	0.0000	0.000217	0.000217
66:12:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
66:18:00	0.0000	0.0000	0.0000	0.0000	0.000216	0.000216
66:24:00	0.0000	0.0000	0.0000	0.0000	0.000215	0.000215
66:30:00	0.0000	0.0000	0.0000	0.0000	0.000214	0.000214
66:36:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
66:42:00	0.0000	0.0000	0.0000	0.0000	0.000213	0.000213
66:48:00	0.0000	0.0000	0.0000	0.0000	0.000212	0.000212
66:54:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
67:00:00	0.0000	0.0000	0.0000	0.0000	0.000211	0.000211
67:06:00	0.0000	0.0000	0.0000	0.0000	0.00021	0.00021
67:12:00	0.0000	0.0000	0.0000	0.0000	0.000209	0.000209
67:18:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
67:24:00	0.0000	0.0000	0.0000	0.0000	0.000208	0.000208
67:30:00	0.0000	0.0000	0.0000	0.0000	0.000207	0.000207
67:36:00	0.0000	0.0000	0.0000	0.0000	0.000206	0.000206
67:42:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
67:48:00	0.0000	0.0000	0.0000	0.0000	0.000205	0.000205
67:54:00	0.0000	0.0000	0.0000	0.0000	0.000204	0.000204
68:00:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
68:06:00	0.0000	0.0000	0.0000	0.0000	0.000203	0.000203
68:12:00	0.0000	0.0000	0.0000	0.0000	0.000202	0.000202

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
68:18:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201
68:24:00	0.0000	0.0000	0.0000	0.0000	0.000201	0.000201

Appendix

Catchment descriptors

Name	Value	User-defined value used?
BFIHOST	0.63	No
BFIHOST19	0.64	No
PROPWET (mm)	0.51	No
SAAR (mm)	837	No

APPENDIX 04

Post-Development Surface Water Runoff Calculations

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Upstream Structures	Outflow To	Overflow To
(None)	South Wetland.SRCX	(None)

Half Drain Time : 370 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	98.931	0.191	0.0	9.0	9.0	199.9	O K
30 min Summer	99.005	0.265	0.0	11.2	11.2	276.7	O K
60 min Summer	99.085	0.345	0.0	13.1	13.1	360.2	O K
120 min Summer	99.191	0.451	0.0	15.3	15.3	471.1	O K
180 min Summer	99.244	0.504	0.0	16.3	16.3	527.1	O K
240 min Summer	99.275	0.535	0.0	16.9	16.9	559.3	O K
360 min Summer	99.312	0.572	0.0	17.5	17.5	598.2	O K
480 min Summer	99.333	0.593	0.0	17.9	17.9	619.9	O K
600 min Summer	99.345	0.605	0.0	18.1	18.1	632.2	O K
720 min Summer	99.351	0.611	0.0	18.2	18.2	638.4	O K
960 min Summer	99.352	0.612	0.0	18.2	18.2	639.9	O K
1440 min Summer	99.334	0.594	0.0	17.9	17.9	620.7	O K
2160 min Summer	99.295	0.555	0.0	17.2	17.2	580.2	O K
2880 min Summer	99.257	0.517	0.0	16.6	16.6	540.4	O K
4320 min Summer	99.194	0.454	0.0	15.4	15.4	474.0	O K
5760 min Summer	99.146	0.406	0.0	14.4	14.4	424.6	O K
7200 min Summer	99.111	0.371	0.0	13.7	13.7	387.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	32.688	0.0	182.2	27
30 min Summer	21.745	0.0	262.9	41
60 min Summer	14.031	0.0	373.7	68
120 min Summer	9.358	0.0	516.3	126
180 min Summer	7.239	0.0	607.2	182
240 min Summer	6.000	0.0	676.0	240
360 min Summer	4.584	0.0	780.8	296
480 min Summer	3.761	0.0	857.5	358
600 min Summer	3.217	0.0	918.6	426
720 min Summer	2.827	0.0	969.7	496
960 min Summer	2.303	0.0	1053.0	632
1440 min Summer	1.718	0.0	1173.4	906
2160 min Summer	1.288	0.0	1338.0	1304
2880 min Summer	1.055	0.0	1455.7	1700
4320 min Summer	0.805	0.0	1647.0	2460
5760 min Summer	0.671	0.0	1833.6	3176
7200 min Summer	0.588	0.0	1994.9	3904

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.084	0.344	0.0	13.1	13.1	359.1	O K
10080 min Summer	99.062	0.322	0.0	12.6	12.6	336.4	O K
15 min Winter	98.959	0.219	0.0	9.9	9.9	229.3	O K
30 min Winter	99.042	0.302	0.0	12.1	12.1	315.8	O K
60 min Winter	99.133	0.393	0.0	14.2	14.2	410.2	O K
120 min Winter	99.253	0.513	0.0	16.5	16.5	536.4	O K
180 min Winter	99.315	0.575	0.0	17.6	17.6	601.3	O K
240 min Winter	99.352	0.612	0.0	18.2	18.2	639.8	O K
360 min Winter	99.390	0.650	0.0	18.8	18.8	679.3	O K
480 min Winter	99.403	0.663	0.0	19.0	19.0	700.2	O K
600 min Winter	99.405	0.665	0.0	19.1	19.1	709.9	O K
720 min Winter	99.406	0.666	0.0	19.1	19.1	711.9	O K
960 min Winter	99.403	0.663	0.0	19.0	19.0	702.6	O K
1440 min Winter	99.372	0.632	0.0	18.5	18.5	660.6	O K
2160 min Winter	99.306	0.566	0.0	17.4	17.4	591.4	O K
2880 min Winter	99.247	0.507	0.0	16.4	16.4	529.7	O K
4320 min Winter	99.155	0.415	0.0	14.6	14.6	433.6	O K
5760 min Winter	99.091	0.351	0.0	13.3	13.3	366.6	O K
7200 min Winter	99.046	0.306	0.0	12.2	12.2	319.6	O K
8640 min Winter	99.013	0.273	0.0	11.4	11.4	285.2	O K
10080 min Winter	98.988	0.248	0.0	10.7	10.7	259.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	0.531	0.0	2147.0	4664
10080 min Summer	0.489	0.0	2289.9	5352
15 min Winter	32.688	0.0	211.7	28
30 min Winter	21.745	0.0	302.0	41
60 min Winter	14.031	0.0	425.4	68
120 min Winter	9.358	0.0	585.3	124
180 min Winter	7.239	0.0	687.3	180
240 min Winter	6.000	0.0	764.5	236
360 min Winter	4.584	0.0	882.3	334
480 min Winter	3.761	0.0	968.4	380
600 min Winter	3.217	0.0	1037.1	458
720 min Winter	2.827	0.0	1094.7	534
960 min Winter	2.303	0.0	1188.6	684
1440 min Winter	1.718	0.0	1324.5	974
2160 min Winter	1.288	0.0	1509.9	1388
2880 min Winter	1.055	0.0	1643.6	1792
4320 min Winter	0.805	0.0	1862.7	2556
5760 min Winter	0.671	0.0	2073.6	3296
7200 min Winter	0.588	0.0	2258.1	4040
8640 min Winter	0.531	0.0	2432.8	4760
10080 min Winter	0.489	0.0	2598.2	5456

Cascade Rainfall Details for V2 Permeable Paving - Lorry Park.SRCX

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.617

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.539	4	8	0.539	8	12	0.539

Time Area Diagram

Total Area (ha) 0.423

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.141	8	12	0.141	12	16	0.141

Time Area Diagram

Total Area (ha) 0.371

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.123	4	8	0.124	8	12	0.124

Time Area Diagram

Total Area (ha) 0.744

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.248	8	12	0.248	12	16	0.248

Time Area Diagram

Total Area (ha) 0.089

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.000	8	12	0.089

Time Area Diagram

Total Area (ha) 0.879

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.466	4	8	0.413

Cascade Model Details for V2 Permeable Paving - Lorry Park.SRCX

Storage is Online Cover Level (m) 100.000

Complex Structure

Cellular Storage

Invert Level (m) 98.740 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1100.0	1100.0	0.660	1100.0	1187.6

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	38.0
Membrane Percolation (mm/hr)	1000	Length (m)	238.0
Max Percolation (l/s)	2512.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	99.400	Membrane Depth (m)	0

Complex Outflow Control

Orifice

Diameter (m) 0.108 Discharge Coefficient 0.600 Invert Level (m) 98.740

Orifice

Diameter (m) 0.127 Discharge Coefficient 0.600 Invert Level (m) 99.400

Cascade Summary of Results for South Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
V2 Permeable Paving - Lorry Park.SRCX	North Wetland.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	88.465	0.065	1.4	157.2	O K
30 min Summer	88.489	0.089	2.2	217.6	O K
60 min Summer	88.518	0.118	3.0	290.2	O K
120 min Summer	88.563	0.163	3.7	404.0	O K
180 min Summer	88.592	0.192	4.1	477.3	O K
240 min Summer	88.614	0.214	4.3	533.1	O K
360 min Summer	88.647	0.247	4.7	618.5	O K
480 min Summer	88.670	0.270	5.0	680.9	O K
600 min Summer	88.689	0.289	5.2	730.6	O K
720 min Summer	88.705	0.305	5.3	771.9	O K
960 min Summer	88.727	0.327	6.1	832.5	O K
1440 min Summer	88.752	0.352	7.6	899.7	O K
2160 min Summer	88.770	0.370	9.2	947.7	O K
2880 min Summer	88.774	0.374	9.7	960.9	O K
4320 min Summer	88.781	0.381	10.4	978.3	O K
5760 min Summer	88.784	0.384	10.7	988.3	O K
7200 min Summer	88.786	0.386	11.0	993.5	O K
8640 min Summer	88.787	0.387	11.0	995.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	32.688	0.0	94.1	608
30 min Summer	21.745	0.0	150.7	602
60 min Summer	14.031	0.0	328.4	642
120 min Summer	9.358	0.0	456.5	768
180 min Summer	7.239	0.0	528.2	860
240 min Summer	6.000	0.0	574.9	934
360 min Summer	4.584	0.0	630.8	1058
480 min Summer	3.761	0.0	662.8	1162
600 min Summer	3.217	0.0	682.6	1256
720 min Summer	2.827	0.0	695.0	1342
960 min Summer	2.303	0.0	714.5	1486
1440 min Summer	1.718	0.0	740.2	1754
2160 min Summer	1.288	0.0	1385.1	2160
2880 min Summer	1.055	0.0	1460.0	2500
4320 min Summer	0.805	0.0	1489.9	3172
5760 min Summer	0.671	0.0	2093.8	3888
7200 min Summer	0.588	0.0	2267.3	4616
8640 min Summer	0.531	0.0	2414.4	5352

Cascade Summary of Results for South Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	88.787	0.387	11.0	994.9	O K
15 min Winter	88.474	0.074	1.7	179.5	O K
30 min Winter	88.501	0.101	2.6	246.5	O K
60 min Winter	88.535	0.135	3.2	331.1	O K
120 min Winter	88.585	0.185	4.0	459.3	O K
180 min Winter	88.617	0.217	4.4	541.8	O K
240 min Winter	88.641	0.241	4.6	604.6	O K
360 min Winter	88.678	0.278	5.0	700.6	O K
480 min Winter	88.704	0.304	5.3	770.6	O K
600 min Winter	88.723	0.323	5.9	822.1	O K
720 min Winter	88.737	0.337	6.6	859.7	O K
960 min Winter	88.756	0.356	7.9	909.4	O K
1440 min Winter	88.775	0.375	9.8	963.5	O K
2160 min Winter	88.791	0.391	11.4	1005.0	O K
2880 min Winter	88.794	0.394	11.8	1014.3	O K
4320 min Winter	88.797	0.397	12.3	1022.9	O K
5760 min Winter	88.796	0.396	12.0	1019.4	O K
7200 min Winter	88.793	0.393	11.6	1010.9	O K
8640 min Winter	88.789	0.389	11.2	1000.8	O K
10080 min Winter	88.785	0.385	10.9	990.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.489	0.0	2518.8	6080
15 min Winter	32.688	0.0	114.8	602
30 min Winter	21.745	0.0	178.2	599
60 min Winter	14.031	0.0	376.8	674
120 min Winter	9.358	0.0	513.9	814
180 min Winter	7.239	0.0	586.5	910
240 min Winter	6.000	0.0	631.0	986
360 min Winter	4.584	0.0	687.4	1116
480 min Winter	3.761	0.0	719.8	1220
600 min Winter	3.217	0.0	745.8	1300
720 min Winter	2.827	0.0	770.7	1368
960 min Winter	2.303	0.0	815.5	1494
1440 min Winter	1.718	0.0	872.5	1710
2160 min Winter	1.288	0.0	1571.6	2112
2880 min Winter	1.055	0.0	1661.0	2468
4320 min Winter	0.805	0.0	1714.5	3168
5760 min Winter	0.671	0.0	2370.0	3928
7200 min Winter	0.588	0.0	2568.2	4680
8640 min Winter	0.531	0.0	2734.2	5432
10080 min Winter	0.489	0.0	2844.8	6160

Cascade Rainfall Details for South Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.300

Time (mins) From:	To:	Area (ha)
0	4	0.300

Cascade Model Details for South Wetland.SRCX

Storage is Online Cover Level (m) 89.000

Tank or Pond Structure

Invert Level (m) 88.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2400.0	0.600	2949.3

Complex Outflow Control

Orifice

Diameter (m) 0.070 Discharge Coefficient 0.600 Invert Level (m) 88.400

Orifice

Diameter (m) 0.205 Discharge Coefficient 0.600 Invert Level (m) 88.700

Cascade Summary of Results for North Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
South Wetland.SRCX	(None)	(None)
V2 Permeable Paving - Lorry Park.SRCX		

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	83.452	0.052	1.3	28.1	O K
30 min Summer	83.469	0.069	2.1	37.3	O K
60 min Summer	83.485	0.085	2.9	46.1	O K
120 min Summer	83.498	0.098	3.6	53.2	O K
180 min Summer	83.505	0.105	4.0	57.3	O K
240 min Summer	83.510	0.110	4.3	60.2	O K
360 min Summer	83.517	0.117	4.8	64.3	O K
480 min Summer	83.522	0.122	5.1	67.0	O K
600 min Summer	83.525	0.125	5.3	69.0	O K
720 min Summer	83.528	0.128	5.4	70.5	O K
960 min Summer	83.536	0.136	5.9	75.0	O K
1440 min Summer	83.566	0.166	7.1	92.7	O K
2160 min Summer	83.613	0.213	8.4	121.5	O K
2880 min Summer	83.641	0.241	9.1	138.7	O K
4320 min Summer	83.667	0.267	9.7	154.9	O K
5760 min Summer	83.684	0.284	10.1	166.3	O K
7200 min Summer	83.697	0.297	10.4	174.6	O K
8640 min Summer	83.705	0.305	10.5	179.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	32.688	0.0	95.7	832
30 min Summer	21.745	0.0	155.2	823
60 min Summer	14.031	0.0	351.0	862
120 min Summer	9.358	0.0	489.0	956
180 min Summer	7.239	0.0	563.7	168
240 min Summer	6.000	0.0	612.3	192
360 min Summer	4.584	0.0	674.3	258
480 min Summer	3.761	0.0	711.3	334
600 min Summer	3.217	0.0	735.2	404
720 min Summer	2.827	0.0	751.0	472
960 min Summer	2.303	0.0	776.6	1616
1440 min Summer	1.718	0.0	812.0	1922
2160 min Summer	1.288	0.0	1503.6	2340
2880 min Summer	1.055	0.0	1583.8	2776
4320 min Summer	0.805	0.0	1626.3	3476
5760 min Summer	0.671	0.0	2296.5	4200
7200 min Summer	0.588	0.0	2486.6	4936
8640 min Summer	0.531	0.0	2646.2	5688

Cascade Summary of Results for North Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	83.710	0.310	10.6	183.3	O K
15 min Winter	83.458	0.058	1.6	31.0	O K
30 min Winter	83.478	0.078	2.5	42.3	O K
60 min Winter	83.490	0.090	3.2	48.9	O K
120 min Winter	83.508	0.108	4.2	59.3	O K
180 min Winter	83.517	0.117	4.8	64.2	O K
240 min Winter	83.522	0.122	5.1	67.2	O K
360 min Winter	83.530	0.130	5.6	71.6	O K
480 min Winter	83.534	0.134	5.8	74.1	O K
600 min Winter	83.537	0.137	6.0	75.8	O K
720 min Winter	83.543	0.143	6.4	79.3	O K
960 min Winter	83.572	0.172	7.3	96.5	O K
1440 min Winter	83.626	0.226	8.8	129.2	O K
2160 min Winter	83.687	0.287	10.2	167.8	O K
2880 min Winter	83.720	0.320	10.9	189.9	O K
4320 min Winter	83.739	0.339	11.4	202.4	O K
5760 min Winter	83.744	0.344	11.6	205.4	O K
7200 min Winter	83.741	0.341	11.5	203.8	O K
8640 min Winter	83.735	0.335	11.2	199.3	O K
10080 min Winter	83.724	0.324	10.9	192.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.489	0.0	2758.3	6432
15 min Winter	32.688	0.0	117.8	786
30 min Winter	21.745	0.0	183.1	844
60 min Winter	14.031	0.0	403.6	874
120 min Winter	9.358	0.0	549.1	116
180 min Winter	7.239	0.0	624.8	172
240 min Winter	6.000	0.0	673.8	226
360 min Winter	4.584	0.0	738.0	274
480 min Winter	3.761	0.0	776.5	352
600 min Winter	3.217	0.0	807.6	430
720 min Winter	2.827	0.0	837.1	1504
960 min Winter	2.303	0.0	890.0	1680
1440 min Winter	1.718	0.0	957.7	1946
2160 min Winter	1.288	0.0	1706.2	2372
2880 min Winter	1.055	0.0	1803.8	2812
4320 min Winter	0.805	0.0	1872.9	3516
5760 min Winter	0.671	0.0	2598.2	4256
7200 min Winter	0.588	0.0	2814.7	5032
8640 min Winter	0.531	0.0	2995.3	5800
10080 min Winter	0.489	0.0	3111.4	6560

Cascade Rainfall Details for North Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.086

Time (mins) From:	To:	Area (ha)
0	4	0.086

Cascade Model Details for North Wetland.SRCX

Storage is Online Cover Level (m) 84.000

Tank or Pond Structure

Invert Level (m) 83.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	525.0	0.600	796.9

Complex Outflow Control

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 83.400

Orifice

Diameter (m) 0.200 Discharge Coefficient 0.600 Invert Level (m) 83.725

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Upstream Structures	Outflow To	Overflow To
(None)	South Wetland.SRCX	(None)

Half Drain Time : 458 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.293	0.553	0.0	17.2	17.2	578.0	O K
30 min Summer	99.428	0.688	0.0	19.8	19.8	796.3	O K
60 min Summer	99.491	0.751	0.0	24.4	24.4	1033.0	O K
120 min Summer	99.533	0.793	0.0	28.3	28.3	1190.9	O K
180 min Summer	99.551	0.811	0.0	30.1	30.1	1255.9	O K
240 min Summer	99.558	0.818	0.0	30.8	30.8	1283.6	O K
360 min Summer	99.561	0.821	0.0	31.1	31.1	1294.5	O K
480 min Summer	99.561	0.821	0.0	31.1	31.1	1295.2	O K
600 min Summer	99.560	0.820	0.0	31.0	31.0	1291.5	O K
720 min Summer	99.558	0.818	0.0	30.8	30.8	1284.4	O K
960 min Summer	99.553	0.813	0.0	30.3	30.3	1263.7	O K
1440 min Summer	99.538	0.798	0.0	28.8	28.8	1208.6	O K
2160 min Summer	99.516	0.776	0.0	26.5	26.5	1124.9	O K
2880 min Summer	99.496	0.756	0.0	24.7	24.7	1049.6	O K
4320 min Summer	99.463	0.723	0.0	22.0	22.0	924.8	O K
5760 min Summer	99.436	0.696	0.0	20.2	20.2	824.2	O K
7200 min Summer	99.414	0.674	0.0	19.3	19.3	743.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	82.829	0.0	558.0	28
30 min Summer	56.310	0.0	778.6	42
60 min Summer	36.710	0.0	1070.6	70
120 min Summer	21.899	0.0	1287.1	128
180 min Summer	16.008	0.0	1415.6	184
240 min Summer	12.775	0.0	1508.5	242
360 min Summer	9.267	0.0	1643.9	316
480 min Summer	7.368	0.0	1743.3	378
600 min Summer	6.165	0.0	1823.2	440
720 min Summer	5.331	0.0	1890.6	508
960 min Summer	4.241	0.0	2002.2	646
1440 min Summer	3.076	0.0	2164.6	922
2160 min Summer	2.245	0.0	2402.1	1328
2880 min Summer	1.804	0.0	2565.6	1736
4320 min Summer	1.337	0.0	2827.4	2516
5760 min Summer	1.091	0.0	3078.6	3288
7200 min Summer	0.940	0.0	3299.9	4040

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.391	0.651	0.0	18.8	18.8	680.4	O K
10080 min Summer	99.347	0.607	0.0	18.1	18.1	634.3	O K
15 min Winter	99.365	0.625	0.0	18.4	18.4	653.5	O K
30 min Winter	99.456	0.716	0.0	21.4	21.4	898.8	O K
60 min Winter	99.526	0.786	0.0	27.6	27.6	1163.8	O K
120 min Winter	99.574	0.834	0.0	32.4	32.4	1342.2	O K
180 min Winter	99.594	0.854	0.0	33.9	33.9	1417.6	O K
240 min Winter	99.603	0.863	0.0	34.5	34.5	1452.3	O K
360 min Winter	99.607	0.867	0.0	34.7	34.7	1467.1	O K
480 min Winter	99.605	0.865	0.0	34.6	34.6	1459.0	O K
600 min Winter	99.602	0.862	0.0	34.4	34.4	1450.0	O K
720 min Winter	99.598	0.858	0.0	34.2	34.2	1434.8	O K
960 min Winter	99.588	0.848	0.0	33.6	33.6	1395.3	O K
1440 min Winter	99.564	0.824	0.0	31.4	31.4	1305.6	O K
2160 min Winter	99.531	0.791	0.0	28.0	28.0	1181.4	O K
2880 min Winter	99.502	0.762	0.0	25.2	25.2	1074.7	O K
4320 min Winter	99.456	0.716	0.0	21.4	21.4	898.5	O K
5760 min Winter	99.416	0.676	0.0	19.4	19.4	751.5	O K
7200 min Winter	99.357	0.617	0.0	18.3	18.3	644.5	O K
8640 min Winter	99.285	0.545	0.0	17.1	17.1	569.2	O K
10080 min Winter	99.230	0.490	0.0	16.1	16.1	512.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	0.838	0.0	3513.2	4760
10080 min Summer	0.765	0.0	3719.9	5456
15 min Winter	82.829	0.0	632.1	28
30 min Winter	56.310	0.0	878.0	42
60 min Winter	36.710	0.0	1206.0	70
120 min Winter	21.899	0.0	1448.7	124
180 min Winter	16.008	0.0	1592.8	182
240 min Winter	12.775	0.0	1697.1	238
360 min Winter	9.267	0.0	1849.0	342
480 min Winter	7.368	0.0	1960.6	388
600 min Winter	6.165	0.0	2050.3	462
720 min Winter	5.331	0.0	2126.1	540
960 min Winter	4.241	0.0	2251.6	692
1440 min Winter	3.076	0.0	2433.4	986
2160 min Winter	2.245	0.0	2701.7	1416
2880 min Winter	1.804	0.0	2886.5	1844
4320 min Winter	1.337	0.0	3183.8	2648
5760 min Winter	1.091	0.0	3467.3	3456
7200 min Winter	0.940	0.0	3718.9	4176
8640 min Winter	0.838	0.0	3962.0	4920
10080 min Winter	0.765	0.0	4198.8	5648

Cascade Rainfall Details for V2 Permeable Paving - Lorry Park.SRCX

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.617

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.539	4	8	0.539	8	12	0.539

Time Area Diagram

Total Area (ha) 0.423

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.141	8	12	0.141	12	16	0.141

Time Area Diagram

Total Area (ha) 0.371

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.123	4	8	0.124	8	12	0.124

Time Area Diagram

Total Area (ha) 0.744

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.248	8	12	0.248	12	16	0.248

Time Area Diagram

Total Area (ha) 0.089

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.000	8	12	0.089

Time Area Diagram

Total Area (ha) 0.879

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.466	4	8	0.413

Cascade Model Details for V2 Permeable Paving - Lorry Park.SRCX

Storage is Online Cover Level (m) 100.000

Complex Structure

Cellular Storage

Invert Level (m) 98.740 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1100.0	1100.0	0.660	1100.0	1187.6

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	38.0
Membrane Percolation (mm/hr)	1000	Length (m)	238.0
Max Percolation (l/s)	2512.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	99.400	Membrane Depth (m)	0

Complex Outflow Control

Orifice

Diameter (m) 0.108 Discharge Coefficient 0.600 Invert Level (m) 98.740

Orifice

Diameter (m) 0.127 Discharge Coefficient 0.600 Invert Level (m) 99.400

Cascade Summary of Results for South Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
V2 Permeable Paving - Lorry Park.SRCX	North Wetland.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	88.583	0.183	3.9	454.0	O K
30 min Summer	88.654	0.254	4.8	637.8	O K
60 min Summer	88.730	0.330	6.2	841.4	O K
120 min Summer	88.771	0.371	9.4	951.9	O K
180 min Summer	88.788	0.388	11.2	999.1	O K
240 min Summer	88.799	0.399	12.6	1028.4	O K
360 min Summer	88.811	0.411	14.6	1061.0	O K
480 min Summer	88.818	0.418	16.0	1082.0	O K
600 min Summer	88.824	0.424	16.8	1098.4	O K
720 min Summer	88.829	0.429	17.5	1112.8	O K
960 min Summer	88.838	0.438	18.7	1136.9	O K
1440 min Summer	88.850	0.450	20.3	1170.7	O K
2160 min Summer	88.853	0.453	20.7	1178.9	O K
2880 min Summer	88.854	0.454	20.8	1181.6	O K
4320 min Summer	88.853	0.453	20.7	1180.1	O K
5760 min Summer	88.852	0.452	20.5	1175.5	O K
7200 min Summer	88.850	0.450	20.3	1171.3	O K
8640 min Summer	88.848	0.448	20.0	1163.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	82.829	0.0	292.8	759
30 min Summer	56.310	0.0	355.8	917
60 min Summer	36.710	0.0	823.5	1060
120 min Summer	21.899	0.0	998.9	1066
180 min Summer	16.008	0.0	1115.7	1056
240 min Summer	12.775	0.0	1201.2	1044
360 min Summer	9.267	0.0	1325.4	1046
480 min Summer	7.368	0.0	1413.2	1072
600 min Summer	6.165	0.0	1480.7	1114
720 min Summer	5.331	0.0	1534.7	1164
960 min Summer	4.241	0.0	1617.7	1264
1440 min Summer	3.076	0.0	1717.3	1452
2160 min Summer	2.245	0.0	2549.0	1880
2880 min Summer	1.804	0.0	2659.5	2212
4320 min Summer	1.337	0.0	2747.2	2940
5760 min Summer	1.091	0.0	3530.4	3696
7200 min Summer	0.940	0.0	3765.1	4392
8640 min Summer	0.838	0.0	3960.9	5096

Cascade Summary of Results for South Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	88.844	0.444	19.5	1154.7	O K
15 min Winter	88.607	0.207	4.2	515.4	O K
30 min Winter	88.685	0.285	5.1	721.1	O K
60 min Winter	88.758	0.358	8.1	916.6	O K
120 min Winter	88.792	0.392	11.6	1010.2	O K
180 min Winter	88.807	0.407	14.0	1049.3	O K
240 min Winter	88.815	0.415	15.4	1072.7	O K
360 min Winter	88.826	0.426	17.1	1104.6	O K
480 min Winter	88.835	0.435	18.3	1129.2	O K
600 min Winter	88.843	0.443	19.3	1150.0	O K
720 min Winter	88.850	0.450	20.3	1170.3	O K
960 min Winter	88.863	0.463	22.0	1205.7	O K
1440 min Winter	88.875	0.475	24.2	1242.0	O K
2160 min Winter	88.876	0.476	24.3	1243.3	O K
2880 min Winter	88.875	0.475	24.1	1239.6	O K
4320 min Winter	88.866	0.466	22.5	1214.0	O K
5760 min Winter	88.858	0.458	21.3	1191.5	O K
7200 min Winter	88.850	0.450	20.3	1170.4	O K
8640 min Winter	88.842	0.442	19.2	1147.3	O K
10080 min Winter	88.835	0.435	18.2	1127.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.765	0.0	4077.5	5824
15 min Winter	82.829	0.0	316.7	811
30 min Winter	56.310	0.0	380.0	984
60 min Winter	36.710	0.0	932.0	1064
120 min Winter	21.899	0.0	1155.7	1018
180 min Winter	16.008	0.0	1295.2	974
240 min Winter	12.775	0.0	1396.1	962
360 min Winter	9.267	0.0	1539.8	984
480 min Winter	7.368	0.0	1641.5	1016
600 min Winter	6.165	0.0	1720.2	1026
720 min Winter	5.331	0.0	1784.0	1038
960 min Winter	4.241	0.0	1883.1	1134
1440 min Winter	3.076	0.0	2003.2	1414
2160 min Winter	2.245	0.0	2880.2	1792
2880 min Winter	1.804	0.0	3010.5	2160
4320 min Winter	1.337	0.0	3134.6	2944
5760 min Winter	1.091	0.0	3980.2	3744
7200 min Winter	0.940	0.0	4247.3	4432
8640 min Winter	0.838	0.0	4468.3	5176
10080 min Winter	0.765	0.0	4593.2	5856

Cascade Rainfall Details for South Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.300

Time (mins) From:	To:	Area (ha)
0	4	0.300

Cascade Model Details for South Wetland.SRCX

Storage is Online Cover Level (m) 89.000

Tank or Pond Structure

Invert Level (m) 88.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2400.0	0.600	2949.3

Complex Outflow Control

Orifice

Diameter (m) 0.070 Discharge Coefficient 0.600 Invert Level (m) 88.400

Orifice

Diameter (m) 0.205 Discharge Coefficient 0.600 Invert Level (m) 88.700

Cascade Summary of Results for North Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
South Wetland.SRCX	(None)	(None)
V2 Permeable Paving - Lorry Park.SRCX		

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	83.522	0.122	5.1	67.1	O K
30 min Summer	83.559	0.159	6.9	88.7	O K
60 min Summer	83.596	0.196	8.0	111.0	O K
120 min Summer	83.616	0.216	8.5	123.1	O K
180 min Summer	83.667	0.267	9.7	155.3	O K
240 min Summer	83.710	0.310	10.6	183.0	O K
360 min Summer	83.764	0.364	12.8	219.5	O K
480 min Summer	83.786	0.386	14.6	234.7	O K
600 min Summer	83.799	0.399	16.0	243.1	O K
720 min Summer	83.807	0.407	16.8	248.7	O K
960 min Summer	83.818	0.418	18.2	257.1	O K
1440 min Summer	83.829	0.429	20.1	264.7	O K
2160 min Summer	83.836	0.436	21.4	269.9	O K
2880 min Summer	83.837	0.437	21.5	270.5	O K
4320 min Summer	83.838	0.438	21.6	270.8	O K
5760 min Summer	83.838	0.438	21.6	270.8	O K
7200 min Summer	83.838	0.438	21.6	270.7	O K
8640 min Summer	83.836	0.436	21.4	269.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	82.829	0.0	308.9	18
30 min Summer	56.310	0.0	387.6	33
60 min Summer	36.710	0.0	889.5	62
120 min Summer	21.899	0.0	1084.9	120
180 min Summer	16.008	0.0	1214.4	1350
240 min Summer	12.775	0.0	1309.0	1382
360 min Summer	9.267	0.0	1446.5	1332
480 min Summer	7.368	0.0	1543.6	1310
600 min Summer	6.165	0.0	1617.9	1308
720 min Summer	5.331	0.0	1676.5	1342
960 min Summer	4.241	0.0	1761.0	1416
1440 min Summer	3.076	0.0	1835.6	1566
2160 min Summer	2.245	0.0	2773.2	1972
2880 min Summer	1.804	0.0	2897.5	2296
4320 min Summer	1.337	0.0	3006.2	2940
5760 min Summer	1.091	0.0	3866.1	3648
7200 min Summer	0.940	0.0	4121.5	4392
8640 min Summer	0.838	0.0	4334.8	5104

Cascade Summary of Results for North Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	83.834	0.434	21.0	268.3	O K
15 min Winter	83.536	0.136	5.9	75.1	O K
30 min Winter	83.577	0.177	7.4	99.7	O K
60 min Winter	83.619	0.219	8.6	125.0	O K
120 min Winter	83.682	0.282	10.0	164.7	O K
180 min Winter	83.747	0.347	11.8	208.0	O K
240 min Winter	83.777	0.377	13.8	228.2	O K
360 min Winter	83.802	0.402	16.3	245.5	O K
480 min Winter	83.815	0.415	17.7	254.4	O K
600 min Winter	83.823	0.423	19.0	260.0	O K
720 min Winter	83.828	0.428	19.9	264.0	O K
960 min Winter	83.837	0.437	21.5	270.7	O K
1440 min Winter	83.856	0.456	24.3	283.7	O K
2160 min Winter	83.861	0.461	25.0	288.0	O K
2880 min Winter	83.861	0.461	25.0	287.7	O K
4320 min Winter	83.853	0.453	23.9	281.7	O K
5760 min Winter	83.845	0.445	22.8	276.4	O K
7200 min Winter	83.840	0.440	22.0	272.2	O K
8640 min Winter	83.833	0.433	20.8	267.7	O K
10080 min Winter	83.828	0.428	19.9	263.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.765	0.0	4459.4	5752
15 min Winter	82.829	0.0	337.8	18
30 min Winter	56.310	0.0	419.6	32
60 min Winter	36.710	0.0	1010.4	60
120 min Winter	21.899	0.0	1257.9	1324
180 min Winter	16.008	0.0	1411.8	1288
240 min Winter	12.775	0.0	1523.1	1222
360 min Winter	9.267	0.0	1681.7	1188
480 min Winter	7.368	0.0	1793.4	1182
600 min Winter	6.165	0.0	1879.0	1178
720 min Winter	5.331	0.0	1946.6	1186
960 min Winter	4.241	0.0	2044.4	1256
1440 min Winter	3.076	0.0	2133.9	1440
2160 min Winter	2.245	0.0	3135.6	1896
2880 min Winter	1.804	0.0	3282.1	2220
4320 min Winter	1.337	0.0	3430.9	2968
5760 min Winter	1.091	0.0	4357.7	3696
7200 min Winter	0.940	0.0	4648.2	4392
8640 min Winter	0.838	0.0	4888.0	5104
10080 min Winter	0.765	0.0	5024.0	5848

Cascade Rainfall Details for North Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.086

Time (mins) From:	To:	Area (ha)
0	4	0.086

Cascade Model Details for North Wetland.SRCX

Storage is Online Cover Level (m) 84.000

Tank or Pond Structure

Invert Level (m) 83.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	525.0	0.600	796.9

Complex Outflow Control

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 83.400

Orifice

Diameter (m) 0.200 Discharge Coefficient 0.600 Invert Level (m) 83.725

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Upstream Structures	Outflow To	Overflow To
(None)	South Wetland.SRCX	(None)

Half Drain Time : 528 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.436	0.696	0.0	20.2	20.2	823.3	O K
30 min Summer	99.519	0.779	0.0	26.9	26.9	1138.6	O K
60 min Summer	99.612	0.872	0.0	35.0	35.0	1484.7	O K
120 min Summer	99.658	0.918	0.0	37.5	37.5	1657.5	O K
180 min Summer	99.675	0.935	0.0	38.3	38.3	1721.6	O K
240 min Summer	99.680	0.940	0.0	38.6	38.6	1743.4	O K
360 min Summer	99.678	0.938	0.0	38.5	38.5	1733.0	O K
480 min Summer	99.672	0.932	0.0	38.2	38.2	1712.4	O K
600 min Summer	99.666	0.926	0.0	37.9	37.9	1691.2	O K
720 min Summer	99.661	0.921	0.0	37.6	37.6	1669.6	O K
960 min Summer	99.649	0.909	0.0	37.0	37.0	1625.7	O K
1440 min Summer	99.624	0.884	0.0	35.7	35.7	1532.8	O K
2160 min Summer	99.590	0.850	0.0	33.7	33.7	1404.7	O K
2880 min Summer	99.563	0.823	0.0	31.3	31.3	1302.1	O K
4320 min Summer	99.521	0.781	0.0	27.1	27.1	1144.6	O K
5760 min Summer	99.490	0.750	0.0	24.2	24.2	1026.8	O K
7200 min Summer	99.466	0.726	0.0	22.3	22.3	938.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	115.098	0.0	797.5	29
30 min Summer	79.020	0.0	1109.6	42
60 min Summer	52.064	0.0	1542.7	70
120 min Summer	30.111	0.0	1792.1	128
180 min Summer	21.647	0.0	1935.6	186
240 min Summer	17.077	0.0	2037.5	242
360 min Summer	12.194	0.0	2183.3	330
480 min Summer	9.581	0.0	2286.8	386
600 min Summer	7.946	0.0	2369.5	448
720 min Summer	6.822	0.0	2439.1	514
960 min Summer	5.374	0.0	2556.5	650
1440 min Summer	3.848	0.0	2725.9	924
2160 min Summer	2.768	0.0	2984.1	1324
2880 min Summer	2.202	0.0	3154.1	1732
4320 min Summer	1.606	0.0	3425.7	2512
5760 min Summer	1.296	0.0	3689.4	3288
7200 min Summer	1.108	0.0	3923.0	4040

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.447	0.707	0.0	20.8	20.8	864.5	O K
10080 min Summer	99.430	0.690	0.0	19.9	19.9	803.6	O K
15 min Winter	99.464	0.724	0.0	22.1	22.1	928.6	O K
30 min Winter	99.557	0.817	0.0	30.7	30.7	1281.1	O K
60 min Winter	99.661	0.921	0.0	37.6	37.6	1672.1	O K
120 min Winter	99.715	0.975	0.0	40.2	40.2	1872.1	O K
180 min Winter	99.735	0.995	0.0	41.2	41.2	1950.3	O K
240 min Winter	99.744	1.004	0.0	41.5	41.5	1980.7	O K
360 min Winter	99.743	1.003	0.0	41.5	41.5	1978.5	O K
480 min Winter	99.733	0.993	0.0	41.1	41.1	1939.6	O K
600 min Winter	99.725	0.985	0.0	40.7	40.7	1910.9	O K
720 min Winter	99.716	0.976	0.0	40.3	40.3	1878.8	O K
960 min Winter	99.698	0.958	0.0	39.5	39.5	1810.5	O K
1440 min Winter	99.660	0.920	0.0	37.6	37.6	1668.0	O K
2160 min Winter	99.610	0.870	0.0	34.9	34.9	1478.9	O K
2880 min Winter	99.571	0.831	0.0	32.1	32.1	1333.6	O K
4320 min Winter	99.516	0.776	0.0	26.5	26.5	1125.1	O K
5760 min Winter	99.474	0.734	0.0	23.1	23.1	968.6	O K
7200 min Winter	99.441	0.701	0.0	20.5	20.5	844.6	O K
8640 min Winter	99.412	0.672	0.0	19.2	19.2	733.4	O K
10080 min Winter	99.365	0.625	0.0	18.4	18.4	653.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	0.981	0.0	4151.4	4768
10080 min Summer	0.891	0.0	4376.6	5552
15 min Winter	115.098	0.0	899.1	29
30 min Winter	79.020	0.0	1245.1	41
60 min Winter	52.064	0.0	1734.8	70
120 min Winter	30.111	0.0	2014.2	126
180 min Winter	21.647	0.0	2175.0	182
240 min Winter	17.077	0.0	2289.3	238
360 min Winter	12.194	0.0	2452.7	346
480 min Winter	9.581	0.0	2568.8	406
600 min Winter	7.946	0.0	2661.6	472
720 min Winter	6.822	0.0	2739.7	548
960 min Winter	5.374	0.0	2871.1	700
1440 min Winter	3.848	0.0	3058.9	996
2160 min Winter	2.768	0.0	3353.6	1412
2880 min Winter	2.202	0.0	3545.7	1820
4320 min Winter	1.606	0.0	3853.4	2640
5760 min Winter	1.296	0.0	4151.3	3456
7200 min Winter	1.108	0.0	4416.6	4248
8640 min Winter	0.981	0.0	4676.4	4944
10080 min Winter	0.891	0.0	4934.1	5656

Cascade Rainfall Details for V2 Permeable Paving - Lorry Park.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.617

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.539	4	8	0.539	8	12	0.539

Time Area Diagram

Total Area (ha) 0.423

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.141	8	12	0.141	12	16	0.141

Time Area Diagram

Total Area (ha) 0.371

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.123	4	8	0.124	8	12	0.124

Time Area Diagram

Total Area (ha) 0.744

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.248	8	12	0.248	12	16	0.248

Time Area Diagram

Total Area (ha) 0.089

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.000	8	12	0.089

Time Area Diagram

Total Area (ha) 0.879

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.466	4	8	0.413

Cascade Model Details for V2 Permeable Paving - Lorry Park.SRCX

Storage is Online Cover Level (m) 100.000

Complex Structure

Cellular Storage

Invert Level (m) 98.740 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1100.0	1100.0	0.660	1100.0	1187.6

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	38.0
Membrane Percolation (mm/hr)	1000	Length (m)	238.0
Max Percolation (l/s)	2512.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	99.400	Membrane Depth (m)	0

Complex Outflow Control

Orifice

Diameter (m) 0.108 Discharge Coefficient 0.600 Invert Level (m) 98.740

Orifice

Diameter (m) 0.127 Discharge Coefficient 0.600 Invert Level (m) 99.400

Cascade Summary of Results for South Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
V2 Permeable Paving - Lorry Park.SRCX	North Wetland.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	88.660	0.260	4.8	653.2	O K
30 min Summer	88.749	0.349	7.4	892.4	O K
60 min Summer	88.802	0.402	13.2	1036.9	O K
120 min Summer	88.822	0.422	16.6	1092.1	O K
180 min Summer	88.833	0.433	18.0	1123.6	O K
240 min Summer	88.842	0.442	19.2	1147.3	O K
360 min Summer	88.856	0.456	21.1	1187.4	O K
480 min Summer	88.867	0.467	22.7	1217.1	O K
600 min Summer	88.874	0.474	24.0	1238.8	O K
720 min Summer	88.881	0.481	25.2	1257.2	O K
960 min Summer	88.891	0.491	27.1	1287.2	O K
1440 min Summer	88.899	0.499	28.4	1308.2	O K
2160 min Summer	88.897	0.497	28.1	1303.6	O K
2880 min Summer	88.895	0.495	27.8	1298.2	O K
4320 min Summer	88.888	0.488	26.5	1278.9	O K
5760 min Summer	88.881	0.481	25.3	1258.1	O K
7200 min Summer	88.873	0.473	23.8	1236.5	O K
8640 min Summer	88.868	0.468	22.9	1220.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	115.098	0.0	362.5	922
30 min Summer	79.020	0.0	478.7	1056
60 min Summer	52.064	0.0	1258.0	940
120 min Summer	30.111	0.0	1509.7	876
180 min Summer	21.647	0.0	1652.6	878
240 min Summer	17.077	0.0	1752.4	860
360 min Summer	12.194	0.0	1891.2	842
480 min Summer	9.581	0.0	1985.7	882
600 min Summer	7.946	0.0	2057.9	926
720 min Summer	6.822	0.0	2116.3	968
960 min Summer	5.374	0.0	2209.4	1082
1440 min Summer	3.848	0.0	2318.1	1376
2160 min Summer	2.768	0.0	3196.9	1696
2880 min Summer	2.202	0.0	3309.0	2048
4320 min Summer	1.606	0.0	3400.1	2796
5760 min Summer	1.296	0.0	4236.3	3536
7200 min Summer	1.108	0.0	4481.0	4304
8640 min Summer	0.981	0.0	4682.9	5032

Cascade Summary of Results for South Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	88.864	0.464	22.1	1208.4	O K
15 min Winter	88.692	0.292	5.2	738.3	O K
30 min Winter	88.773	0.373	9.6	957.8	O K
60 min Winter	88.818	0.418	15.9	1080.2	O K
120 min Winter	88.840	0.440	18.9	1141.4	O K
180 min Winter	88.855	0.455	21.0	1184.7	O K
240 min Winter	88.867	0.467	22.7	1217.5	O K
360 min Winter	88.882	0.482	25.4	1259.5	O K
480 min Winter	88.892	0.492	27.1	1288.3	O K
600 min Winter	88.900	0.500	28.6	1310.6	O K
720 min Winter	88.906	0.506	29.7	1328.8	O K
960 min Winter	88.916	0.516	31.5	1357.6	O K
1440 min Winter	88.926	0.526	33.4	1386.3	O K
2160 min Winter	88.923	0.523	32.9	1377.8	O K
2880 min Winter	88.917	0.517	31.8	1361.7	O K
4320 min Winter	88.899	0.499	28.4	1308.7	O K
5760 min Winter	88.883	0.483	25.5	1263.1	O K
7200 min Winter	88.870	0.470	23.2	1226.6	O K
8640 min Winter	88.862	0.462	21.9	1205.0	O K
10080 min Winter	88.855	0.455	21.0	1184.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.891	0.0	4792.9	5776
15 min Winter	115.098	0.0	387.0	989
30 min Winter	79.020	0.0	583.5	1018
60 min Winter	52.064	0.0	1456.9	866
120 min Winter	30.111	0.0	1742.3	830
180 min Winter	21.647	0.0	1904.5	762
240 min Winter	17.077	0.0	2018.0	770
360 min Winter	12.194	0.0	2176.7	796
480 min Winter	9.581	0.0	2285.4	850
600 min Winter	7.946	0.0	2369.0	906
720 min Winter	6.822	0.0	2437.1	964
960 min Winter	5.374	0.0	2546.4	1086
1440 min Winter	3.848	0.0	2675.0	1380
2160 min Winter	2.768	0.0	3609.4	1696
2880 min Winter	2.202	0.0	3741.8	2076
4320 min Winter	1.606	0.0	3866.9	2856
5760 min Winter	1.296	0.0	4770.9	3632
7200 min Winter	1.108	0.0	5050.7	4400
8640 min Winter	0.981	0.0	5281.0	5184
10080 min Winter	0.891	0.0	5403.9	5880

Cascade Rainfall Details for South Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.300

Time (mins) From:	To:	Area (ha)
0	4	0.300

Cascade Model Details for South Wetland.SRCX

Storage is Online Cover Level (m) 89.000

Tank or Pond Structure

Invert Level (m) 88.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2400.0	0.600	2949.3

Complex Outflow Control

Orifice

Diameter (m) 0.070 Discharge Coefficient 0.600 Invert Level (m) 88.400

Orifice

Diameter (m) 0.205 Discharge Coefficient 0.600 Invert Level (m) 88.700

Cascade Summary of Results for North Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
South Wetland.SRCX	(None)	(None)
V2 Permeable Paving - Lorry Park.SRCX		

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	83.566	0.166	7.1	93.0	O K
30 min Summer	83.619	0.219	8.6	125.3	O K
60 min Summer	83.726	0.326	11.0	193.6	O K
120 min Summer	83.794	0.394	15.5	240.0	O K
180 min Summer	83.812	0.412	17.4	252.4	O K
240 min Summer	83.822	0.422	18.8	259.4	O K
360 min Summer	83.832	0.432	20.7	267.1	O K
480 min Summer	83.841	0.441	22.2	273.2	O K
600 min Summer	83.850	0.450	23.5	279.7	O K
720 min Summer	83.858	0.458	24.6	285.6	O K
960 min Summer	83.871	0.471	26.4	295.4	O K
1440 min Summer	83.890	0.490	29.2	308.9	O K
2160 min Summer	83.888	0.488	28.9	307.9	O K
2880 min Summer	83.887	0.487	28.6	306.8	O K
4320 min Summer	83.881	0.481	27.8	302.5	O K
5760 min Summer	83.874	0.474	26.7	297.0	O K
7200 min Summer	83.865	0.465	25.5	290.5	O K
8640 min Summer	83.858	0.458	24.6	285.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	115.098	0.0	395.7	18
30 min Summer	79.020	0.0	526.8	33
60 min Summer	52.064	0.0	1369.9	1286
120 min Summer	30.111	0.0	1646.9	1090
180 min Summer	21.647	0.0	1804.2	1054
240 min Summer	17.077	0.0	1913.9	1010
360 min Summer	12.194	0.0	2066.1	984
480 min Summer	9.581	0.0	2168.3	984
600 min Summer	7.946	0.0	2244.3	1032
720 min Summer	6.822	0.0	2303.3	1078
960 min Summer	5.374	0.0	2390.7	1186
1440 min Summer	3.848	0.0	2464.7	1440
2160 min Summer	2.768	0.0	3482.1	1784
2880 min Summer	2.202	0.0	3608.9	2132
4320 min Summer	1.606	0.0	3721.8	2852
5760 min Summer	1.296	0.0	4637.5	3576
7200 min Summer	1.108	0.0	4903.4	4320
8640 min Summer	0.981	0.0	5122.1	5096

Cascade Summary of Results for North Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	83.853	0.453	23.9	281.6	O K
15 min Winter	83.585	0.185	7.7	104.4	O K
30 min Winter	83.644	0.244	9.2	140.8	O K
60 min Winter	83.784	0.384	14.4	233.3	O K
120 min Winter	83.820	0.420	18.4	258.0	O K
180 min Winter	83.832	0.432	20.6	266.5	O K
240 min Winter	83.841	0.441	22.2	273.3	O K
360 min Winter	83.859	0.459	24.7	286.2	O K
480 min Winter	83.872	0.472	26.5	295.5	O K
600 min Winter	83.882	0.482	27.8	302.9	O K
720 min Winter	83.889	0.489	29.1	308.5	O K
960 min Winter	83.901	0.501	31.2	316.9	O K
1440 min Winter	83.918	0.518	34.3	330.2	O K
2160 min Winter	83.917	0.517	34.1	329.2	O K
2880 min Winter	83.913	0.513	33.4	326.6	O K
4320 min Winter	83.897	0.497	30.4	314.0	O K
5760 min Winter	83.880	0.480	27.6	301.4	O K
7200 min Winter	83.863	0.463	25.2	288.9	O K
8640 min Winter	83.853	0.453	23.9	281.6	O K
10080 min Winter	83.845	0.445	22.8	276.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.891	0.0	5242.8	5760
15 min Winter	115.098	0.0	428.2	18
30 min Winter	79.020	0.0	614.8	32
60 min Winter	52.064	0.0	1588.5	1110
120 min Winter	30.111	0.0	1902.2	972
180 min Winter	21.647	0.0	2080.2	906
240 min Winter	17.077	0.0	2204.4	864
360 min Winter	12.194	0.0	2376.7	908
480 min Winter	9.581	0.0	2492.0	954
600 min Winter	7.946	0.0	2578.1	1006
720 min Winter	6.822	0.0	2645.4	1052
960 min Winter	5.374	0.0	2745.8	1164
1440 min Winter	3.848	0.0	2840.1	1400
2160 min Winter	2.768	0.0	3933.5	1756
2880 min Winter	2.202	0.0	4082.9	2108
4320 min Winter	1.606	0.0	4232.9	2856
5760 min Winter	1.296	0.0	5221.8	3640
7200 min Winter	1.108	0.0	5526.0	4392
8640 min Winter	0.981	0.0	5774.6	5104
10080 min Winter	0.891	0.0	5911.8	5848

Cascade Rainfall Details for North Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.086

Time (mins) From:	To:	Area (ha)
0	4	0.086

Cascade Model Details for North Wetland.SRCX

Storage is Online Cover Level (m) 84.000

Tank or Pond Structure

Invert Level (m) 83.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	525.0	0.600	796.9

Complex Outflow Control

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 83.400

Orifice

Diameter (m) 0.200 Discharge Coefficient 0.600 Invert Level (m) 83.725

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Upstream Structures	Outflow To	Overflow To
(None)	South Wetland.SRCX	(None)

Half Drain Time : 583 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.529	0.789	0.0	27.8	27.8	1172.7	O K
30 min Summer	99.646	0.906	0.0	36.8	36.8	1613.3	O K
60 min Summer	99.777	1.037	0.0	43.0	43.0	2105.9	O K
120 min Summer	99.845	1.105	0.0	45.7	45.7	2360.3	O K
180 min Summer	99.872	1.132	0.0	46.8	46.8	2462.6	O K
240 min Summer	99.883	1.143	0.0	47.2	47.2	2505.4	O K
360 min Summer	99.884	1.144	0.0	47.3	47.3	2509.3	O K
480 min Summer	99.876	1.136	0.0	46.9	46.9	2477.5	O K
600 min Summer	99.868	1.128	0.0	46.6	46.6	2448.2	O K
720 min Summer	99.860	1.120	0.0	46.3	46.3	2419.2	O K
960 min Summer	99.845	1.105	0.0	45.8	45.8	2363.4	O K
1440 min Summer	99.813	1.073	0.0	44.5	44.5	2241.6	O K
2160 min Summer	99.766	1.026	0.0	42.5	42.5	2065.2	O K
2880 min Summer	99.725	0.985	0.0	40.7	40.7	1910.6	O K
4320 min Summer	99.660	0.920	0.0	37.6	37.6	1665.7	O K
5760 min Summer	99.614	0.874	0.0	35.1	35.1	1492.6	O K
7200 min Summer	99.582	0.842	0.0	33.2	33.2	1373.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	161.137	0.0	1133.0	29
30 min Summer	110.628	0.0	1555.5	42
60 min Summer	72.889	0.0	2183.0	70
120 min Summer	42.156	0.0	2532.3	128
180 min Summer	30.305	0.0	2733.3	186
240 min Summer	23.908	0.0	2876.1	244
360 min Summer	17.071	0.0	3080.5	360
480 min Summer	13.414	0.0	3225.7	412
600 min Summer	11.125	0.0	3341.4	472
720 min Summer	9.551	0.0	3438.7	532
960 min Summer	7.524	0.0	3601.3	666
1440 min Summer	5.387	0.0	3821.6	940
2160 min Summer	3.876	0.0	4215.4	1348
2880 min Summer	3.082	0.0	4459.2	1740
4320 min Summer	2.249	0.0	4851.0	2512
5760 min Summer	1.815	0.0	5228.7	3280
7200 min Summer	1.551	0.0	5567.3	3976

Cascade Summary of Results for V2 Permeable Paving - Lorry Park.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.560	0.820	0.0	31.0	31.0	1292.7	O K
10080 min Summer	99.543	0.803	0.0	29.3	29.3	1228.1	O K
15 min Winter	99.567	0.827	0.0	31.7	31.7	1319.1	O K
30 min Winter	99.699	0.959	0.0	39.5	39.5	1814.7	O K
60 min Winter	99.847	1.107	0.0	45.8	45.8	2370.6	O K
120 min Winter	99.925	1.185	0.0	48.8	48.8	2663.4	O K
180 min Winter	99.958	1.218	0.0	49.9	49.9	2785.6	O K
240 min Winter	99.973	1.233	0.0	50.5	50.5	2841.4	O K
360 min Winter	99.978	1.238	0.0	50.6	50.6	2862.0	O K
480 min Winter	99.968	1.228	0.0	50.3	50.3	2823.7	O K
600 min Winter	99.954	1.214	0.0	49.8	49.8	2772.4	O K
720 min Winter	99.944	1.204	0.0	49.4	49.4	2733.4	O K
960 min Winter	99.922	1.182	0.0	48.6	48.6	2649.9	O K
1440 min Winter	99.872	1.132	0.0	46.8	46.8	2465.0	O K
2160 min Winter	99.802	1.062	0.0	44.0	44.0	2201.9	O K
2880 min Winter	99.743	1.003	0.0	41.5	41.5	1978.2	O K
4320 min Winter	99.652	0.912	0.0	37.2	37.2	1638.0	O K
5760 min Winter	99.592	0.852	0.0	33.8	33.8	1412.5	O K
7200 min Winter	99.555	0.815	0.0	30.5	30.5	1273.6	O K
8640 min Winter	99.528	0.788	0.0	27.8	27.8	1171.7	O K
10080 min Winter	99.506	0.766	0.0	25.6	25.6	1089.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	1.374	0.0	5898.9	4760
10080 min Summer	1.248	0.0	6227.5	5456
15 min Winter	161.137	0.0	1271.2	29
30 min Winter	110.628	0.0	1733.9	42
60 min Winter	72.889	0.0	2451.8	70
120 min Winter	42.156	0.0	2842.8	126
180 min Winter	30.305	0.0	3067.9	182
240 min Winter	23.908	0.0	3227.8	240
360 min Winter	17.071	0.0	3456.5	350
480 min Winter	13.414	0.0	3618.8	456
600 min Winter	11.125	0.0	3748.0	492
720 min Winter	9.551	0.0	3856.4	564
960 min Winter	7.524	0.0	4034.9	716
1440 min Winter	5.387	0.0	4265.4	1016
2160 min Winter	3.876	0.0	4732.6	1448
2880 min Winter	3.082	0.0	5007.5	1852
4320 min Winter	2.249	0.0	5449.1	2640
5760 min Winter	1.815	0.0	5875.2	3400
7200 min Winter	1.551	0.0	6258.1	4176
8640 min Winter	1.374	0.0	6633.6	4928
10080 min Winter	1.248	0.0	7007.2	5664

Cascade Rainfall Details for V2 Permeable Paving - Lorry Park.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.617

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.539	4	8	0.539	8	12	0.539

Time Area Diagram

Total Area (ha) 0.423

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.141	8	12	0.141	12	16	0.141

Time Area Diagram

Total Area (ha) 0.371

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.123	4	8	0.124	8	12	0.124

Time Area Diagram

Total Area (ha) 0.744

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.248	8	12	0.248	12	16	0.248

Time Area Diagram

Total Area (ha) 0.089

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.000	8	12	0.089

Time Area Diagram

Total Area (ha) 0.879

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.466	4	8	0.413

Cascade Model Details for V2 Permeable Paving - Lorry Park.SRCX

Storage is Online Cover Level (m) 100.000

Complex Structure

Cellular Storage

Invert Level (m) 98.740 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1100.0	1100.0	0.660	1100.0	1187.6

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	38.0
Membrane Percolation (mm/hr)	1000	Length (m)	238.0
Max Percolation (l/s)	2512.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	99.400	Membrane Depth (m)	0

Complex Outflow Control

Orifice

Diameter (m) 0.108 Discharge Coefficient 0.600 Invert Level (m) 98.740

Orifice

Diameter (m) 0.127 Discharge Coefficient 0.600 Invert Level (m) 99.400

Cascade Summary of Results for South Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
V2 Permeable Paving - Lorry Park.SRCX	North Wetland.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	88.754	0.354	7.8	904.4	O K
30 min Summer	88.811	0.411	14.6	1060.5	O K
60 min Summer	88.856	0.456	21.0	1186.6	O K
120 min Summer	88.888	0.488	26.5	1278.9	O K
180 min Summer	88.905	0.505	29.5	1325.3	O K
240 min Summer	88.915	0.515	31.4	1354.4	O K
360 min Summer	88.928	0.528	33.8	1391.2	O K
480 min Summer	88.936	0.536	35.3	1416.2	O K
600 min Summer	88.943	0.543	36.6	1435.9	O K
720 min Summer	88.949	0.549	37.8	1452.8	O K
960 min Summer	88.959	0.559	39.5	1481.8	O K
1440 min Summer	88.967	0.567	41.1	1506.6	O K
2160 min Summer	88.967	0.567	41.0	1504.9	O K
2880 min Summer	88.966	0.566	41.0	1502.5	O K
4320 min Summer	88.960	0.560	39.7	1484.5	O K
5760 min Summer	88.951	0.551	38.0	1457.7	O K
7200 min Summer	88.941	0.541	36.2	1429.4	O K
8640 min Summer	88.930	0.530	34.2	1398.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	161.137	0.0	497.3	1050
30 min Summer	110.628	0.0	866.4	883
60 min Summer	72.889	0.0	1927.0	706
120 min Summer	42.156	0.0	2290.3	686
180 min Summer	30.305	0.0	2497.4	714
240 min Summer	23.908	0.0	2642.9	752
360 min Summer	17.071	0.0	2847.5	818
480 min Summer	13.414	0.0	2988.9	868
600 min Summer	11.125	0.0	3098.7	918
720 min Summer	9.551	0.0	3187.9	966
960 min Summer	7.524	0.0	3329.5	1068
1440 min Summer	5.387	0.0	3488.3	1378
2160 min Summer	3.876	0.0	4572.8	1680
2880 min Summer	3.082	0.0	4760.3	2008
4320 min Summer	2.249	0.0	4975.0	2724
5760 min Summer	1.815	0.0	6017.0	3464
7200 min Summer	1.551	0.0	6375.7	4192
8640 min Summer	1.374	0.0	6669.5	4936

Cascade Summary of Results for South Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	88.922	0.522	32.7	1373.7	O K
15 min Winter	88.777	0.377	10.0	968.0	O K
30 min Winter	88.826	0.426	17.1	1103.7	O K
60 min Winter	88.881	0.481	25.3	1258.6	O K
120 min Winter	88.913	0.513	31.0	1347.6	O K
180 min Winter	88.927	0.527	33.6	1388.5	O K
240 min Winter	88.936	0.536	35.3	1414.9	O K
360 min Winter	88.948	0.548	37.6	1451.2	O K
480 min Winter	88.957	0.557	39.3	1476.7	O K
600 min Winter	88.964	0.564	40.6	1497.7	O K
720 min Winter	88.971	0.571	41.8	1515.9	O K
960 min Winter	88.982	0.582	43.9	1548.5	O K
1440 min Winter	88.992	0.592	45.8	1578.7	O K
2160 min Winter	88.990	0.590	45.4	1572.7	O K
2880 min Winter	88.985	0.585	44.5	1558.9	O K
4320 min Winter	88.968	0.568	41.3	1508.2	O K
5760 min Winter	88.950	0.550	38.0	1456.1	O K
7200 min Winter	88.931	0.531	34.4	1401.9	O K
8640 min Winter	88.916	0.516	31.5	1357.5	O K
10080 min Winter	88.904	0.504	29.3	1322.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.248	0.0	6836.6	5664
15 min Winter	161.137	0.0	607.8	999
30 min Winter	110.628	0.0	1043.6	826
60 min Winter	72.889	0.0	2211.7	662
120 min Winter	42.156	0.0	2621.6	694
180 min Winter	30.305	0.0	2855.7	738
240 min Winter	23.908	0.0	3020.3	764
360 min Winter	17.071	0.0	3252.4	810
480 min Winter	13.414	0.0	3413.1	856
600 min Winter	11.125	0.0	3537.3	904
720 min Winter	9.551	0.0	3638.0	948
960 min Winter	7.524	0.0	3796.0	1040
1440 min Winter	5.387	0.0	3965.9	1360
2160 min Winter	3.876	0.0	5150.8	1664
2880 min Winter	3.082	0.0	5373.2	2044
4320 min Winter	2.249	0.0	5638.1	2808
5760 min Winter	1.815	0.0	6765.0	3576
7200 min Winter	1.551	0.0	7174.7	4328
8640 min Winter	1.374	0.0	7518.0	5104
10080 min Winter	1.248	0.0	7728.9	5856

Cascade Rainfall Details for South Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.300

Time (mins) From:	To:	Area (ha)
0	4	0.300

Cascade Model Details for South Wetland.SRCX

Storage is Online Cover Level (m) 89.000

Tank or Pond Structure

Invert Level (m) 88.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2400.0	0.600	2949.3

Complex Outflow Control

Orifice

Diameter (m) 0.070 Discharge Coefficient 0.600 Invert Level (m) 88.400

Orifice

Diameter (m) 0.205 Discharge Coefficient 0.600 Invert Level (m) 88.700

Cascade Summary of Results for North Wetland.SRCX

Upstream Structures	Outflow To	Overflow To
South Wetland.SRCX	(None)	(None)
V2 Permeable Paving - Lorry Park.SRCX		

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	83.628	0.228	8.8	130.7	O K
30 min Summer	83.764	0.364	12.7	219.0	O K
60 min Summer	83.832	0.432	20.7	266.8	O K
120 min Summer	83.867	0.467	25.9	292.3	O K
180 min Summer	83.888	0.488	28.8	307.4	O K
240 min Summer	83.899	0.499	30.8	315.7	O K
360 min Summer	83.913	0.513	33.3	326.2	O K
480 min Summer	83.922	0.522	35.1	333.1	O K
600 min Summer	83.929	0.529	36.3	338.4	O K
720 min Summer	83.935	0.535	37.4	342.9	O K
960 min Summer	83.945	0.545	39.4	351.0	O K
1440 min Summer	83.963	0.563	42.7	364.6	O K
2160 min Summer	83.963	0.563	42.6	364.5	O K
2880 min Summer	83.963	0.563	42.7	365.0	O K
4320 min Summer	83.961	0.561	42.2	362.7	O K
5760 min Summer	83.953	0.553	40.8	356.6	O K
7200 min Summer	83.943	0.543	39.0	349.2	O K
8640 min Summer	83.932	0.532	36.9	341.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	161.137	0.0	543.7	18
30 min Summer	110.628	0.0	847.5	1174
60 min Summer	72.889	0.0	2104.3	840
120 min Summer	42.156	0.0	2501.7	794
180 min Summer	30.305	0.0	2726.6	808
240 min Summer	23.908	0.0	2882.8	832
360 min Summer	17.071	0.0	3098.6	892
480 min Summer	13.414	0.0	3243.8	946
600 min Summer	11.125	0.0	3352.7	994
720 min Summer	9.551	0.0	3438.3	1040
960 min Summer	7.524	0.0	3567.9	1140
1440 min Summer	5.387	0.0	3705.8	1428
2160 min Summer	3.876	0.0	4987.9	1728
2880 min Summer	3.082	0.0	5198.3	2028
4320 min Summer	2.249	0.0	5443.4	2720
5760 min Summer	1.815	0.0	6583.6	3464
7200 min Summer	1.551	0.0	6974.0	4184
8640 min Summer	1.374	0.0	7290.0	4936

Cascade Summary of Results for North Wetland.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	83.924	0.524	35.3	334.3	O K
15 min Winter	83.654	0.254	9.4	146.7	O K
30 min Winter	83.801	0.401	16.2	245.1	O K
60 min Winter	83.858	0.458	24.6	285.8	O K
120 min Winter	83.896	0.496	30.4	313.8	O K
180 min Winter	83.912	0.512	33.2	325.4	O K
240 min Winter	83.922	0.522	35.0	332.7	O K
360 min Winter	83.934	0.534	37.3	342.3	O K
480 min Winter	83.943	0.543	39.0	349.2	O K
600 min Winter	83.950	0.550	40.3	354.8	O K
720 min Winter	83.957	0.557	41.5	359.7	O K
960 min Winter	83.969	0.569	43.7	369.0	O K
1440 min Winter	83.990	0.590	47.7	385.5	O K
2160 min Winter	83.990	0.590	47.7	385.4	O K
2880 min Winter	83.988	0.588	47.4	384.4	O K
4320 min Winter	83.973	0.573	44.5	372.2	O K
5760 min Winter	83.954	0.554	41.0	357.9	O K
7200 min Winter	83.935	0.535	37.4	342.8	O K
8640 min Winter	83.918	0.518	34.3	330.3	O K
10080 min Winter	83.905	0.505	32.0	320.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.248	0.0	7481.1	5656
15 min Winter	161.137	0.0	635.7	18
30 min Winter	110.628	0.0	1031.9	1028
60 min Winter	72.889	0.0	2415.9	776
120 min Winter	42.156	0.0	2862.0	778
180 min Winter	30.305	0.0	3113.3	810
240 min Winter	23.908	0.0	3288.0	840
360 min Winter	17.071	0.0	3530.0	882
480 min Winter	13.414	0.0	3692.7	934
600 min Winter	11.125	0.0	3815.1	986
720 min Winter	9.551	0.0	3911.8	1026
960 min Winter	7.524	0.0	4060.2	1094
1440 min Winter	5.387	0.0	4220.3	1370
2160 min Winter	3.876	0.0	5620.6	1664
2880 min Winter	3.082	0.0	5869.3	2020
4320 min Winter	2.249	0.0	6164.2	2808
5760 min Winter	1.815	0.0	7401.1	3576
7200 min Winter	1.551	0.0	7847.4	4320
8640 min Winter	1.374	0.0	8217.3	5096
10080 min Winter	1.248	0.0	8457.0	5848

Cascade Rainfall Details for North Wetland.SRCX

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 328669 338322 SJ 28669 38322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.360

Time (mins) From:	To:	Area (ha)
0	4	0.360

Time Area Diagram

Total Area (ha) 0.086

Time (mins) From:	To:	Area (ha)
0	4	0.086

Cascade Model Details for North Wetland.SRCX

Storage is Online Cover Level (m) 84.000

Tank or Pond Structure

Invert Level (m) 83.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	525.0	0.600	796.9

Complex Outflow Control

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 83.400

Orifice

Diameter (m) 0.200 Discharge Coefficient 0.600 Invert Level (m) 83.725

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