



AUGUST 2026

Flood Risk Assessment and Sustainable Drainage Strategy

Uxbridge College, Park Road, Uxbridge, UB8 1NQ

Iceni Projects Limited on behalf of
Harrow, Richmond and Uxbridge Colleges (HRUC)

August 2026

Iceni Projects

Birmingham: The Colmore Building, 20 Colmore Circus Queensway, Birmingham B4 6AT
Edinburgh: 14 – 18 Hill Street, Edinburgh, EH2 3JZ
Glasgow: 201 West George Street, Glasgow, G2 2LW
London: Da Vinci House, 44 Saffron Hill, London, EC1N 8FH
Manchester: WeWork, Dalton Place, 29 John Dalton Street, Manchester, M2 6FW

t: 020 3640 8508 | w: [iceniprojects.com](https://www.iceniprojects.com) | e: mail@iceniprojects.com
linkedin: [linkedin.com/company/iceni-projects](https://www.linkedin.com/company/iceni-projects) | twitter: [@iceniprojects](https://twitter.com/iceniprojects)

ICENI PROJECTS LIMITED
ON BEHALF OF
HARROW, RICHMOND AND
UXBRIDGE COLLEGES
(HRUC)

**Flood Risk Assessment and
Sustainable Drainage Strategy**
ERROR! NO TEXT OF SPECIFIED STYLE IN
DOCUMENT.

CONTENTS

1. EXECUTIVE SUMMARY	1
2. INTRODUCTION	3
3. PLANNING POLICY FRAMEWORK	5
4. SITE GEOLOGY	16
5. DEVELOPMENT SITE FLOOD ZONE	19
6. SITE VULNERABILITY	20
7. FLOOD RISK ASSESSMENT	23
8. SUSTAINABLE DRAINAGE SYSTEMS	33
9. CONCLUSION	38

APPENDICES

- A1. SITE BOUNDARY AND AREA OF DEVELOPMENT
 - A2. SURFACE WATER RUNOFF CALCULATIONS – PRE-DEVELOPMENT
 - A3. SURFACE WATER RUNOFF CALCULATIONS – GREENFIELD
 - A4. SURFACE WATER RUNOFF CALCULATIONS – POST-DEVELOPMENT
 - A5. GENERAL NOTES
-

1. EXECUTIVE SUMMARY

- 1.1 Icen Projects Ltd has been commissioned by Harrow, Richmond and Uxbridge Colleges (HRUC; the 'Applicant') to produce a Flood Risk Assessment and Sustainable Drainage Strategy to accompany the planning application for the Proposed Development at Uxbridge College, Park Road, Uxbridge, UB8 1NQ (the 'Site').
- 1.2 This report is split into two main sections, the first analyses flood risk associated with the Site arising from both natural and artificial sources. The second presents an outline surface water drainage assessment, detailing the proposed Sustainable Drainage System (SuDS) strategy best suited to the Site.

Flood Risk

- 1.3 From the preliminary Flood Risk Assessment, the Site has been identified as being located entirely within Flood Zone 1. This suggests that there is a less than 1 in 1,000 chance of river or tidal flooding on an annual basis. In addition to this, the assessment indicates that the risk of flooding from groundwater, sewer or reservoir sources at the Site is very low.
- 1.4 With respect to surface water flooding, it is demonstrated that the vast majority of the Site is at very low risk of flooding from this source. There are areas to the east and west of the Site, within the wider Uxbridge College campus, that are shown to be a low to high risk of flooding from this source. In particular, there is a pond / surface water feature located to the west of the Site, as well an area to the east of the Site, and which is located to the west of the existing West London Institute of Technology building, demonstrated to be at low to high risk of flooding from this source both in the present day and under the future climate change scenario. It is anticipated, however, that this risk will not encroach into the boundaries of the Site, which is shown to remain at very low risk of flooding from this source both in the present day, and under the future climate change scenario.
- 1.5 Furthermore, the Proposed Development will result only in a minor increase to the hardstanding area of the Site, seeking to largely mirror the footprint of the existing single-storey building. It is expected that the existing Site-specific characteristics, including the local topography, will ensure that, during periods of heavy rainfall, runoff will continue be channelled from the Site as per the existing case. Therefore, there will be no exacerbation of the risk of flooding from surface water sources either on the Site or in the immediate surroundings as a result of the Proposed Development.
- 1.6 From the information presented within this report, it can be concluded that the flood risk associated with the Site is minimal, and that the Proposed Development will be designed to eliminate any risk to people or property throughout the duration of its lifespan.

Surface Water Drainage

- 1.7 The surface water drainage strategy aims to demonstrate that the Proposed Development's influence on surface water has been sufficiently addressed through the application of appropriate Sustainable Drainage Systems (SuDS). The assessment of the surface water management strategy demonstrates that the Proposed Development does not increase the flood risk on the Site, nor elsewhere within the catchment.
- 1.8 This report has been written to comply with the strategy laid out within the non-statutory Technical Standards for Sustainable Drainage: Practical Guidance, the London Borough of Hillingdon Local Plan: Part 1 – Strategic Policies (2012), and the London Borough of Hillingdon Local Plan: Part 2 – Development Management Policies (2020).
- 1.9 In consideration of the nature of the Proposed Development, which seeks to replace the existing single-storey building with a three-storey building within largely the same footprint, and which will operate for a temporary period of only five years, opportunities to incorporate sustainable drainage features are limited. As the Proposed Development will not result in a significant increase in the footprint of the built-form at the Site, and only a minor increase in the area of hardstanding, it is considered that the Proposed Development will result in no additional burden on the existing drainage network. The risk of surface water flooding identified at the Site will remain low, as per the existing case, and the retaining of large areas of the existing landscaping at the Site will positively contribute to the management of the 5mm storm event runoff, and reduce runoff volume through the facilitation of interception and evapotranspiration.
- 1.10 Overall, there will be no increase in surface water runoff as a result of the Proposed Development, which will not result in a significant increase in the footprint of the built-form at the Site, and only a minor increase in the area of hardstanding, compared to the existing case. The delivery of the proposed Landscape Strategy, which will seek to retain large areas of the existing soft landscaping and vegetation at the Site, will aid the management of runoff arising from the 'everyday' storm. It is expected that, with only a minor increase to the hardstanding area of the Site and through the maintenance of soft landscaping, the Proposed Development will result in no change to the volume of surface water generated on the Site, nor the rate at which it is discharged. It is anticipated that the rate at which surface water runoff leaves the Site will remain as per the existing case in the post-development context. This will therefore mitigate potential any increase of the risk of surface water flooding both on the Site, and in the surrounding area, and therefore also mitigating the potential for an increased burden on the existing drainage network.

2. INTRODUCTION

- 2.1 Icen Projects Ltd has been commissioned by Harrow, Richmond and Uxbridge Colleges (HRUC; the 'Applicant') to produce a Flood Risk Assessment and Sustainable Drainage Strategy to accompany the planning application for the Proposed Development at Uxbridge College, Park Road, Uxbridge, UB8 1NQ (the 'Site').

Report Objectives

- 2.2 The purpose of this report is to demonstrate that any potential sources of on-Site flood risk have been identified, with suitable mitigation provided, in accordance with relevant local, regional and national priorities. The report is structured to meet this purpose as follows:

- Section 3 discusses the planning context and policies which are relevant to flood risk and sustainable drainage;
- Section 4 describes the Site geology;
- Section 5 & 6 discuss the Site Flood Zone and vulnerability of the Proposed Development;
- Section 7 provides a detailed flood risk assessment; and
- Section 8 provides a sustainable drainage systems appraisal.

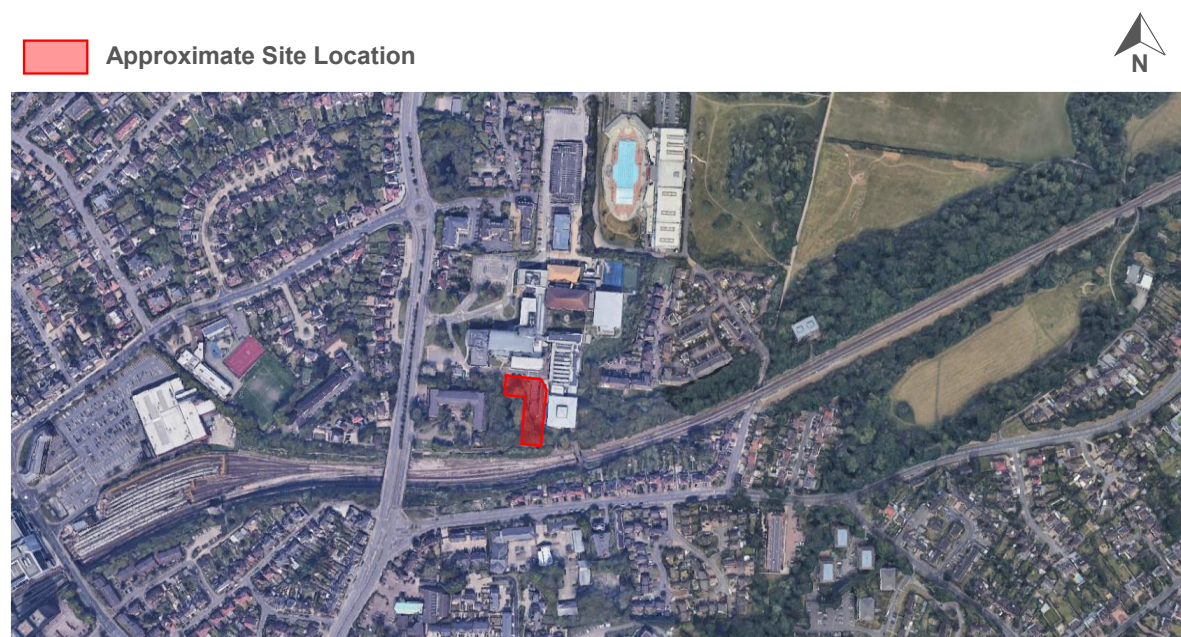
- 2.3 In relation to Flood Risk, the National Planning Policy Framework (NPPF) highlights the importance of considering not only the likelihood of the Site flooding, but also the consequences of such an event. This Flood Risk Assessment reviews the Dite in the context of a 1 in 100-year storm event, enhanced by 40% climate change (CC) allowance, and takes into consideration the following factors:

- The risk of flooding arising from the Proposed Development from all possible sources.
- The risk of flooding of the existing surrounding buildings following the Proposed Development.
- The existence of any flood defences.
- The consequence of the failure of the flood defences.
- The effects of flooding events on people, property and the environment.
- The vulnerability of those using the Proposed Development as set out in the Vulnerability Classifications, including safe access to the development during periods of flooding.
- The identification of flood risk reduction and mitigation measures.

Site and Context

- 2.4 The Site (Appendix A1) is located within the south of the established campus of Uxbridge College, Park Road, Uxbridge. The Site is currently occupied by a single-storey building that is functionally outdated and no longer fit for purpose, failing to meet modern teaching and workshop standards. It also lacks the capacity and infrastructure to meet and support future demand. The wider Uxbridge College campus comprises a mix of buildings of varying age, scale and architectural style, in addition to established internal access routes, servicing arrangements and connections to the surrounding area. The area surrounding the wider campus includes individual residential properties and a three-storey block of flats to the west, a railway line to the south, Park Road to the east, and individual residential properties and areas of open space to the east.
- 2.5 The River Pinn is located approximately 340m to the southeast of the Site, whilst the River Colne is located approximately 900m to the west.
- 2.6 The approximate location of the Site is shown in Figure 2.1 below, whilst the Site Location Plan is provided in Appendix A1.

Figure 2.1 **Approximate Site Location**



- 2.7 The description of the Proposed Development is as follows:

“Demolition of an existing single-storey building and its replacement with a temporary three-storey portakabin building for a period of 5 years.”

3. PLANNING POLICY FRAMEWORK

- 3.1 The Proposed Development has been designed to comply with national, regional and local policy requirements. The specifics of such national and local policy are detailed below.

National

National Planning Policy Framework (NPPF; August 2026)

- 3.2 The National Planning Policy Framework (NPPF; 2026) sets the overarching guidelines with regards to flood risk, and drainage planning within the UK within section **18 – Managing flood risk and coastal change**.

- **Policy F4: Assessing flood risk for decision-making** states that:
 1. To inform the assessment of flood risk and, where relevant, appropriate mitigation, a site-specific flood risk assessment should accompany all development proposals in Flood Zones 2, 3a and 3b as defined in Annex F, table 1.
 2. In Flood Zone 1, a site-specific flood risk assessment should inform and accompany all development proposals involving:
 - a. Sites of one hectare or more;
 - b. Land which has been identified by the Environment Agency as having critical drainage problems; and
 - c. Land identified in a strategic flood risk assessment or the Flood Map for Planning as being at risk of flooding from any source, whether now or in the future.
 3. Site-specific flood risk assessments should be appropriate to the scale, nature, and location of the development and should, where relevant, support an assessment of whether a development proposal satisfies the sequential and exception tests set out in policies F5 and F6.
- **Policy F5: The sequential test** states that:
 1. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Where the test applies, development proposals should not be located in areas at risk of flooding where alternative sites, appropriate for the development, are reasonably available in areas with a lower risk of flooding. The area to which the test is applied should not be greater than the anticipated catchment of development in terms of its likely occupiers or users.

-
2. The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, other than for:
 - a. Sites allocated in the development plan which were subject to the sequential test during plan preparation;
 - b. Sites where a site-specific flood risk assessment demonstrates clearly that:
 - i. No built development within the site boundary, including access or escape routes, land raising of other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk); or
 - ii. Where the site would be at risk of surface water flooding only, the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development without increasing flood risk elsewhere in accordance with policy F7.
 - c. For the following types of development:
 - i. Householder development;
 - ii. Small non-residential extensions (with a footprint of less than 250m²); and
 - iii. Changes of use, other than changes of use to a caravan, camping or chalet site, or to a mobile home or park home site.
 3. The strategic flood risk assessment covering the area of the proposed development and the Flood Map for Planning should provide the evidential basis for applying the sequential test.
- **Policy F6: Development in areas at risk of flooding from rivers or the sea** states that:
 1. In areas falling within flood zones 2, 3a or 3b (as defined in Annex F, table 1):
 - a. Development proposals should be refused if the use is incompatible with the risk from river or sea flooding, as set out in Annex F, table 3; and
 - b. In certain other circumstances set out in Annex F, table 3, in addition to satisfying the sequential test in Policy F5 where applicable, development will only be appropriate where an 'exception test' is satisfied. The exception test involves demonstrating that the development would meet all the following criteria:
 - i. Provide wider sustainability benefits to the community that outweigh the flood risk
 - ii. Be safe for its anticipated lifetime in accordance with policy F7; and
-

-
- iii. Not increase flood risk elsewhere and, where possible, reduce flood risk overall.
2. The application of the exception test should be informed by a site-specific flood risk assessment. The exception test does not need to be applied:
 - a. To those forms of development, or in those circumstances, where the sequential test is not required, as set out in in policy F5; or
 - b. Where development is proposed on a site allocated in the development plan to which the exception test was applied at the plan-making stage, unless there has been a significant increase in the risk of flooding to the site subsequently, or the nature of the development itself has changed significantly from that which was allocated so as to introduce a more vulnerable use (having regard to Annex F, table 2).
- **Policy F7: Ensuring development is safe from flooding** states that:
 1. Development proposals should not present a risk from flooding to potential occupiers, users, or visitors, and should not increase flood risk elsewhere.
 2. Where development is proposed in a location known to be at risk from any form of flooding, now or in the future, it should be refused unless:
 - a. Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons which justify a different arrangement;
 - b. The development will be safe throughout its lifetime taking account of the vulnerability of its users;
 - c. Any residual risk can be safely managed, and safe access and escape routes are included where appropriate, as part of an agreed emergency plan;
 - d. The development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment; and
 - e. It can be demonstrated that flood risk will not be increased elsewhere.
 - **Policy F8: Sustainable drainage systems and watercourses** states that:
 1. Development proposals which could affect drainage on or around the development site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, in ways which are proportionate to the nature and scale of the proposal. The systems employed should provide multifunctional benefits where possible, facilitating improvements in water quality, biodiversity and amenity.
 2. Sustainable Drainage Systems should:
-

-
- a. Be designed in accordance with the National Standards for Sustainable Drainage Systems;
 - b. Have maintenance arrangements in place to ensure an acceptable standard of operation for the anticipated lifetime of the development; and
 - c. In the case of proposals for major development, take account of advice from the Lead Local Flood Authority.
3. Development proposals should not enclose existing watercourses where this is not already the case, unless there are compelling reasons to do so; and should where possible remove existing culverts and renaturalise existing river channels, unless to do so would increase flood risk, result in other environmental harm or cause harm to heritage assets.

National Standards for Sustainable Drainage Systems (SuDS; June 2025)

- 3.3 The National Standards for Sustainable Drainage Systems (SuDS) provides information for designers, property developers, local authorities and other interested parties with respect to the design of surface water drainage systems for new infrastructure and development. The standards apply only to the management of surface water that is essentially uncontaminated, and which consists primarily of rainwater.
- 3.4 Two standards are set out:
 - The hierarchy standard (Standard 1), which sets out the criteria for prioritising the choice of final runoff destination; and
 - The fixed standards (Standards 2 to 7), which state the minimum design criteria that all surface water drainage systems should satisfy, as well as how they should be built, maintained and operated.
- 3.5 **Standard 1: runoff destination** states that runoff from development should be discharged to the following final destinations, in accordance with the hierarchy set out below:
 - Collected for non-potable use;
 - Infiltrated to the ground;
 - Discharged to an above ground surface water body;
 - Discharged to a surface water sewer, or another piped surface water drainage system; and
 - Discharged to a combined sewer.

-
- 3.6 **Standard 2: management of everyday rainfall (interception)** states that an approach should be implemented that ensures that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems.
- 3.7 **Standard 3: management of extreme rainfall and flooding** states that measures should be adopted to address the management of development runoff during extreme rainfall, including for allowances for climate change and urban creep. This should be applied in order to protect people and property from flooding of the surface water drainage system, mitigate increased flood risk adjacent to or downstream from the development, and protect the receiving water body from morphological damage, or impact on the sewer capacity.
- 3.8 **Standard 4: water quality** states that an approach should be applied that protects surface waters, groundwater and coastal waters by managing the quality of surface water runoff to adequately address water quality risks.
- 3.9 **Standard 5: amenity** states that an approach should be adopted which maximises benefits for amenity through the creation of multi-functional places and landscapes.
- 3.10 **Standard 6: biodiversity** states that systems should maximise biodiversity value by:
- Creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity;
 - Supporting and promoting natural local habitat species, for example, through local nature recovery strategies (LNRS);
 - Contributing to the delivery of local biodiversity strategies; and
 - Contributing to habitat connectivity.
- 3.11 **Standard 7: design of drainage for construction, operation, maintenance, decommissioning and structural integrity** states that an approach should be taken which ensures that surface water drainage systems are designed so they can be easily and safely constructed, operated and maintained, taking account of the need to minimise negative impacts on natural resources and the environment.

Regional

The London Plan (March 2021)

3.12 The London Plan (2021) sets out two main policies relating to flood risk and sustainable drainage systems, the specifics of which are detailed below.

- **Policy SI12 – Flood Risk Management** states that current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers. Development plans should use the Mayor's Regional Flood Risk Appraisal and their strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks.
- **Policy SI13 – Sustainable Drainage** states that Lead Local Flood Authorities should identify areas of heightened risk of surface water runoff through their Local Flood Risk Management Strategies and Surface Water Management Plans. Furthermore the policy outlines that development proposals should aim to achieve greenfield runoff rates and ensure that surface water runoff is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:
 1. Rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation);
 2. Rainwater infiltration to the ground at or close to source;
 3. Rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens);
 4. Rainwater discharge direct to a watercourse (unless not appropriate);
 5. Controlled rainwater discharge to a surface water sewer or drain; and
 6. Controlled rainwater discharge to a combined sewer.

Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

Draft London Plan (July 2026)

3.13 The draft London Plan, published for consultation in July 2026, sets out a proposed strategy for spatial development in Greater London, including policies that deal with development and use of land. The draft London Plan which, once adopted, will run to 2046/47, sets out requirements for homes, jobs, transport, and other infrastructure, in addition to policies to ensure good quality development. Policies relating to sustainable development are set out within Chapter 5 (Creating a greener, healthier, and resilient city). Key policies of relevance to the Proposed Development are as follows:

- **Policy GHR5 – Flood risk and drainage** states that development proposals should not increase surface-water runoff; and should maximise opportunities to reduce surface-water flood risk in a manner that is consistent with an integrated water management approach. This means that they should do the following:
 - (1) Avoid increasing impermeable surfaces and incorporate at least some surface-water capture, reuse and attenuation.
 - (2) In the case of referable development, aim to achieve on-site greenfield run-off rates as measures in Qbar (mean average flood flow or 3l/s/Ha (whichever is higher) through a combination of on-site and (contributions to) off-site sustainable drainage measures. In doing so:
 - i. on-site measures should be prioritised subject to the consideration in (3) below
 - ii. off-site contributions should be calculated using the latest London-wide reference rate or an area-specific one where established.
 - (3) Design on-site measures with reference to the drainage hierarchy, whilst acknowledging that, where a neighbourhood approach to managing surface-water is in place locally, and/or where on-site opportunities are limited, off-site contributions to area-based SuDs development may be preferable to on-site grey solutions.
 - (4) Ensure suitable information is made available to update the local Flood Asset Register where new SuDs are proposed.

Local

London Borough of Hillingdon Local Plan: Part 1 – Strategic Policies (November 2012)

3.14 The London Borough of Hillingdon Local Plan: Part 1 – Strategic Policies (November 2012) sets out strategic objectives to address issues surrounding flood risk and drainage, as follows:

- **Policy EM6 – Flood Risk Management** states that the Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).

The subsequent Hillingdon Local Plan: Part 2 – Site Specific Allocations LDD will be subjected to the Sequential Test in accordance with the NPPF. Sites will only be allocated within Flood Zones 2 or 3 where there are overriding issues that outweigh flood risk. In these instances, policy criteria will be set requiring future applicants of these sites to demonstrate that flood risk can be suitably mitigated.

The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.

London Borough of Hillingdon Local Plan: Part 2 – Development Management Policies (January 2020)

3.15 The London Borough of Hillingdon Local Plan: Part 2 – Development Management Policies (January 2020) sets out detailed policies to address issues surrounding flood risk and drainage, as follows:

- **Policy DMEI 9 – Management of Flood Risk** states that:
 - A) Development proposals in Flood Zones 2 and 3a will be required to demonstrate that there are no suitable sites available in areas of lower flood risk. Where no appropriate sites are available, development should be located on the areas of lowest flood risk within the site. Flood defences should provide protection for the lifetime of the development. Finished floor levels should reflect the Environment Agency's latest guidance on climate change).
 - B) Development proposals in these areas will be required to submit an appropriate level Flood Risk Assessment (FRA) to demonstrate that the development is resilient to all sources of flooding.
 - C) Development in Flood Zone 3b will be refused in principle unless identified as an appropriate development in Flood Risk Planning Policy Guidance. Development for appropriate uses in Flood Zone 3b will only be approved if accompanied by an appropriate FRA that demonstrates the development will be resistant and resilient to flooding and suitable warning and evacuation methods are in place.
 - D) Developments may be required to make contributions (through legal agreements) to previously identified flood improvement works that will benefit the development site.
 - E) Proposals that fail to make appropriate provision for flood risk mitigation, or which would increase the risk or consequences of flooding, will be refused.
- **Policy DMEI 10 – Water Management, Efficiency and Quality** states that:
 - A) Applications for all new build developments (not conversions, change of use, or refurbishment) are required to include a drainage assessment demonstrating that

appropriate sustainable drainage systems (SuDS) have been incorporated in accordance with the London Plan Hierarchy (Policy 5.13: Sustainable drainage).

- B) All major new build developments, as well as minor developments in Critical Drainage Areas or an area identified at risk from surface water flooding must be designed to reduce surface water run-off rates to no higher than the pre-development greenfield run-off rate in a 1:100 year storm scenario, plus an appropriate allowance for climate change for the worst storm duration. The assessment is required regardless of the changes in impermeable areas and the fact that a site has an existing high run-off rate will not constitute justification.
- C) Rain Gardens and non householder development should be designed to reduce surface water run-off rates to Greenfield run-off rates.
- D) Schemes for the use of SuDS must be accompanied by adequate arrangements for the management and maintenance of the measures used, with appropriate contributions made to the Council where necessary.
- E) Proposals that would fail to make adequate provision for the control and reduction of surface water run-off rates will be refused.
- F) Developments should be drained by a SuDS system and must include appropriate methods to avoid pollution of the water environment. Preference should be given to utilising the drainage options in the SuDS hierarchy which remove the key pollutants that hinder improving water quality in Hillingdon. Major development should adopt a 'treatment train' approach where water flows through different SuDS to ensure resilience in the system.

West London Strategic Flood Risk Assessment (SFRA) for the boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Hounslow (April 2018)

- 3.16 The West London Strategic Flood Risk Assessment (SFRA; 2018) provides a strategic overview of all forms of flood risk throughout the boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Hounslow, both at present and in the future. It has been designed to help address local requirements, manage development requirements, and manage the risk of flooding posed to both residents and buildings.
- 3.17 All six boroughs fall under Sub-area 9, London catchments, in the Thames Catchment Flood Management Plan. The London Borough of Hillingdon falls within the River Crane sub-catchment area, via the Yeading Brook, and the River Colne sub-catchment area, via the River Pinn. The West London SFRA highlights areas at risk of fluvial flooding, as well as those that currently benefit from flood defence schemes. It is noted that the structural failure of fluvial flood defences presents a residual risk, for to the breaching or overtopping of defended areas. With respect to tidal flood risk, the West London SFRA notes that the River Thames is a risk of tidal flooding, but that within the West London sub-region, only the boroughs of Hounslow and Ealing are at risk from this source.

Further to this, it is highlighted that the Thames Tidal Defences (TTD), a collection of walls, embankments, flood gates, pumping stations and barriers, provide protection against this source of flooding. At this time, the Thames Barrier, which is the most significant structure within the TTD, offers protection up to 2070, with recommendations within the TE2100 plan for the same level of protection to be provided up until 2100.

- 3.18 In terms of surface water flood risk, it is highlighted that occurs as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or a watercourse. This source of flooding is often exacerbated by the intensity or duration of the rainfall event overwhelming drainage points, leaving soil, drainage channels and other drainage systems incapable of draining water away at a sufficient rate. The majority of the ground coverage within the West London area is impermeable, due to the heavily urbanised nature of the area. This can therefore compound the risk of surface water flooding, as the rate of runoff from impermeable surfaces is greater than from permeable surfaces, and less water is able to drain directly into the ground via infiltration. The presence of Critical Drainage Areas (CDAs), which are specific geographic areas that have been identified as having multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) during heavy weather periods, leaving people, property and local infrastructure at risk, across the sub-region is also highlighted within the West London SFRA. CDAs are defined by a Borough's Surface Water Management Plan (SWMP), and do not include areas with critical drainage problems as designated by the Environment Agency.
- 3.19 It is highlighted within the West London SFRA that groundwater flooding occurs because of the underground water table rising, which can result in water emerging through the ground and causing flooding in extreme circumstances, with this type of flooding tending to occur after periods of heavy rainfall. The majority of the West London area is noted to be underlain by Thames Group (London Clay) bedrock, which generally has a low hydraulic conductivity, meaning water does not easily move through it. However, because of this characteristic and poor drainage ponding can occur if London Clay is present downhill of aquifer outcrops. Lambeth Group compositions and White Clay are also present within the northwestern part of the sub-region, with White Chalk particularly prone to groundwater flooding, due to its high hydraulic connectivity and low effective porosity. This means it can saturate quickly during intense rainfall events, recharging the water table, and therefore leading to water moving through the chalk and out onto the surface.
- 3.20 Further to the above, it is noted that sewer flooding can occur due to infrastructure failure or due to an increased flow and volume of water entering a sewer system which exceeds its hydraulic capacity, causing the system to surcharge. Drainage in the sub-region is provided by Thames Water, who provide surface water, foul and combined sewer systems. Modern sewer systems are designed to be separate surface water and foul water systems, typically accommodating up to 1 in 30 year rainfall events. However, sewer system segments across London vary in capacity due to age. Older

segments have a smaller capacity and may not be designed to accommodate rainfall events as significant as 1 in 30 year events.

London Borough of Hillingdon Surface Water Management Plan (SWMP; January 2014)

- 3.21 As detailed within the London Borough of Hillingdon Surface Water Management Plan (SWMP; January 2014), there is potential that approximately 29,300 residential properties and 1,300 non-residential properties are at risk of surface water flooding of greater than 0.03m depth (above an assumed 0.1m building threshold) during a rainfall event with a 1 in 100 probability of occurrence in any given year (0.1% Annual Exceedance Probability (AEP)).
- 3.22 DEFRA recognised the importance of addressing surface water flooding in London and fully funded the Drain London project to produce SWMPs for each London borough. The Drain London project is broken down using a “tier” based approach.
- 3.23 As part of this approach, the borough must define a list of prioritised CDAs for potential further study or capital works. According to the SWMP, the Site is not located within an CDA. The closest CDA is to the Site is the Group1_025. The main source of flooding within this CDA, which is located in proximity to Uxbridge Station and London Underground Line to the south and southwest of the Site, is considered to be associated with a continuous flow path to the station. It is noted, however, that the Environmental Agency model may have trapped water upstream of this area as the model does not include any structures, and there are no supporting records of historic flooding within this CDA.
- 3.24 Past records of surface water flooding within Hillingdon have been gathered from sources such as the Environment Agency, London Underground as well as the London Borough of Hillingdon; however, there are limited records of surface water flooding in the London Borough of Hillingdon that can be used to verify modelling results. Anecdotal support for several of the locations identified as being susceptible has been provided by Council staff, however.

4. SITE GEOLOGY

- 4.1 Geological information provides an indication of the permeability of the Site. The British Geological Survey (BGS) 'Geology of Britain Viewer' describes bedrock of the Site as London Clay Formation – comprising “bioturbated or poorly laminated, blue-grey or grey brown, slightly calcareous, silty to very silty clay, clayey silt, and sometimes silt, with some layers of sandy clay” (summary quoted from BGS).
- 4.2 The superficial deposits comprise Black Park Gravel Member – Sand and Gravel, described as “Sand and gravel, with possible lenses of silt, clay or peat” (summary quoted from BGS).
- 4.3 The images below have been taken directly from the BGS Geology of Britain Viewer and display the bedrock and superficial deposits present at the Site.

Figure 4.1 Bedrock Geology

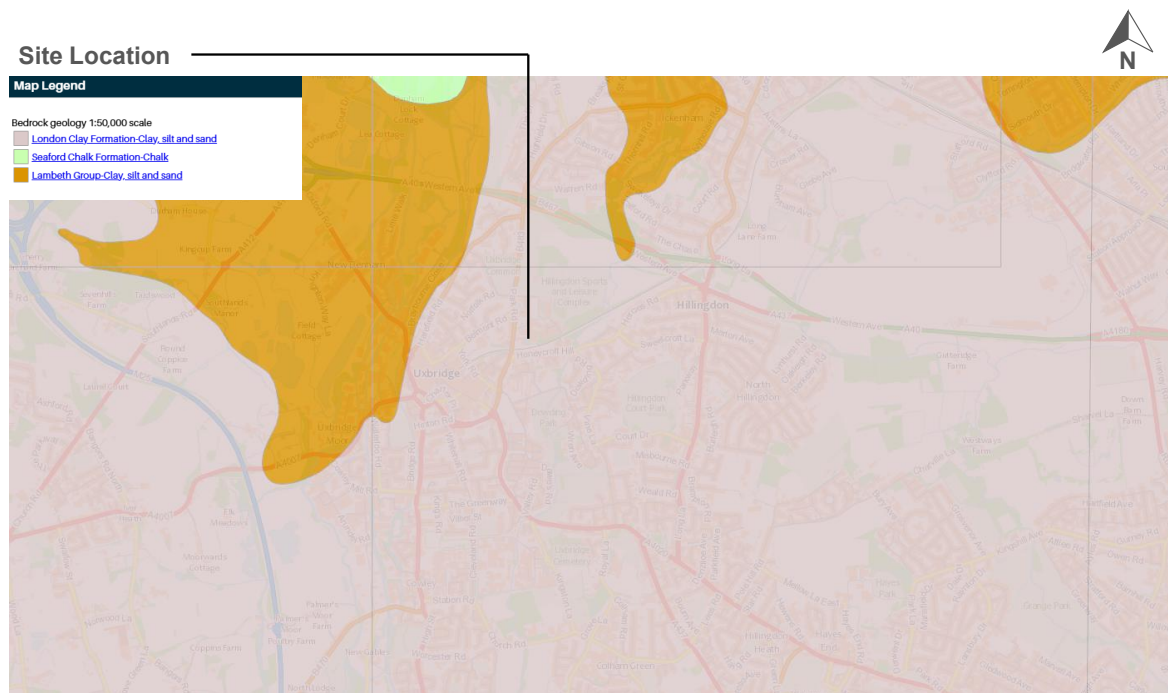
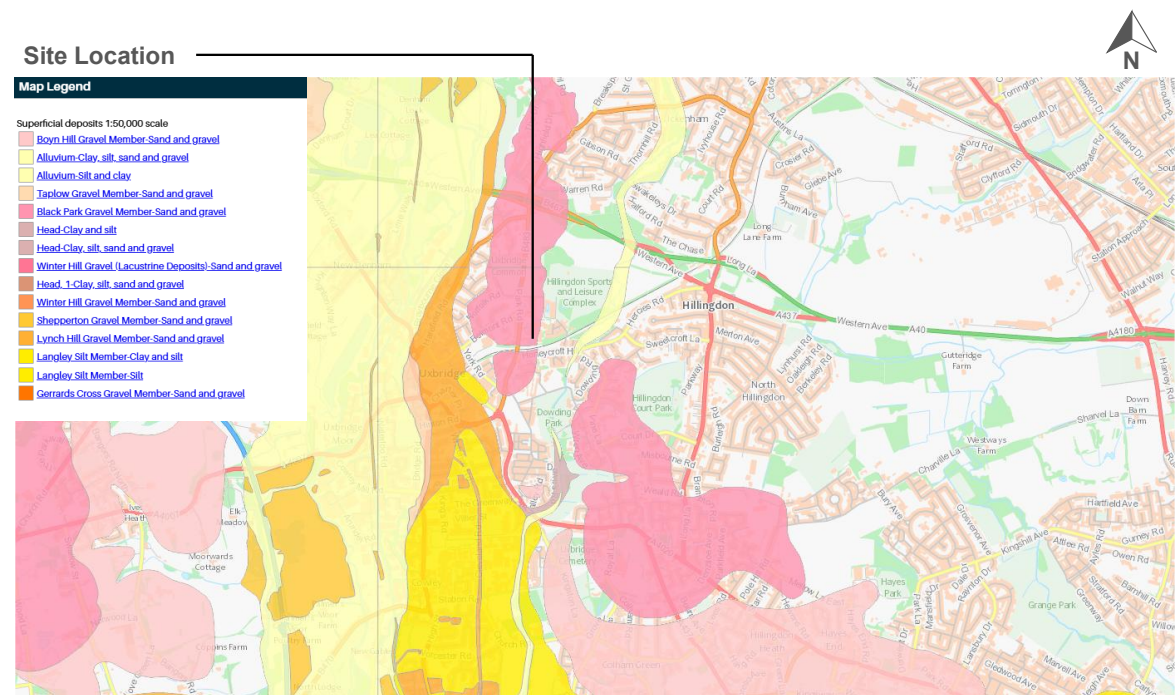
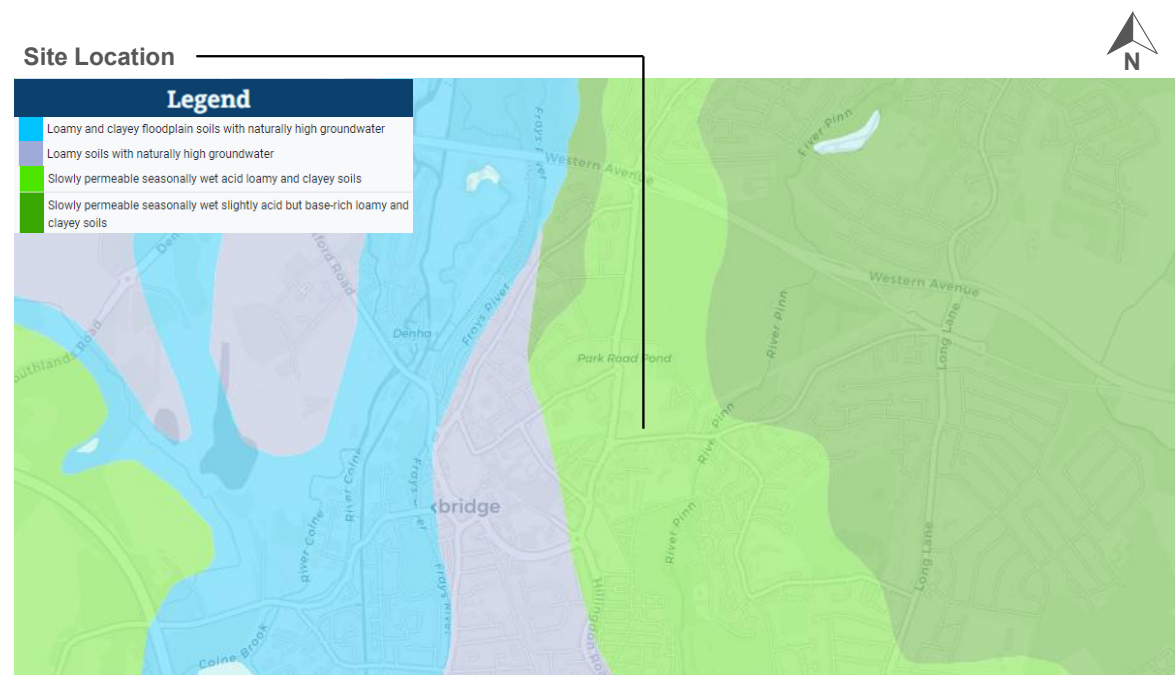


Figure 4.2 Superficial Deposits



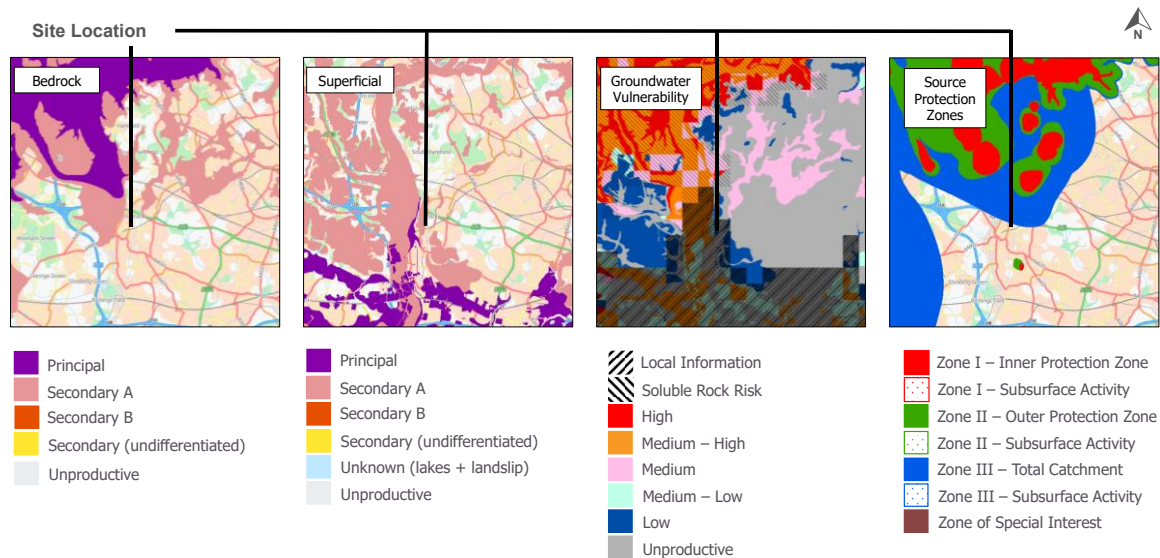
4.4 The image below is taken directly from the LandIS Soilsmapes map and displays the soil types present at the Site. The Land Information System's (LandIS) 'Soilsmapes map' describes the soil at the Site as "Slowly permeable seasonally wet acid loamy and clayey soils" (summary quotes from LandIS).

Figure 4.3 Soilscape



- 4.5 The information presented in Figure 4.4 below shows the aquifers located within close proximity to the Site. This suggests that the bedrock underlying the Site is Unproductive, with the superficial deposits present at the Site potentially designated as a Secondary A Aquifer. Further to this, it has been determined that the Site is located within a region within which groundwater resources have a low vulnerability to pollution, with the Site being located at the edge of a Zone III (Total Catchment) Source Protection Zone.

Figure 4.4 Underlying Aquifers

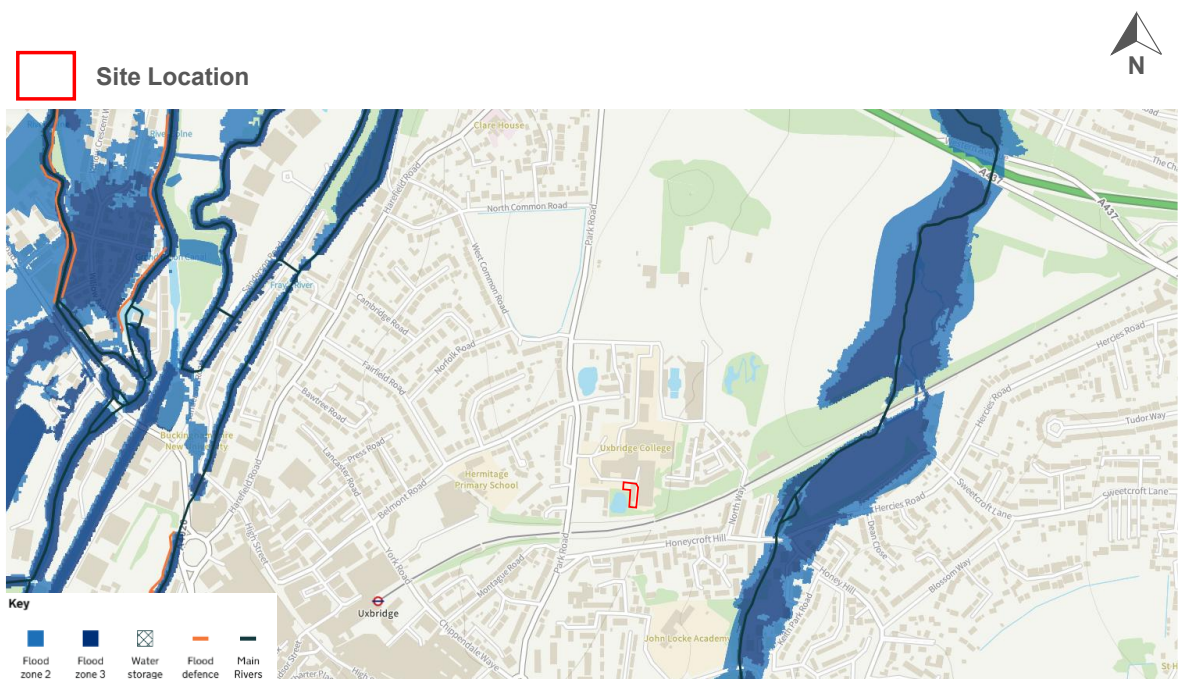


- 4.6 Based on the information presented above, the bedrock and superficial deposits present at the Site are likely to be highly impermeable due to their clayey nature. There are no aquifers underlying the Site, and the groundwater within the region that the Site is located is demonstrated to be largely unproductive, and therefore has low vulnerability to pollution.
- 4.7 Accounting for the anticipated impermeable nature of the underlying geology, the use of infiltration techniques for the management of surface water runoff at the Site is considered likely to be infeasible. This may be confirmed following the undertaking of infiltration testing on the Site, should this be required, however for the purposes of this report, it has been assumed that the use of infiltration techniques on the Site is not feasible.

5. DEVELOPMENT SITE FLOOD ZONE

- 5.1 The Environment Agency have developed a series of flood risk maps that identify a site's specific fluvial or tidal flood risk.
- 5.2 From Figure 5.1 below, it can be seen that the Site sits wholly within Flood Zone 1. This demonstrates that the Site is at low risk of flooding from fluvial or tidal sources, with a predicted probability of less than 1 in 1,000 chance of flooding on an annual basis.

Figure 5.1 Site-specific Flood Zone



- 5.3 Based on the information presented in Tables 6.1 and 6.2, Flood Zone 1 is suitable for developments of any nature.

6. SITE VULNERABILITY

- 6.1 A development's vulnerability to flood risk is dependent on its intended use and is summarised within the NPPF. Each type of proposed development can be categorised into one of five vulnerability categories, summarised within Table 6.1.
- 6.2 The grouping of building type into particular vulnerability categories is dependent on the building's need to stay operational during a flood event. In the case where a mixed-use building falls within two vulnerability categories, a worst-case approach should be adopted.

Table 6.1 Flood risk vulnerability and development compatibility

Essential Infrastructure
• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms. • Hydrogen production facilities. • Carbon Capture, distribution and storage facilities. • Heat networks. • Data Centres. • Electric vehicle charging stations.
Highly vulnerable
• Police and ambulance stations; fire stations and command centres. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent or which fall under The Control of Major Accident Hazards Regulations 2015. Where there is a demonstrable need for such installations – including bulk storage associated with port or similar facilities, and energy infrastructure and carbon capture or storage – to be located at coastal, water-side, or other high flood risk areas, they should be classified as 'Essential Infrastructure'. • Installations requiring a radioactive substances regulations permit for disposal to landfill or dedicated near-surface disposal by burial.
More vulnerable

• Hospitals • Residential institutions such as care homes, children's homes, social service homes, prisons and hostels. • Buildings used for dwelling houses (including floating/rising designs), student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less vulnerable
• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for: shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals workings and processing (except for sand and gravel working). • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. • Car parks. • Land-raising (unless part of or enabling a development with a higher vulnerability classification).
Water compatible
• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigational facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

6.3 As the Proposed Development seeks to replace the existing single-storey building with a temporary three-storey portakabin to re-provide and expand the existing educational facilities, the Proposed Development is considered to be within the “More Vulnerable” category¹.

6.4 Table 6.2 below summarises the developments suitable for construction based on flood zone.

Table 6.2 Flood risk vulnerability and development compatibility

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test	✓	✓	✓
Zone 3a	Exception Test	x	Exception Test	✓	✓
Zone 3b	Exception Test	x	x	x	✓

6.5 As the Proposed Development is considered as “More Vulnerable”, and is located within Flood Zone 1, it can be concluded that the proposals are suitable within the Site.

¹ Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

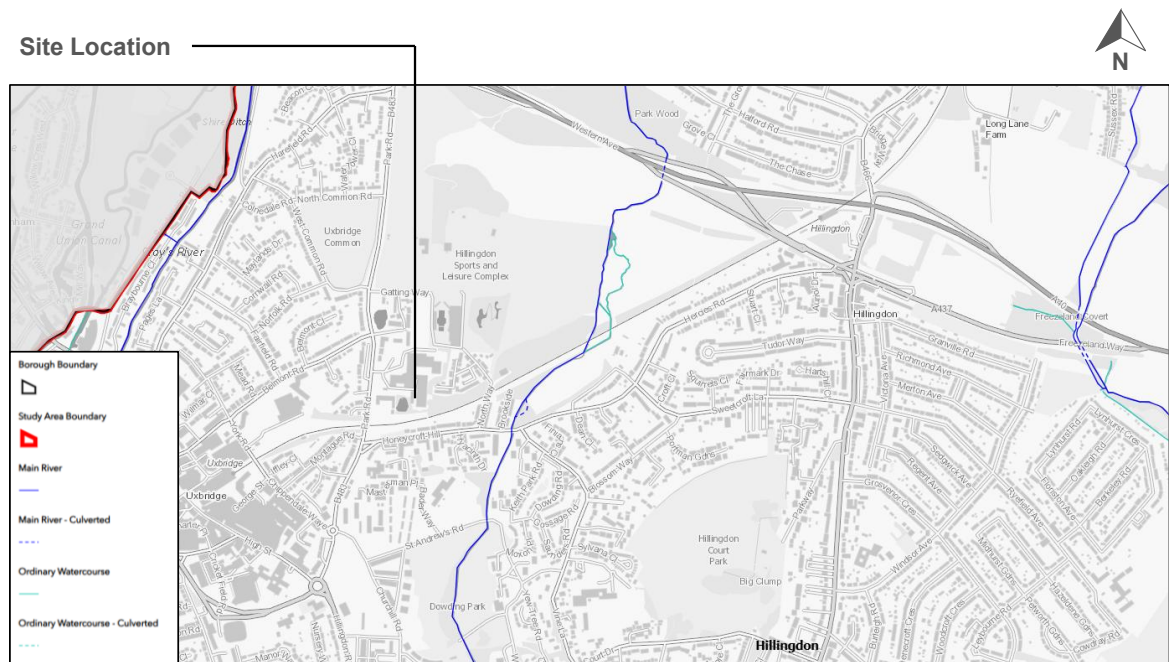
7. FLOOD RISK ASSESSMENT

- 7.1 The following section of this report presents the findings of the flood risk assessment. This assessment analyses the flood risk associated with both natural and artificial sources.

Fluvial and Tidal Flooding

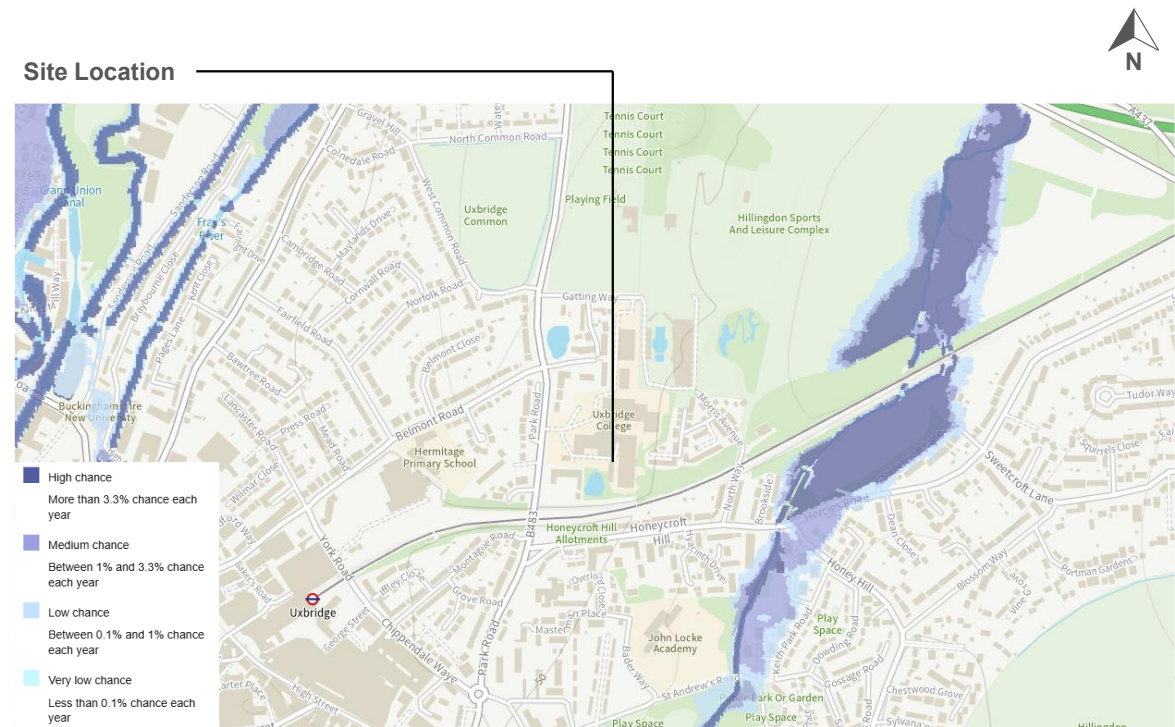
- 7.2 As described above, sites within Flood Zone 1 are considered to be at very low risk of fluvial or tidal flooding. This is predominantly dependent on the site's proximity to a surface water body.
- 7.3 Figure 7.1 below, taken from the West London SFRA, shows that the Site is located within proximity to a main river to the southwest and west. The Site is located approximately 340m to the northwest of the River Pinn, and 900m to the east of the River Colne.

Figure 7.1 Main Rivers and Ordinary Watercourses Surrounding the Site



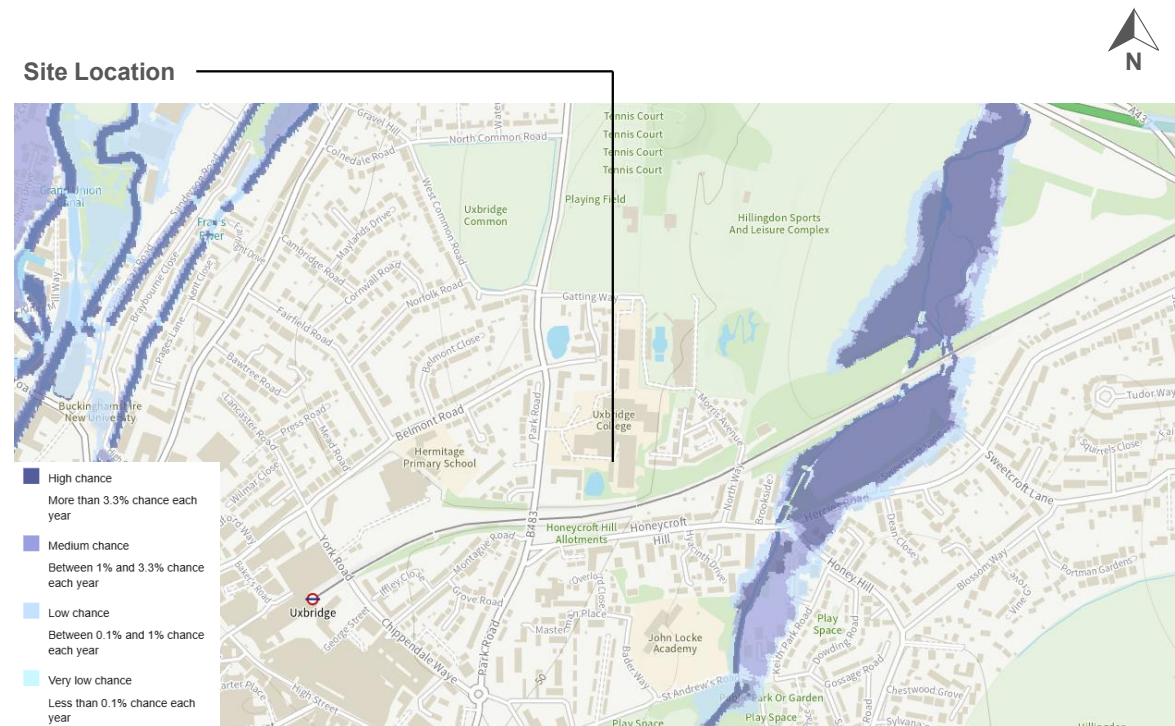
- 7.4 Figure 7.2 indicates that the Site is at very low risk from flooding from fluvial or tidal sources in the present day. As noted above, the Site is located within proximity to two main rivers. However, due to the separation between the Site and these rivers, it falls wholly within Flood Zone 1 and is at very low risk of fluvial or tidal flooding. Confirmation of this flood risk is displayed in Figure 7.2 below.

Figure 7.2 Level of Flood Risk from Rivers and Seas in the Present Day



7.5 Figure 7.3 below demonstrates that the Site will also be at very low risk of fluvial or tidal flooding in the future for the period 2036 to 2069.

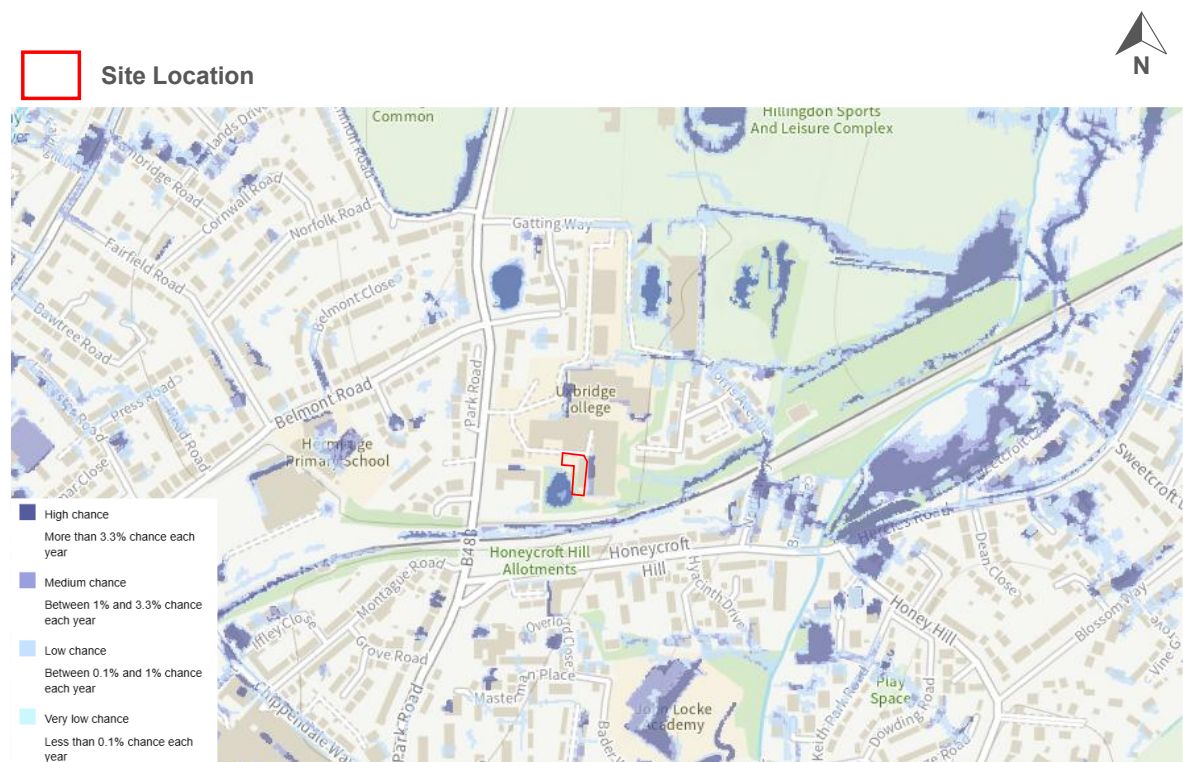
Figure 7.3 Level of Flood Risk from Rivers and Seas in the Future (2036 – 2069)



Pluvial Flooding (Overland Flow)

- 7.6 Pluvial, or surface water flooding, is caused by intense rainfall on saturated or impermeable ground, causing rapid runoff of water over the surface of a site. Typically, this will cause intense flooding in low lying areas throughout the duration and immediately after the storm event. This can also occur when extreme rainfall events prevent discharge to drainage infrastructure or waterbody at a fast enough rate.
- 7.7 As with fluvial and tidal flood risk, the Environment Agency have produced an indicative flood map that demonstrates site-specific pluvial flood risk. This is presented in Figure 7.4 below.

Figure 7.4 Surface Water (Pluvial) Flood Risk in the Present Day



- 7.8 Figure 7.4 above indicates that the vast majority of the Site itself is at very low risk of flooding from surface water flooding. This indicates that the Site has a less than 0.1% chance of flooding from this source each year. There are, however, localised regions to the east and southwest of the existing building that are demonstrated to be at low (less than 1% chance) to high (more than 3.3% chance) risk of flooding from surface water sources each year.
- 7.9 Further to the above, it is demonstrated in Figure 7.5 below that there is a very low chance of surface water flood depths of up to 20cm, 30cm, 60cm or 90cm across the Site. The areas of risk to the east and southwest of the Site are shown to be at very low risk of experiencing surface water flood depths of up to 90cm, with a very low chance of flood depths up to 60cm occurring to the southwest, and a low to medium chance of surface water flooding to this depth occurring to the east. The area to the

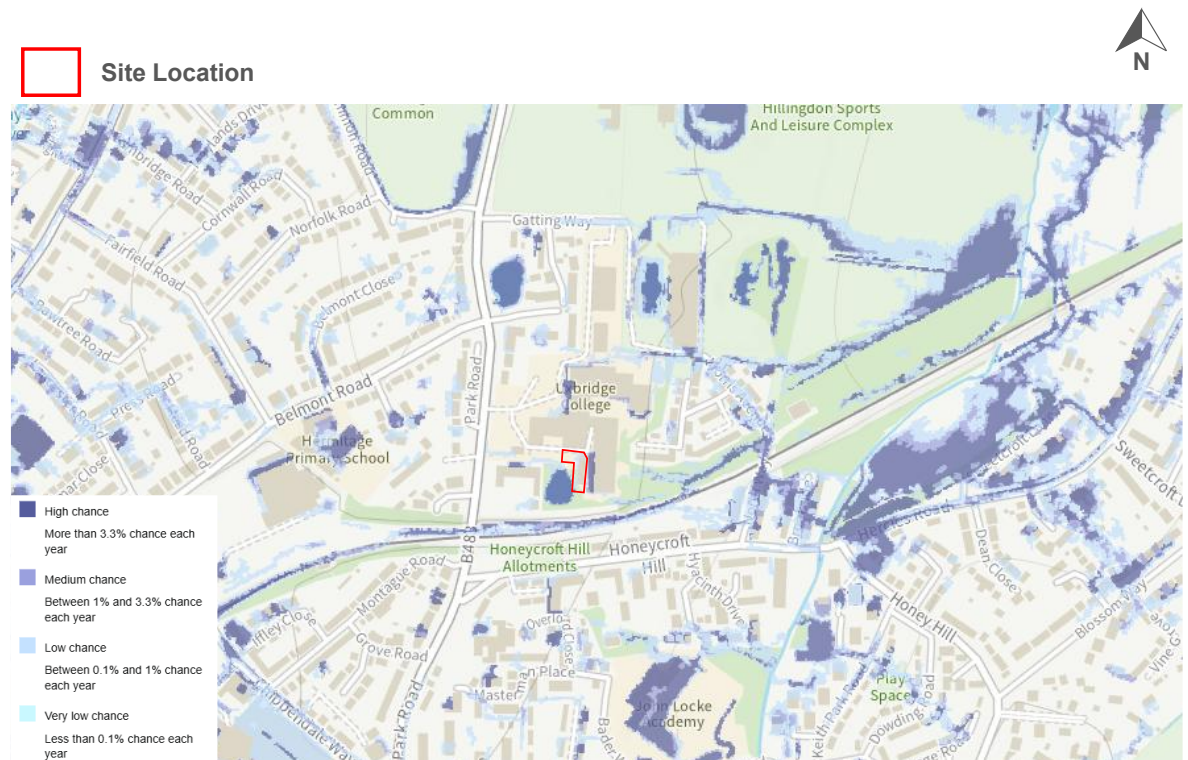
east is shown to be at low to medium risk of experiencing flood depths of up to 20cm and 30cm, whilst the area to the southwest is demonstrated to be at low to medium risk of experiencing surfacing water flooding up to 30cm, and low to high risk of experiencing surfacing water flood depths of up to 20cm.

Figure 7.5 Risk of Surface Water Flooding Extents and Depths in the Present Day



7.10 Figure 7.6 below demonstrates that the risk of surface water flooding on the Site in the future for the period 2040 to 2060 remains similar to the existing case. As per the present day, the vast majority of the Site is demonstrated to be at no risk of surface water flooding, with the exception of a highly localised area to the west of the existing building shown to be at very low to high risk of flooding from this source. The localised areas to the east and southwest of the Site continue to be at high risk of flooding from this source.

Figure 7.6 Surface Water (Pluvial) Flood Risk Between 2040 and 2060



- 7.11 Similarly, Figure 7.7 below suggests that both the extent and depth of surface water flooding at the Site in the future will largely remain as per the present day scenario. The exception is a highly localised area to the west of the existing building that is shown to be at very low risk of experiencing surface water flood depths of up to 20cm and 30cm in the future scenario. The areas of risk to the east and southwest of the Site continue to be shown to be at very low risk of experiencing surface water flood depths of up to 90cm, with a low chance of flood depths up to 60cm occurring to the southwest, and a low to medium chance of surface water flooding to this depth occurring to the east. The area to the east is shown to be at medium to high risk of experiencing flood depths of up to 20cm and 30cm, whilst the area to the southwest is demonstrated to be at low to high risk of experiencing surfacing water flood depths of up to 20cm and 30cm under the future scenario.

Figure 7.7 Risk of surface water flooding extents and depths between 2040 and 2060

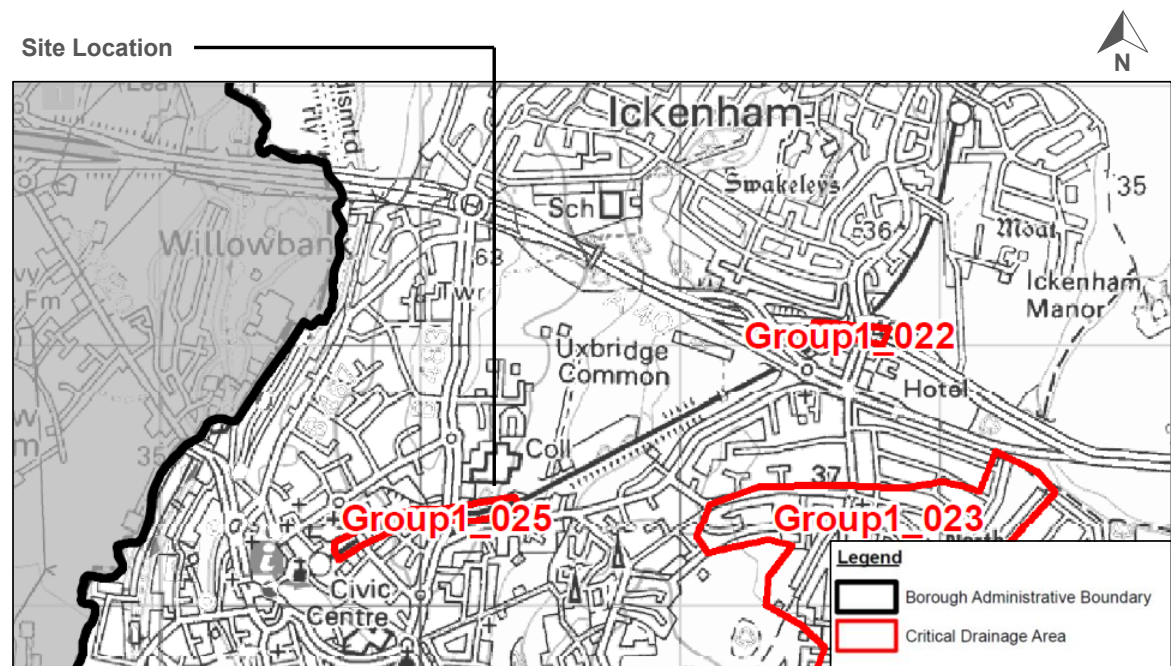


- 7.12 It is considered that the existing Site-specific characteristics, including the local topography, will ensure that, during periods of heavy rainfall, runoff will be channelled from the Site using the existing surface water drainage infrastructure. In addition to this, it is noted that the Proposed Development will not result in a significant increase in the hardstanding area of the Site, therefore there will be no significant exacerbation of the risk of flooding from surface water sources either on the Site or in the immediate surroundings as a result of the Proposed Development. The intention to retain large areas of the existing vegetation and soft landscaping, and the implementation of the proposed Landscape Strategy, which includes grass lawn seeding and the planting of three new oak trees, will also positively contribute to the management of the 5mm storm event runoff, and reduce runoff volume through the facilitation of interception and evapotranspiration. It is considered, therefore, that the overall risk of surface water flooding at the Site is very low, and that the Proposed Development will therefore be at very low risk of flooding from this source throughout its temporary, five-year operation.

Critical Drainage Area

- 7.13 A Critical Drainage Area (CDA) is defined as an area of “discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones (LFRZ) during severe weather thereby affecting people, property or local infrastructure.” LFRZ is defined as a discrete area of flooding that does not exceed the national criteria for a ‘Flood Risk Area’ but still affects houses, businesses or infrastructure.
- 7.14 As shown in Figure 7.8 below, adapted from the London Borough of Hillingdon Surface Water Management Plan (SWMP; 2014), the Site is not located within a CDA. The Site, therefore, is not considered to be at a heightened risk of flooding from surface water sources, nor from groundwater or ordinary watercourses. Figure 7.8, presented below, demonstrates that there is very limited risk of surface water flooding within the Site boundaries and the immediate surroundings.
- 7.15 It is noted that the closest CDA is Group1_025 (Uxbridge Station and London Underground Line). The main source of flooding within this CDA, which is located in proximity to Uxbridge Station and London Underground Line to the south and southwest of the Site, is considered to be associated with a continuous flow path to the station. It is noted, however, that the Environmental Agency model may have trapped water upstream of this area as the model does not include any structures, and there are no supporting records of historic flooding within this CDA. It is anticipated, therefore, that the risk of flooding present within the CDA is Group1_025 will not extend beyond the outlines shown in Figure 7.8 below. It is also anticipated that, due to the separation of the Site from the CDA and that fact that there will be no significant increase in the area of hardstanding at the Site, the Proposed Development will not result in an increased risk of surface water flooding within the Group1_025.

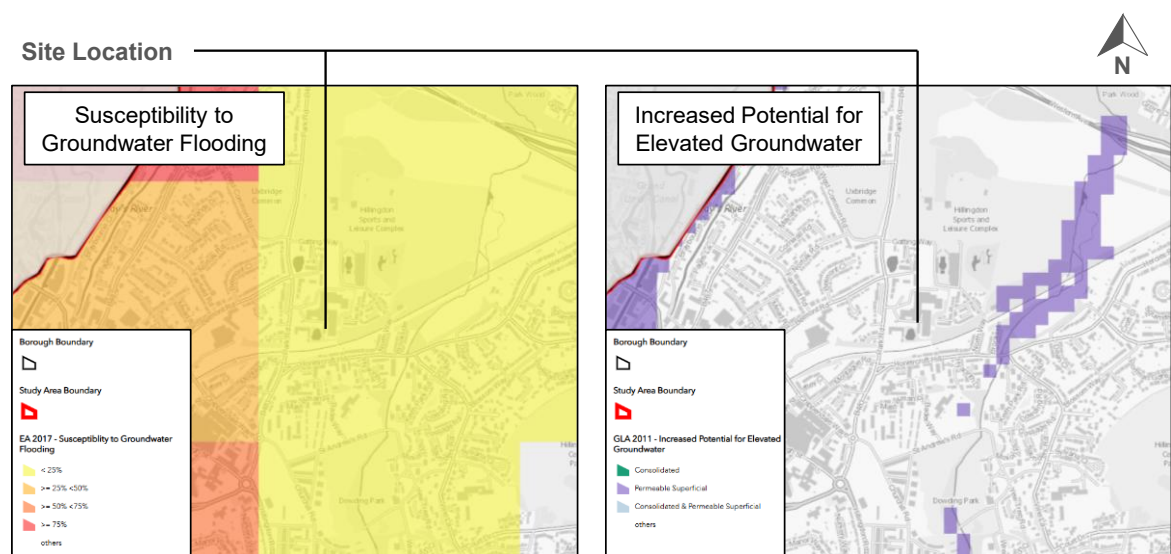
Figure 7.8 Critical Drainage Areas



Ground Water Flooding

7.16 Groundwater flooding typically occurs after a period of prolonged intense rainfall, causing the water table to rise above its natural level. The risk of groundwater flooding is heavily dependent on the composition of the underlying geology. As the Site is underlain by impermeable London Clay Formation, it is unlikely to lead to high groundwater levels. Despite this, there is a possibility of perched groundwater within more permeable superficial deposits. Figure 7.9, adapted from the West London SFRA maps, shows the areas within the borough with increased susceptibility to ground water flooding (left) and with increased potential for elevated groundwater levels (right).

Figure 7.9 Anticipated depth of groundwater below the ground level



- 7.17 Figure 7.9, above, demonstrates that the Site is located within a region within which less than 25% of the area has been identified as being susceptible to groundwater flooding. The Site is also demonstrated to be located outside of an area that is considered to be at potential for elevated groundwater.
- 7.18 Based on the information presented above, it is considered that the risk of groundwater flooding at the Site is very low, and that the Proposed Development will therefore be at very low risk of flooding from this source throughout its temporary, five-year operation.

Flooding from Sewers

- 7.19 Sewer flooding occurs when the existing capacity of the drainage infrastructure is exceeded during periods of heavy rainfall. Typically, modern sewer systems are designed to accommodate 1 in 30-year rainfall events.
- 7.20 Figure 7.10 below, taken from the West London SFRFA maps, displays the number of historic sewer flood incidences. From this, it can be seen that the Site is located within an area that has not experienced any flood events associated with the surcharging of sewers.

Figure 7.10 Sewer flooding recorded incidences

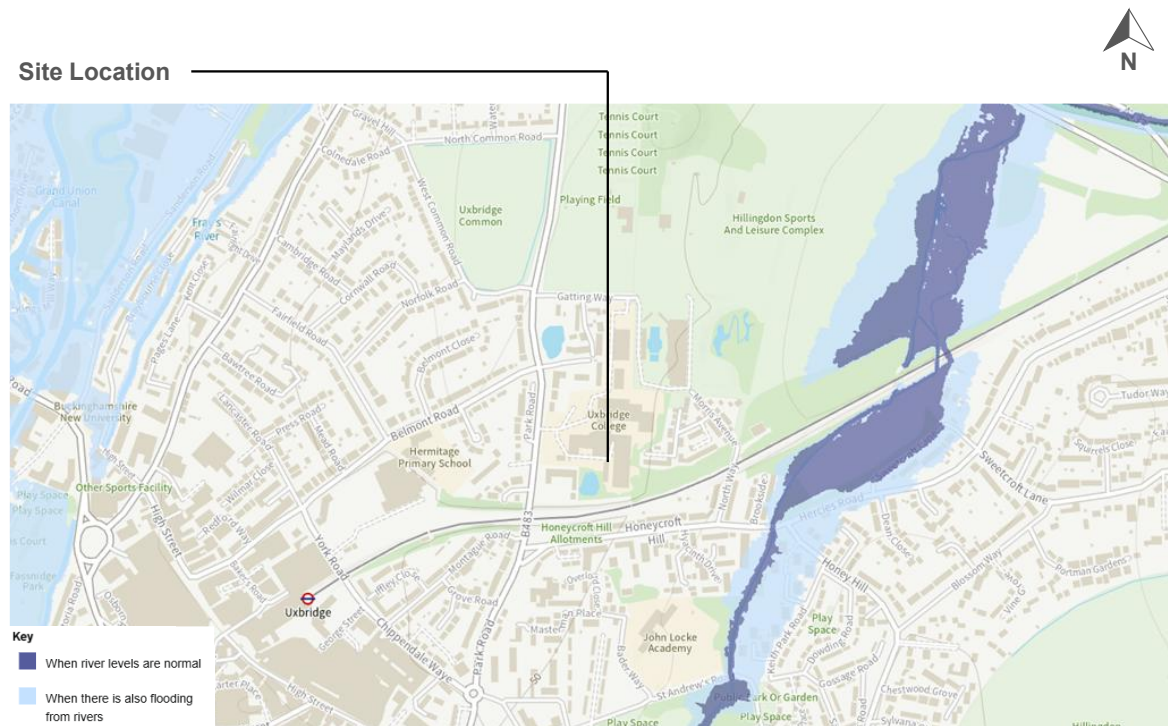


- 7.21 Whilst the Site is demonstrated to have historically been at low risk of flooding from sewer sources, it is noted that it is reasonable to assume that any new pipes or connections made as part of the Proposed Development will be in line with the latest best practice, which will further limit the risk associated with sewer surcharge.

Flooding from Reservoirs

- 7.22 Figure 7.11 below displays the maximum extent of flooding from reservoirs. From this it can be concluded that no risk exists from artificial sources. In addition to this, reservoirs are subject to statutory inspection and therefore no risk is anticipated in the future.

Figure 7.11 Reservoir flooding maximum extent



- 7.23 It is concluded that the Proposed Development will be at very low risk of flooding from this source throughout its temporary, five-year operation

8. SUSTAINABLE DRAINAGE SYSTEMS

- 8.1 Sustainable drainage systems (SuDS) aim to mimic the surface water flow from a site prior to its development. The strategy should aim to reduce the flood risk to the development site itself and elsewhere within the catchment.
- 8.2 In order to effectively manage surface water flood risk within urban sites, it is necessary to reduce the rate of surface water runoff. Historically, our urban centres have utilised piped systems that transport surface water to point of discharge as quickly as possible. This method of surface water management has now been disregarded as it is found to place additional strain on existing drainage infrastructure, increasing flood risk both on site and downstream of the development, reducing groundwater levels and increasing surface water contamination.
- 8.3 SuDS are designed to drain urban areas in a more natural way, utilising infiltration and storage where feasible. SuDS have a number of both environmental and social benefits that arise from the application of SuDS techniques. These include:
- Habitat formation through creating urban ecosystem networks;
 - Improvement in water quality leaving the site through attenuation and filtration; and
 - Creation of amenity space through developing green areas.
- 8.4 The Site is approximately 1,455m² in area and, as detailed above, is currently occupied by an existing single-storey building. The Proposed Development involves the replacement of the existing building with a three-storey portakabin building, which is to operate for a temporary period of five years. The Proposed Development will not result in a significant increase in the footprint of the building, and there will be only a minor increase in the area of hardstanding at the Site, which currently includes areas of concrete surfacing and two substations, alongside the existing building. The Proposed Development seeks to retain large areas of the existing soft landscaping, as well as to deliver planting as part of the proposed Landscape Strategy, which will continue to positively contribute to the management of the 5mm storm event runoff, and reduce runoff volume through the facilitation of interception and evapotranspiration. However, as the Proposed Development seeks to incorporate a new footpath to the west of the proposed three-storey temporary building, it is anticipated that the hardstanding area of the Site will increase from approximately 541m² in the existing case, to approximately 895m² in the post-development context.
- 8.5 Based on the existing conditions, the following runoff rates and volumes for the Site have been calculated (calculations are provided in Appendix A2):

Table 8.1 Existing surface water runoff rates and volumes for the Site for 6-hour storm

Return Period	Runoff Volume (l)	Runoff Rate (l/s)
Qbar	N/A	N/A
1 in 1 year (100% AEP)	32.5	1.5
1 in 30 year (3.33% AEP)	68.1	3.2
1 in 30 year (3.33% AEP) + 40% CC	95.3	4.4
1 in 100 year (1% AEP)	88.4	4.1
1 in 100 year (1% AEP) + 40% CC	123.8	5.7

Existing Drainage Network

- 8.6 For the purposes of this Flood Risk Assessment and Sustainable Drainage Strategy, it is assumed that a surface water drainage network is in place within the wider Uxbridge College campus and that this network also serves the Site. Infiltration is considered to be unfeasible at the Site, due to the impermeable nature of the underlying geology. It is reasonable to assume, therefore, that the Site, and any wider surface water drainage system that serves the wider Uxbridge College campus, connects to an existing Thames Water sewer network.

Proposed Sustainable Drainage System

- 8.7 The proposed drainage system aims to reduce surface water runoff at source as far as reasonably possible. Chapter 3 of the CIRIA SuDS Manual, Policy SI12 of the London Plan and Policy DMEI 10 of the London Borough of Hillingdon Local Plan: Part 2 – Development Management Policies state that developments should aim to achieve greenfield runoff rates wherever possible. In the case of the Site, the following greenfield runoff rates have been calculated (calculations are provided in Appendix A3):

Table 8.2 Greenfield runoff rates for the Site

Return Period	Runoff Rate (l/s)
Qbar	0.6
1 in 1 year (100% AEP)	0.5
1 in 30 year (3.33% AEP)	1.4
1 in 30 year (3.33% AEP) + 40% CC	N/A
1 in 100 year (1% AEP)	2.0
1 in 100 year (1% AEP) + 40% CC	N/A

- 8.8 However, considering the temporary nature of the Proposed Development, which will operate for only five years, the limited opportunities to incorporate large-scale ground level SuDS features due

to the limited area of the Site, the very low greenfield and existing runoff rates, and potential structural implications of the incorporation of roof level attenuation, it is not considered feasible to provide surface water attenuation on-Site as part of the Proposed Development. It is therefore intended that the Proposed Development, which will result only in a minor increase in the area of hardstanding on the Site, will seek to maintain the existing surface water runoff rate from the Site. This will therefore result in no increase to the volume or rate of surface water runoff and, in turn, will result in no additional burden on the existing surface drainage network. This will aid in mitigating the risk of flooding associated with sewer surcharge

- 8.9 A summary of the Proposed Development's assessment against the criteria of the drainage hierarchy is displayed in Table 8.3 below.

Table 8.3 Drainage Hierarchy Assessment

	Drainage Hierarchy	Site Context Assessment
1	Store rainwater for later use	Significant Site constraints limit storage potential above design attenuation volume.
2	Utilise infiltration techniques	Underlying Site geology comprises heavily consolidated London Clay and is not suitable for infiltration.
3	Attenuate rainwater in ponds or open water features	Nature of the Site, including its limited spatial area, limits opportunity for integrating surface water features.
4	Attenuate rainwater by storing in tanks or sealed water features	Significant Site constraints and the nature of the Proposed Development limit the potential to integrate storage within the Site boundaries, summarised as follows: • The Proposed Development is temporary in nature, with a proposed operational life of only five years. This limits opportunities to incorporate permanent drainage features. • The Site is extremely limited in spatial area, with the built form of the Proposed Development to occupy a large proportion of the Site area, as per the existing case. This limits opportunities to deliver significant surface water drainage features at the ground level, particularly those such as wetlands or large detention basins, which require large area of open space. • The limited area of the Site means that the existing and greenfield runoff rates are extremely low. These rates are below the minimum rate to which it is

	Drainage Hierarchy	Site Context Assessment
		recommended discharge from surface water drainage systems be restricted to. It is likely, therefore, that the risk of siltation within any surface water drainage features would be significant when seeking to maintain such a low rate of discharge, which would reduce the efficiency and effectiveness of the system. The lightweight nature of the portakabin building to be brought forward as part of the Proposed Development limits opportunities to incorporate roof-level attenuation systems. This is due to the fact that, with a void depth of up to approximately 100mm, the loading exerted by a system of this type can reach up to approximately 1.0kN/m².
5	Discharge water direct to a watercourse	No watercourse in close proximity to the Proposed Development, however it is noted that some surface water runoff generated on the Site in the existing case may be routed to the surface water feature present to the southwest. Should this be the case, it is expected that this would remain the case in the post-development context.
6	Discharge rainwater to a surface water sewer	Existing connections to the assumed surrounding drainage network are to be maintained. Discharge to this system will not be increased from the pre-development runoff rate.
7	Discharge rainwater to a combined sewer	

8.10 Based on the above, it can be said that there are significant constraints on the provision of on-Site attenuation to reduce the volume and rate of surface water runoff from the Proposed Development. It is therefore intended that, as the Proposed Development will not result in a significant increase to the footprint of the existing building, with only a minor increase in the area of hardstanding at the Site to arise, the existing surface water drainage system will be utilised in the post-development case, with the rate of surface water runoff from the Site not exceeding the existing rate. The table below shows the calculated post-development runoff rate, demonstrating that both the volume of surface water runoff generated, and the rate at which it is discharged from the Site, will remain as per the existing case in the post-development context. The full calculations are provided in Appendix A4.

Table 8.4 Post-Development surface water runoff rates for 6-hour storm

Return Period	Runoff Volume (l)	Runoff Rate (l/s)
Qbar	N/A	N/A
1 in 1 year (100% AEP)	32.5	1.5
1 in 30 year (3.33% AEP)	68.1	3.2
1 in 30 year (3.33% AEP) +40% CC	95.3	4.4
1 in 100 year (1% AEP)	88.4	4.1
1 in 100 year (1% AEP) + 40% CC	123.8	5.7

- 8.11 This analysis has fully considered the potential for utilising the Sustainable Drainage hierarchy within the Site. With the available information it has been demonstrated that providing on-Site attenuation is not feasible for the Proposed Development. It has been demonstrated, however, that as the Proposed Development will result only in a minor increase in the area of hardstanding on the Site, there will be no increase in the volume or rate of surface water runoff in the post-development context. Through the maintenance of the existing surface water runoff rate from the Site, there will be no additional burden on the existing drainage infrastructure, therefore mitigating any potential increase in the risk of flooding both on-Site and elsewhere within the catchment.

9. CONCLUSION

- 9.1 This report has analysed the flood risk associated with the Site arising from both natural and artificial sources. An outline surface water drainage assessment, outlining the proposed Sustainable Drainage System (SuDS) strategy best suited to the Site has also been presented.

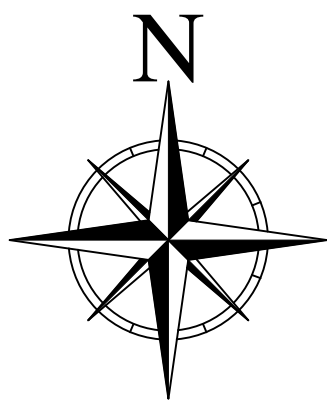
Flood Risk Assessment

- 9.2 This Flood Risk Assessment has concluded that the entire Site is located within Flood Zone 1. This suggests that there is less than 1 in 1,000 chance of flooding from fluvial or tidal sources on an annual basis.
- 9.3 In addition to this, information extracted from the Environment Agency Flood Maps, the West London Strategic Flood Risk Assessment (SFRA) and the London Borough of Hillingdon Surface Water Management Plan (SWMP), and the analysis undertaken in this assessment indicates that no sewer, groundwater or reservoir flood risk exists within the boundaries of the Site.
- 9.4 With respect to surface water flooding, it is demonstrated that the vast majority of the Site is at very low risk of flooding from this source. There are areas to the east and west of the Site, within the wider Uxbridge College campus, that are shown to be a low to high risk of flooding from this source. In particular, there is a pond / surface water feature located to the west of the Site, as well an area to the east of the Site, and which is located to the west of the existing West London Institute of Technology building, demonstrated to be at low to high risk of flooding from this source both in the present day and under the future climate change scenario. It is anticipated, however, that this risk will not encroach into the boundaries of the Site, which is shown to remain at very low risk of flooding from this source both in the present day, and under the future climate change scenario.
- 9.5 Furthermore, the Proposed Development will not result in a significant increase in the hardstanding area of the Site, seeking to largely mirror the footprint of the existing single-storey building. It is expected that the existing Site-specific characteristics, including the local topography, will ensure that, during periods of heavy rainfall, runoff will continue be channelled from the Site as per the existing case. Therefore, there will be no exacerbation of the risk of flooding from surface water sources either on the Site or in the immediate surroundings as a result of the Proposed Development.
- 9.6 It can therefore be concluded that, as the flood risk is considered to be low, or suitably mitigated from all sources, the proposed application is fit for purpose within the development site.

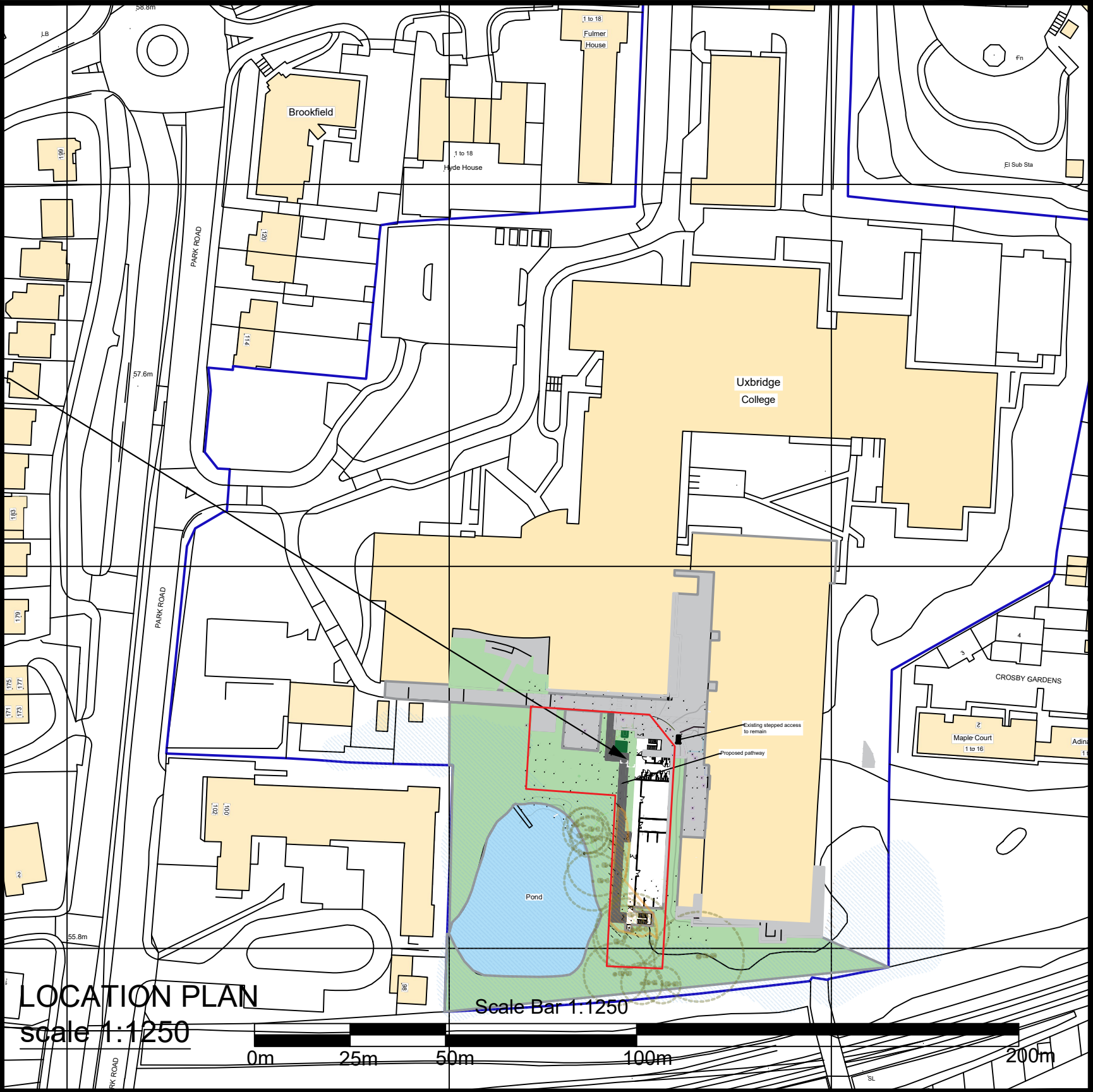
Surface Water Drainage

- 9.7 This report has provided an assessment of the most appropriate SuDS strategy for the Site, taking into account the constraints imposed by the nature of both the Site and the Proposed Development. Significant constraints present on the Site, combined with the nature of the Proposed Development, which seeks to replace the existing single-storey building with a three-storey building within largely the same footprint, and which will operate for a temporary period of only five years, limit the areas within which sustainable drainage features may be incorporated, and therefore the level of surface water attenuation that may be delivered as part of the Proposed Development. As the Proposed Development will not result in a significant increase in the footprint of the built-form at the Site, and only a minor increase in the area of hardstanding, it is considered that the Proposed Development will result in no additional burden on the existing drainage network. The risk of surface water flooding identified at the Site will remain low, as per the existing case, and the retaining of large areas of the existing soft landscaping at the Site will positively contribute to the management of the 5mm storm event runoff, and reduce runoff volume through the facilitation of interception and evapotranspiration.
- 9.8 Overall, there will be no increase in surface water runoff as a result of the Proposed Development, which will not result in a significant increase in the footprint of the built-form at the Site, and only a minor increase in the area of hardstanding, compared to the existing case. The delivery of the proposed Landscape Strategy, which will seek to retain large areas of the existing soft landscaping and vegetation at the Site, will aid the management of runoff arising from the 'everyday' storm. It is expected that, with only a minor increase to the hardstanding area of the Site and through the maintenance of soft landscaping, the Proposed Development will result in no change to the volume of surface water generated on the Site, nor the rate at which it is discharged. It is anticipated that the rate at which surface water runoff leaves the Site will remain as per the existing case in the post-development context. This will therefore mitigate potential any increase of the risk of surface water flooding both on the Site, and in the surrounding area, and therefore also mitigating the potential for an increased burden on the existing drainage network.

A1. SITE BOUNDARY AND AREA OF DEVELOPMENT



Proposed location of triple storey Portakabin Buildings.



© Crown Copyright 2025
Reproduction in whole or in part is prohibited without the prior permission of Ordnance Survey.

Portakabin®			
Title Proposed Location & Block Plan			
Uxbridge College at 0 Park Road Uxbridge UB8 1NQ			
Date: 19th August 2026			
Scale : 1:200 & 1:1250 @ A1			
Drawing Number UBC6789998212PNM			Rev F
Rev.	Date	Notes	

NOTES:

- Site plan is based on existing Ordnance Survey information
- Responsibility is not accepted for errors made by others in scaling from this drawing. Contractors must check all dimensions on site. Discrepancies must be reported to the drawing owner before proceeding.

KEY:

Application Boundary

Area owned by client but not in application

Existing tarmac

Proposed pathway (tarmac)

Existing Grass

Existing pond

Existing structures

Existing shrub/trees to remain

Existing Shrub to be cleared

Trees

A2. SURFACE WATER RUNOFF CALCULATIONS – PRE-DEVELOPMENT



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 1 yr Pre-Development Runoff Rates		
Title Hydrograph runoff calcs (Winter profile) for Uxbridge		

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 1

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 3.7mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 541 m²

Total area = 1455 m²

Total runoff = 32.5 m³

Peak flow = 3.76 l/s

Pervious area = 914 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 22.3 mm

Mean flow = 1.5 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	0.7	0.065	0.065
0.120	20.0	0.7	0.065	0.130
0.180	21.0	0.8	0.068	0.198
0.240	21.0	0.8	0.068	0.267
0.300	22.0	0.8	0.072	0.338
0.360	23.0	0.9	0.075	0.413
0.420	24.0	0.9	0.078	0.491
0.480	26.0	1.0	0.085	0.575
0.540	27.0	1.0	0.088	0.663
0.600	29.0	1.1	0.094	0.757
0.660	31.0	1.2	0.101	0.858
0.720	32.0	1.2	0.104	0.962
0.780	33.0	1.2	0.107	1.069
0.840	34.0	1.3	0.111	1.180
0.900	36.0	1.3	0.117	1.297
0.960	38.0	1.4	0.124	1.420
1.020	39.0	1.5	0.127	1.547
1.080	40.0	1.5	0.130	1.677
1.140	42.0	1.6	0.137	1.814
1.200	45.0	1.7	0.146	1.960
1.260	49.0	1.8	0.159	2.119
1.320	53.0	2.0	0.172	2.292
1.380	57.0	2.1	0.185	2.477
1.440	62.0	2.3	0.202	2.678
1.500	66.0	2.5	0.215	2.893
1.560	71.0	2.6	0.231	3.124
1.620	77.0	2.9	0.250	3.374
1.680	84.0	3.1	0.273	3.647
1.740	91.0	3.4	0.296	3.943
1.800	98.0	3.6	0.319	4.261
1.860	105.0	3.9	0.341	4.603
1.920	114.0	4.2	0.371	4.973
1.980	125.0	4.7	0.406	5.379
2.040	135.0	5.0	0.439	5.818
2.100	143.0	5.3	0.465	6.283
2.160	154.0	5.7	0.501	6.784
2.220	164.0	6.1	0.533	7.317



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 1 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	8.4	0.735	11.903
2.700	233.0	8.7	0.757	12.660
2.760	239.0	8.9	0.777	13.437
2.820	244.0	9.1	0.793	14.230
2.880	248.0	9.2	0.806	15.036
2.940	249.0	9.3	0.809	15.846
3.000	250.0	9.3	0.813	16.658
3.060	250.0	9.3	0.813	17.471
3.120	249.0	9.3	0.809	18.280
3.180	248.0	9.2	0.806	19.086
3.240	244.0	9.1	0.793	19.880
3.300	239.0	8.9	0.777	20.656
3.360	233.0	8.7	0.757	21.414
3.420	226.0	8.4	0.735	22.148
3.480	219.0	8.2	0.712	22.860
3.540	212.0	7.9	0.689	23.549
3.600	204.0	7.6	0.663	24.212
3.660	194.0	7.2	0.631	24.843
3.720	183.0	6.8	0.595	25.438
3.780	173.0	6.4	0.562	26.000
3.840	164.0	6.1	0.533	26.533
3.900	154.0	5.7	0.501	27.034
3.960	143.0	5.3	0.465	27.499
4.020	135.0	5.0	0.439	27.937
4.080	125.0	4.7	0.406	28.344
4.140	114.0	4.2	0.371	28.714
4.200	105.0	3.9	0.341	29.055
4.260	98.0	3.6	0.319	29.374
4.320	91.0	3.4	0.296	29.670
4.380	84.0	3.1	0.273	29.943
4.440	77.0	2.9	0.250	30.193
4.500	71.0	2.6	0.231	30.424
4.560	66.0	2.5	0.215	30.638
4.620	62.0	2.3	0.202	30.840
4.680	57.0	2.1	0.185	31.025
4.740	53.0	2.0	0.172	31.197
4.800	49.0	1.8	0.159	31.357
4.860	45.0	1.7	0.146	31.503
4.920	42.0	1.6	0.137	31.640
4.980	40.0	1.5	0.130	31.770
5.040	39.0	1.5	0.127	31.896
5.100	38.0	1.4	0.124	32.020
5.160	36.0	1.3	0.117	32.137
5.220	34.0	1.3	0.111	32.247
5.280	33.0	1.2	0.107	32.355
5.340	32.0	1.2	0.104	32.459
5.400	31.0	1.2	0.101	32.559
5.460	29.0	1.1	0.094	32.654
5.520	27.0	1.0	0.088	32.741
5.580	26.0	1.0	0.085	32.826
5.640	24.0	0.9	0.078	32.904
5.700	23.0	0.9	0.075	32.979
5.760	22.0	0.8	0.072	33.050
5.820	21.0	0.8	0.068	33.118
5.880	21.0	0.8	0.068	33.187
5.940	20.0	0.7	0.065	33.252
6.000	20.0	0.7	0.065	33.317



MasterDrain
SW

Iceni Projects

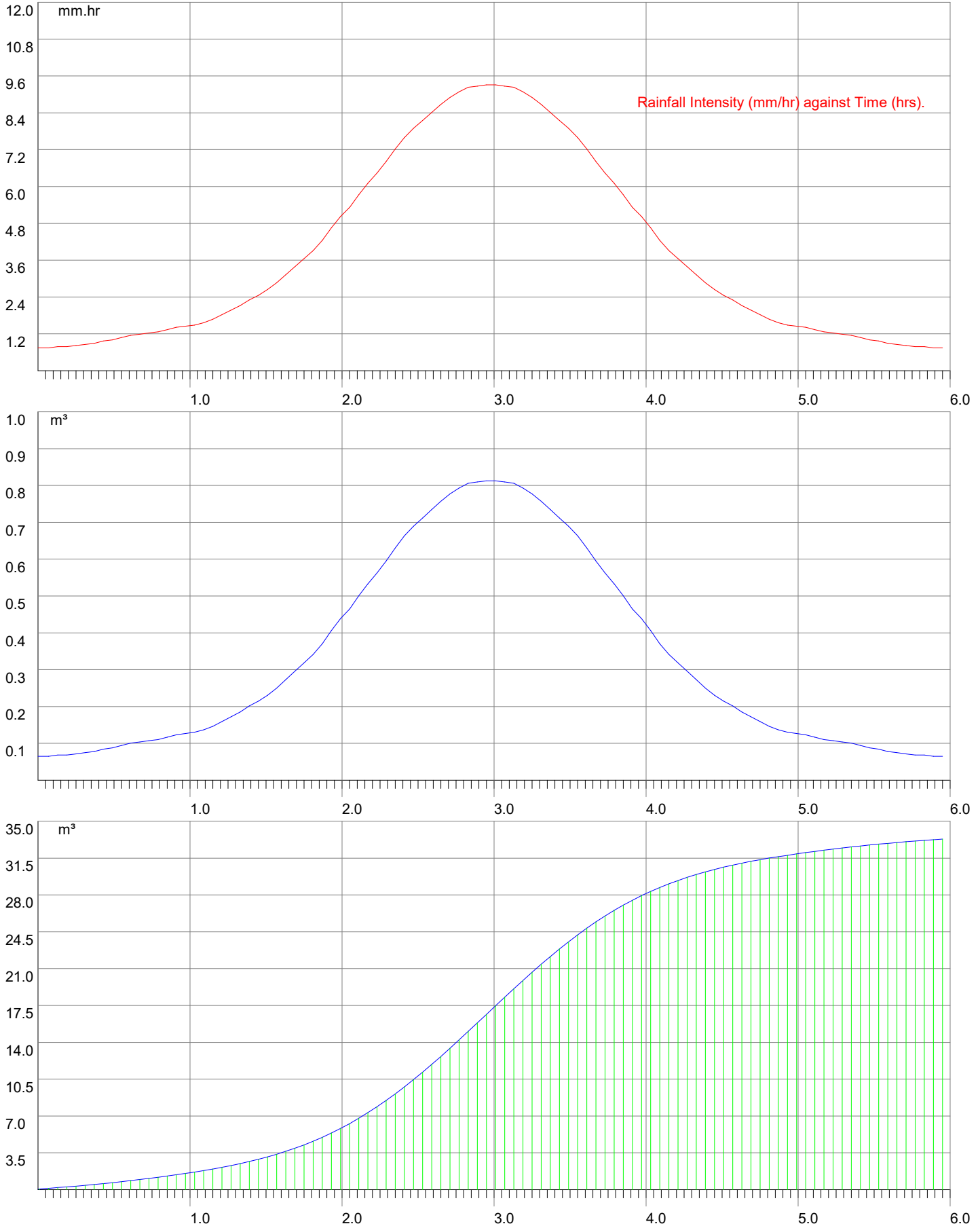
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No.	1003579		
Sheet no.	3		
Date	20/08/26		
By	GW	Checked	Reviewed
Title			

Project **Uxbridge College | 1 in 1 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 30

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 7.8mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 541 m²

Total area = 1455 m²

Total runoff = 68.1 m³

Peak flow = 7.88 l/s

Pervious area = 914 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 46.8 mm

Mean flow = 3.2 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	1.6	0.136	0.136
0.120	20.0	1.6	0.136	0.272
0.180	21.0	1.6	0.143	0.415
0.240	21.0	1.6	0.143	0.558
0.300	22.0	1.7	0.150	0.708
0.360	23.0	1.8	0.157	0.864
0.420	24.0	1.9	0.163	1.028
0.480	26.0	2.0	0.177	1.205
0.540	27.0	2.1	0.184	1.388
0.600	29.0	2.3	0.197	1.586
0.660	31.0	2.4	0.211	1.797
0.720	32.0	2.5	0.218	2.014
0.780	33.0	2.6	0.225	2.239
0.840	34.0	2.7	0.231	2.470
0.900	36.0	2.8	0.245	2.715
0.960	38.0	3.0	0.259	2.974
1.020	39.0	3.0	0.265	3.239
1.080	40.0	3.1	0.272	3.512
1.140	42.0	3.3	0.286	3.797
1.200	45.0	3.5	0.306	4.104
1.260	49.0	3.8	0.333	4.437
1.320	53.0	4.1	0.361	4.798
1.380	57.0	4.4	0.388	5.186
1.440	62.0	4.8	0.422	5.608
1.500	66.0	5.1	0.449	6.057
1.560	71.0	5.5	0.483	6.540
1.620	77.0	6.0	0.524	7.064
1.680	84.0	6.5	0.572	7.636
1.740	91.0	7.1	0.619	8.255
1.800	98.0	7.6	0.667	8.922
1.860	105.0	8.2	0.715	9.636
1.920	114.0	8.9	0.776	10.412
1.980	125.0	9.7	0.851	11.263
2.040	135.0	10.5	0.919	12.182
2.100	143.0	11.1	0.973	13.155
2.160	154.0	12.0	1.048	14.203
2.220	164.0	12.8	1.116	15.319



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	17.6	1.538	24.921
2.700	233.0	18.2	1.586	26.507
2.760	239.0	18.6	1.626	28.133
2.820	244.0	19.0	1.660	29.794
2.880	248.0	19.3	1.688	31.481
2.940	249.0	19.4	1.695	33.176
3.000	250.0	19.5	1.701	34.877
3.060	250.0	19.5	1.701	36.579
3.120	249.0	19.4	1.695	38.273
3.180	248.0	19.3	1.688	39.961
3.240	244.0	19.0	1.660	41.621
3.300	239.0	18.6	1.626	43.248
3.360	233.0	18.2	1.586	44.833
3.420	226.0	17.6	1.538	46.371
3.480	219.0	17.1	1.490	47.862
3.540	212.0	16.5	1.443	49.305
3.600	204.0	15.9	1.388	50.693
3.660	194.0	15.1	1.320	52.013
3.720	183.0	14.3	1.245	53.258
3.780	173.0	13.5	1.177	54.436
3.840	164.0	12.8	1.116	55.552
3.900	154.0	12.0	1.048	56.600
3.960	143.0	11.1	0.973	57.573
4.020	135.0	10.5	0.919	58.492
4.080	125.0	9.7	0.851	59.342
4.140	114.0	8.9	0.776	60.118
4.200	105.0	8.2	0.715	60.833
4.260	98.0	7.6	0.667	61.500
4.320	91.0	7.1	0.619	62.119
4.380	84.0	6.5	0.572	62.691
4.440	77.0	6.0	0.524	63.215
4.500	71.0	5.5	0.483	63.698
4.560	66.0	5.1	0.449	64.147
4.620	62.0	4.8	0.422	64.569
4.680	57.0	4.4	0.388	64.957
4.740	53.0	4.1	0.361	65.317
4.800	49.0	3.8	0.333	65.651
4.860	45.0	3.5	0.306	65.957
4.920	42.0	3.3	0.286	66.243
4.980	40.0	3.1	0.272	66.515
5.040	39.0	3.0	0.265	66.781
5.100	38.0	3.0	0.259	67.039
5.160	36.0	2.8	0.245	67.284
5.220	34.0	2.7	0.231	67.516
5.280	33.0	2.6	0.225	67.740
5.340	32.0	2.5	0.218	67.958
5.400	31.0	2.4	0.211	68.169
5.460	29.0	2.3	0.197	68.366
5.520	27.0	2.1	0.184	68.550
5.580	26.0	2.0	0.177	68.727
5.640	24.0	1.9	0.163	68.890
5.700	23.0	1.8	0.157	69.047
5.760	22.0	1.7	0.150	69.196
5.820	21.0	1.6	0.143	69.339
5.880	21.0	1.6	0.143	69.482
5.940	20.0	1.6	0.136	69.618
6.000	20.0	1.6	0.136	69.755



MasterDrain
SW

Iceni Projects

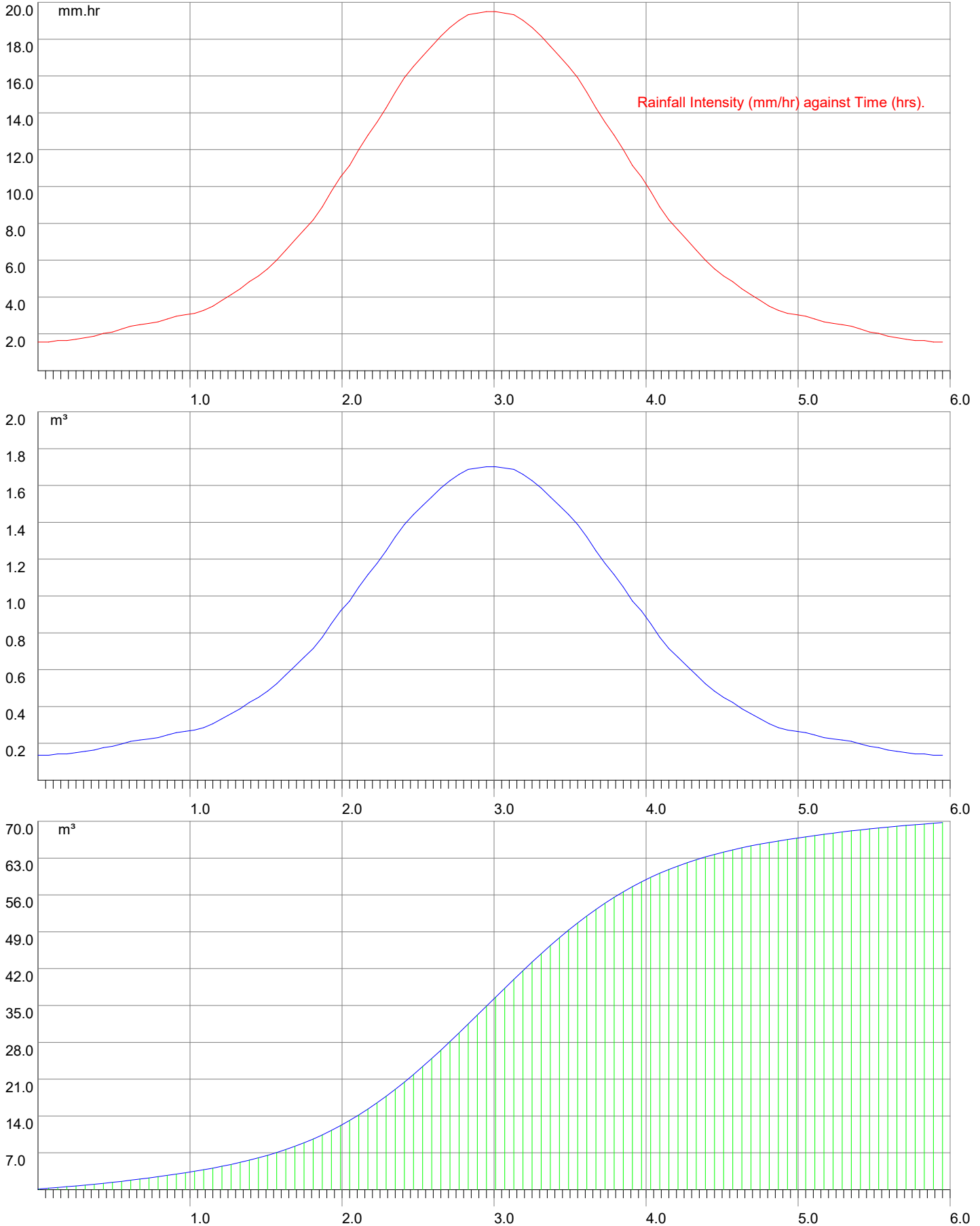
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 3		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 30 yr +40% CC Pre-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 30

Climate change factor = 40%

Location = UXBRIDGE

Mean intensity = 10.9mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 541 m²

Total area = 1455 m²

Total runoff = 95.3 m³

Peak flow = 11.03 l/s

Pervious area = 914 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 65.5 mm

Mean flow = 4.4 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.2	0.191	0.191
0.120	20.0	2.2	0.191	0.381
0.180	21.0	2.3	0.200	0.581
0.240	21.0	2.3	0.200	0.781
0.300	22.0	2.4	0.210	0.991
0.360	23.0	2.5	0.219	1.210
0.420	24.0	2.6	0.229	1.439
0.480	26.0	2.8	0.248	1.686
0.540	27.0	2.9	0.257	1.944
0.600	29.0	3.2	0.276	2.220
0.660	31.0	3.4	0.295	2.515
0.720	32.0	3.5	0.305	2.820
0.780	33.0	3.6	0.314	3.135
0.840	34.0	3.7	0.324	3.458
0.900	36.0	3.9	0.343	3.801
0.960	38.0	4.1	0.362	4.163
1.020	39.0	4.3	0.372	4.535
1.080	40.0	4.4	0.381	4.916
1.140	42.0	4.6	0.400	5.316
1.200	45.0	4.9	0.429	5.745
1.260	49.0	5.3	0.467	6.212
1.320	53.0	5.8	0.505	6.717
1.380	57.0	6.2	0.543	7.260
1.440	62.0	6.8	0.591	7.851
1.500	66.0	7.2	0.629	8.479
1.560	71.0	7.7	0.676	9.156
1.620	77.0	8.4	0.734	9.889
1.680	84.0	9.2	0.800	10.690
1.740	91.0	9.9	0.867	11.557
1.800	98.0	10.7	0.934	12.490
1.860	105.0	11.5	1.000	13.491
1.920	114.0	12.4	1.086	14.577
1.980	125.0	13.6	1.191	15.768
2.040	135.0	14.7	1.286	17.054
2.100	143.0	15.6	1.362	18.417
2.160	154.0	16.8	1.467	19.884
2.220	164.0	17.9	1.563	21.446



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 30 yr +40% CC Pre-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	24.7	2.153	34.889
2.700	233.0	25.4	2.220	37.109
2.760	239.0	26.1	2.277	39.386
2.820	244.0	26.6	2.325	41.711
2.880	248.0	27.1	2.363	44.074
2.940	249.0	27.2	2.372	46.446
3.000	250.0	27.3	2.382	48.828
3.060	250.0	27.3	2.382	51.210
3.120	249.0	27.2	2.372	53.582
3.180	248.0	27.1	2.363	55.945
3.240	244.0	26.6	2.325	58.270
3.300	239.0	26.1	2.277	60.547
3.360	233.0	25.4	2.220	62.767
3.420	226.0	24.7	2.153	64.920
3.480	219.0	23.9	2.087	67.006
3.540	212.0	23.1	2.020	69.026
3.600	204.0	22.3	1.944	70.970
3.660	194.0	21.2	1.848	72.818
3.720	183.0	20.0	1.744	74.562
3.780	173.0	18.9	1.648	76.210
3.840	164.0	17.9	1.563	77.772
3.900	154.0	16.8	1.467	79.240
3.960	143.0	15.6	1.362	80.602
4.020	135.0	14.7	1.286	81.888
4.080	125.0	13.6	1.191	83.079
4.140	114.0	12.4	1.086	84.165
4.200	105.0	11.5	1.000	85.166
4.260	98.0	10.7	0.934	86.099
4.320	91.0	9.9	0.867	86.966
4.380	84.0	9.2	0.800	87.767
4.440	77.0	8.4	0.734	88.500
4.500	71.0	7.7	0.676	89.177
4.560	66.0	7.2	0.629	89.806
4.620	62.0	6.8	0.591	90.396
4.680	57.0	6.2	0.543	90.939
4.740	53.0	5.8	0.505	91.444
4.800	49.0	5.3	0.467	91.911
4.860	45.0	4.9	0.429	92.340
4.920	42.0	4.6	0.400	92.740
4.980	40.0	4.4	0.381	93.121
5.040	39.0	4.3	0.372	93.493
5.100	38.0	4.1	0.362	93.855
5.160	36.0	3.9	0.343	94.198
5.220	34.0	3.7	0.324	94.522
5.280	33.0	3.6	0.314	94.836
5.340	32.0	3.5	0.305	95.141
5.400	31.0	3.4	0.295	95.436
5.460	29.0	3.2	0.276	95.713
5.520	27.0	2.9	0.257	95.970
5.580	26.0	2.8	0.248	96.218
5.640	24.0	2.6	0.229	96.446
5.700	23.0	2.5	0.219	96.665
5.760	22.0	2.4	0.210	96.875
5.820	21.0	2.3	0.200	97.075
5.880	21.0	2.3	0.200	97.275
5.940	20.0	2.2	0.191	97.466
6.000	20.0	2.2	0.191	97.656



MasterDrain
SW

Iceni Projects

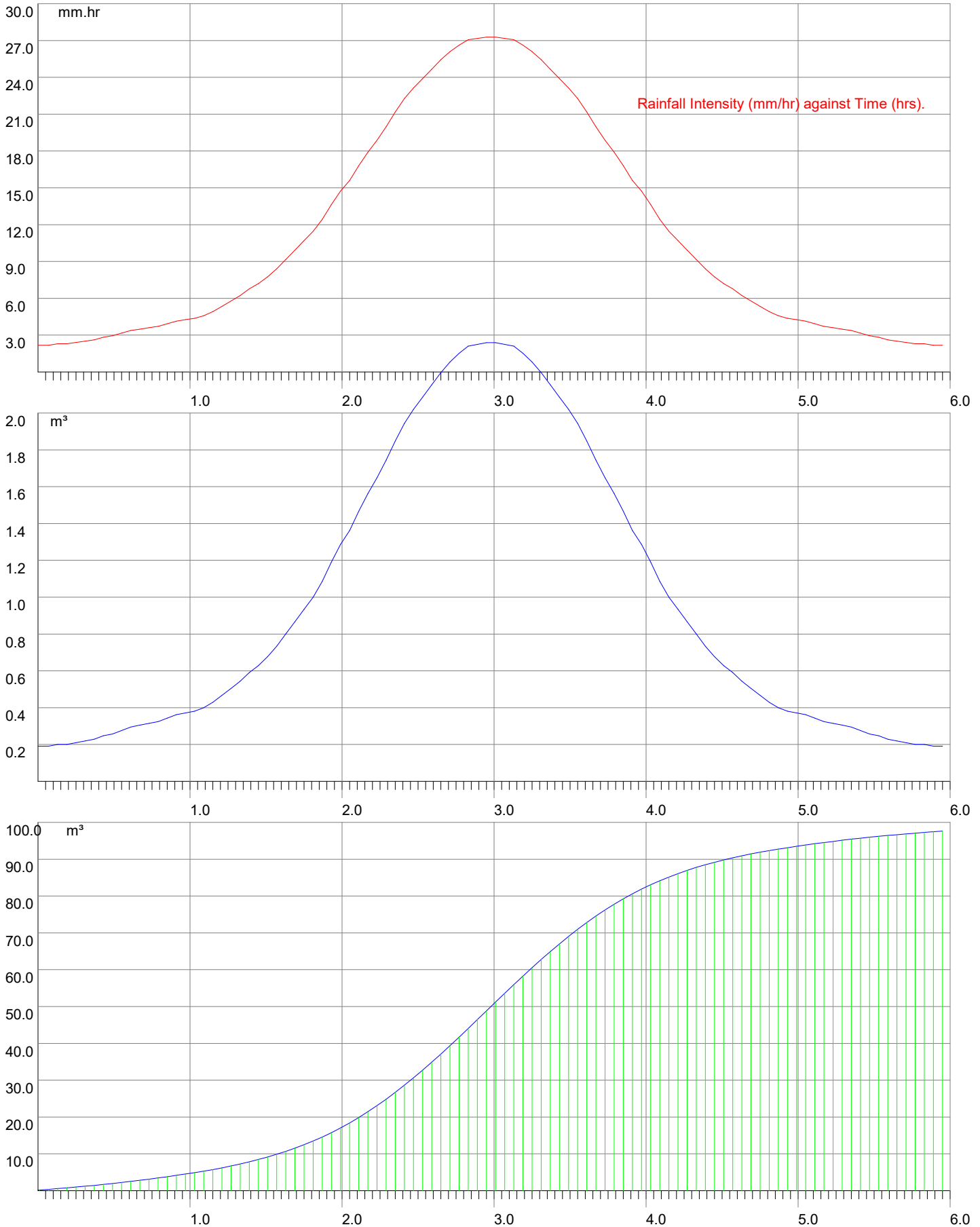
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No.	1003579		
Sheet no.	3		
Date	20/08/26		
By	GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr +40% CC Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr Pre-Development Runoff Rates		
Title Hydrograph runoff calcs (Winter profile) for Uxbridge		

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 100

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 10.1mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 541 m²

Total area = 1455 m²

Total runoff = 88.4 m³

Peak flow = 10.23 l/s

Pervious area = 914 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 60.8 mm

Mean flow = 4.1 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.0	0.177	0.177
0.120	20.0	2.0	0.177	0.354
0.180	21.0	2.1	0.186	0.539
0.240	21.0	2.1	0.186	0.725
0.300	22.0	2.2	0.194	0.919
0.360	23.0	2.3	0.203	1.123
0.420	24.0	2.4	0.212	1.335
0.480	26.0	2.6	0.230	1.565
0.540	27.0	2.7	0.239	1.803
0.600	29.0	2.9	0.256	2.060
0.660	31.0	3.1	0.274	2.334
0.720	32.0	3.2	0.283	2.617
0.780	33.0	3.3	0.292	2.908
0.840	34.0	3.4	0.301	3.209
0.900	36.0	3.6	0.318	3.527
0.960	38.0	3.8	0.336	3.863
1.020	39.0	3.9	0.345	4.208
1.080	40.0	4.1	0.354	4.561
1.140	42.0	4.3	0.371	4.933
1.200	45.0	4.6	0.398	5.330
1.260	49.0	5.0	0.433	5.764
1.320	53.0	5.4	0.469	6.232
1.380	57.0	5.8	0.504	6.736
1.440	62.0	6.3	0.548	7.284
1.500	66.0	6.7	0.583	7.867
1.560	71.0	7.2	0.628	8.495
1.620	77.0	7.8	0.681	9.176
1.680	84.0	8.5	0.743	9.918
1.740	91.0	9.2	0.804	10.723
1.800	98.0	9.9	0.866	11.589
1.860	105.0	10.6	0.928	12.517
1.920	114.0	11.5	1.008	13.525
1.980	125.0	12.7	1.105	14.630
2.040	135.0	13.7	1.193	15.823
2.100	143.0	14.5	1.264	17.087
2.160	154.0	15.6	1.361	18.449
2.220	164.0	16.6	1.450	19.899



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr Pre-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	22.9	1.998	32.372
2.700	233.0	23.6	2.060	34.431
2.760	239.0	24.2	2.113	36.544
2.820	244.0	24.7	2.157	38.701
2.880	248.0	25.1	2.192	40.893
2.940	249.0	25.2	2.201	43.094
3.000	250.0	25.3	2.210	45.304
3.060	250.0	25.3	2.210	47.514
3.120	249.0	25.2	2.201	49.715
3.180	248.0	25.1	2.192	51.908
3.240	244.0	24.7	2.157	54.065
3.300	239.0	24.2	2.113	56.177
3.360	233.0	23.6	2.060	58.237
3.420	226.0	22.9	1.998	60.235
3.480	219.0	22.2	1.936	62.171
3.540	212.0	21.5	1.874	64.045
3.600	204.0	20.7	1.803	65.848
3.660	194.0	19.6	1.715	67.563
3.720	183.0	18.5	1.618	69.181
3.780	173.0	17.5	1.529	70.710
3.840	164.0	16.6	1.450	72.160
3.900	154.0	15.6	1.361	73.521
3.960	143.0	14.5	1.264	74.785
4.020	135.0	13.7	1.193	75.979
4.080	125.0	12.7	1.105	77.084
4.140	114.0	11.5	1.008	78.091
4.200	105.0	10.6	0.928	79.020
4.260	98.0	9.9	0.866	79.886
4.320	91.0	9.2	0.804	80.690
4.380	84.0	8.5	0.743	81.433
4.440	77.0	7.8	0.681	82.113
4.500	71.0	7.2	0.628	82.741
4.560	66.0	6.7	0.583	83.325
4.620	62.0	6.3	0.548	83.873
4.680	57.0	5.8	0.504	84.376
4.740	53.0	5.4	0.469	84.845
4.800	49.0	5.0	0.433	85.278
4.860	45.0	4.6	0.398	85.676
4.920	42.0	4.3	0.371	86.047
4.980	40.0	4.1	0.354	86.401
5.040	39.0	3.9	0.345	86.746
5.100	38.0	3.8	0.336	87.081
5.160	36.0	3.6	0.318	87.400
5.220	34.0	3.4	0.301	87.700
5.280	33.0	3.3	0.292	87.992
5.340	32.0	3.2	0.283	88.275
5.400	31.0	3.1	0.274	88.549
5.460	29.0	2.9	0.256	88.805
5.520	27.0	2.7	0.239	89.044
5.580	26.0	2.6	0.230	89.274
5.640	24.0	2.4	0.212	89.486
5.700	23.0	2.3	0.203	89.689
5.760	22.0	2.2	0.194	89.884
5.820	21.0	2.1	0.186	90.069
5.880	21.0	2.1	0.186	90.255
5.940	20.0	2.0	0.177	90.432
6.000	20.0	2.0	0.177	90.609



MasterDrain
SW

Iceni Projects

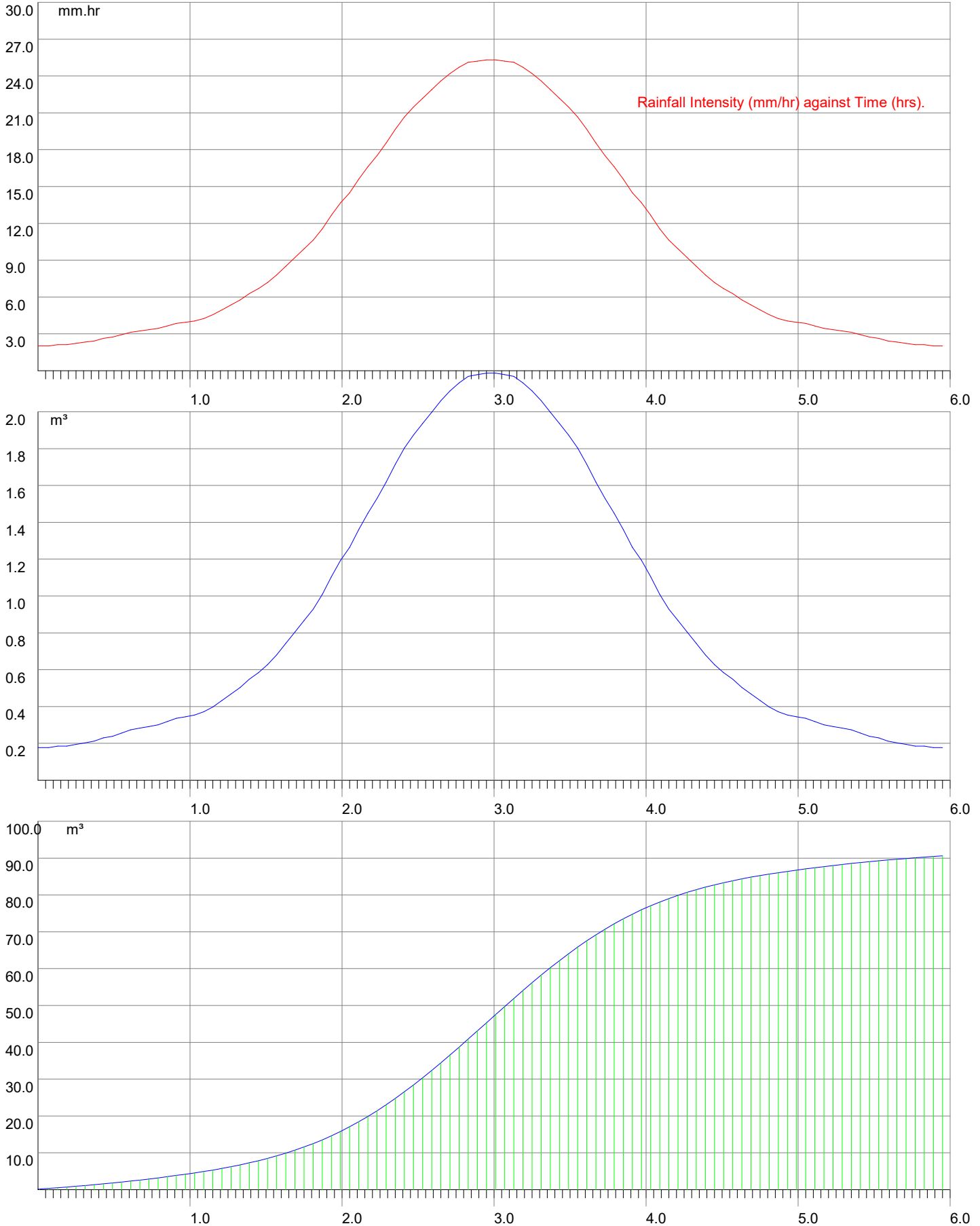
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 3		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 100 yr Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr +40% CC Pre-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 100

Climate change factor = 40%

Location = UXBRIDGE

Mean intensity = 14.2mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 541 m²

Total area = 1455 m²

Total runoff = 123.8 m³

Peak flow = 14.32 l/s

Pervious area = 914 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 85.1 mm

Mean flow = 5.7 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.8	0.248	0.248
0.120	20.0	2.8	0.248	0.495
0.180	21.0	3.0	0.260	0.755
0.240	21.0	3.0	0.260	1.015
0.300	22.0	3.1	0.272	1.287
0.360	23.0	3.3	0.285	1.572
0.420	24.0	3.4	0.297	1.869
0.480	26.0	3.7	0.322	2.191
0.540	27.0	3.8	0.334	2.525
0.600	29.0	4.1	0.359	2.884
0.660	31.0	4.4	0.384	3.267
0.720	32.0	4.5	0.396	3.663
0.780	33.0	4.7	0.408	4.072
0.840	34.0	4.8	0.421	4.492
0.900	36.0	5.1	0.446	4.938
0.960	38.0	5.4	0.470	5.408
1.020	39.0	5.5	0.483	5.891
1.080	40.0	5.7	0.495	6.386
1.140	42.0	6.0	0.520	6.906
1.200	45.0	6.4	0.557	7.463
1.260	49.0	6.9	0.606	8.069
1.320	53.0	7.5	0.656	8.725
1.380	57.0	8.1	0.705	9.430
1.440	62.0	8.8	0.767	10.198
1.500	66.0	9.4	0.817	11.014
1.560	71.0	10.1	0.879	11.893
1.620	77.0	10.9	0.953	12.846
1.680	84.0	11.9	1.040	13.886
1.740	91.0	12.9	1.126	15.012
1.800	98.0	13.9	1.213	16.225
1.860	105.0	14.9	1.299	17.524
1.920	114.0	16.2	1.411	18.935
1.980	125.0	17.7	1.547	20.482
2.040	135.0	19.1	1.671	22.153
2.100	143.0	20.3	1.770	23.922
2.160	154.0	21.8	1.906	25.828
2.220	164.0	23.2	2.030	27.858



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr +40% CC Pre-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	32.0	2.797	45.320
2.700	233.0	33.0	2.884	48.204
2.760	239.0	33.9	2.958	51.162
2.820	244.0	34.6	3.020	54.181
2.880	248.0	35.2	3.069	57.250
2.940	249.0	35.3	3.082	60.332
3.000	250.0	35.4	3.094	63.426
3.060	250.0	35.4	3.094	66.520
3.120	249.0	35.3	3.082	69.602
3.180	248.0	35.2	3.069	72.671
3.240	244.0	34.6	3.020	75.690
3.300	239.0	33.9	2.958	78.648
3.360	233.0	33.0	2.884	81.532
3.420	226.0	32.0	2.797	84.329
3.480	219.0	31.0	2.710	87.039
3.540	212.0	30.1	2.624	89.663
3.600	204.0	28.9	2.525	92.187
3.660	194.0	27.5	2.401	94.588
3.720	183.0	25.9	2.265	96.853
3.780	173.0	24.5	2.141	98.994
3.840	164.0	23.2	2.030	101.024
3.900	154.0	21.8	1.906	102.930
3.960	143.0	20.3	1.770	104.699
4.020	135.0	19.1	1.671	106.370
4.080	125.0	17.7	1.547	107.917
4.140	114.0	16.2	1.411	109.328
4.200	105.0	14.9	1.299	110.627
4.260	98.0	13.9	1.213	111.840
4.320	91.0	12.9	1.126	112.966
4.380	84.0	11.9	1.040	114.006
4.440	77.0	10.9	0.953	114.959
4.500	71.0	10.1	0.879	115.838
4.560	66.0	9.4	0.817	116.654
4.620	62.0	8.8	0.767	117.422
4.680	57.0	8.1	0.705	118.127
4.740	53.0	7.5	0.656	118.783
4.800	49.0	6.9	0.606	119.389
4.860	45.0	6.4	0.557	119.946
4.920	42.0	6.0	0.520	120.466
4.980	40.0	5.7	0.495	120.961
5.040	39.0	5.5	0.483	121.444
5.100	38.0	5.4	0.470	121.914
5.160	36.0	5.1	0.446	122.360
5.220	34.0	4.8	0.421	122.780
5.280	33.0	4.7	0.408	123.189
5.340	32.0	4.5	0.396	123.585
5.400	31.0	4.4	0.384	123.968
5.460	29.0	4.1	0.359	124.327
5.520	27.0	3.8	0.334	124.661
5.580	26.0	3.7	0.322	124.983
5.640	24.0	3.4	0.297	125.280
5.700	23.0	3.3	0.285	125.565
5.760	22.0	3.1	0.272	125.837
5.820	21.0	3.0	0.260	126.097
5.880	21.0	3.0	0.260	126.357
5.940	20.0	2.8	0.248	126.604
6.000	20.0	2.8	0.248	126.852



MasterDrain
SW

Iceni Projects

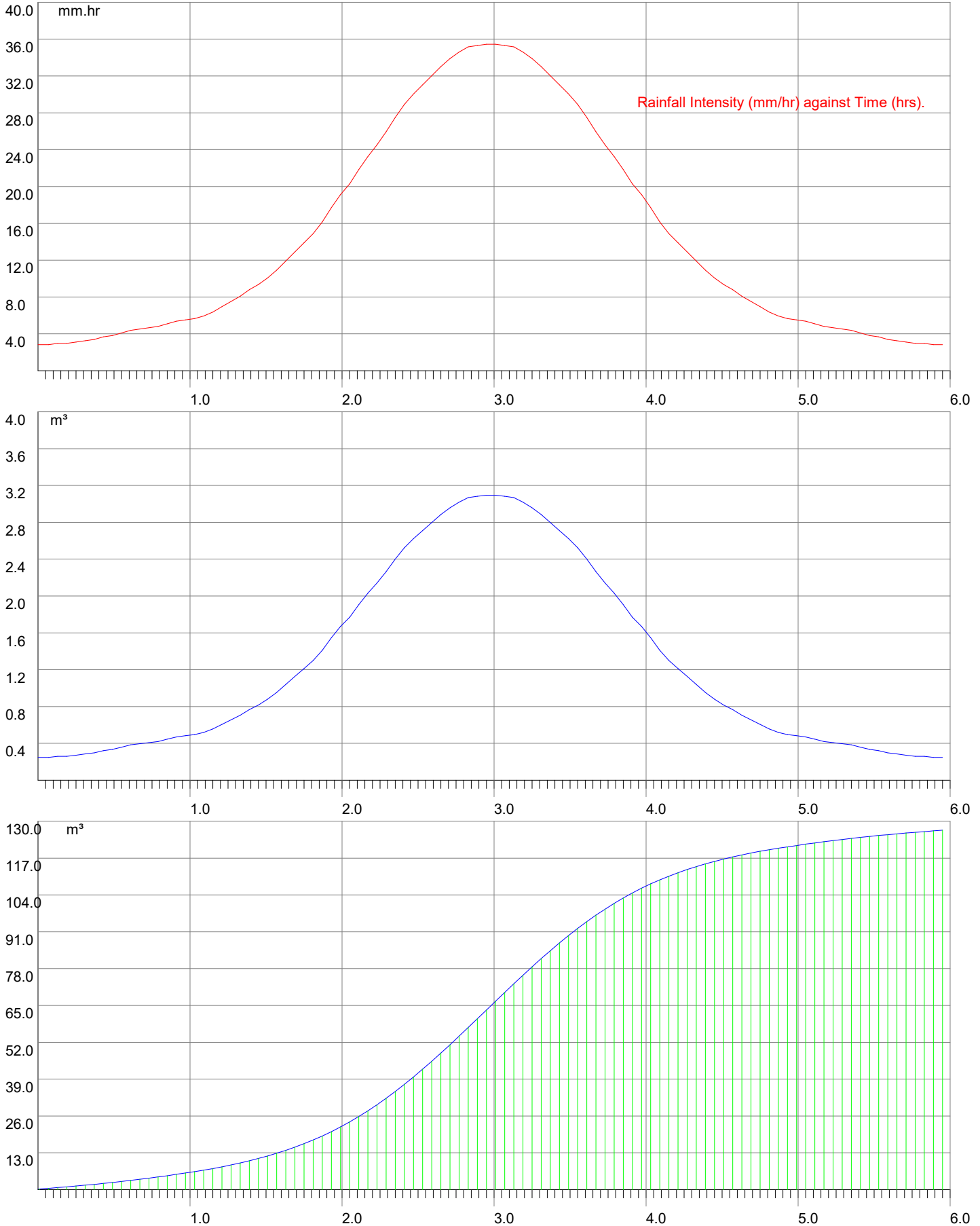
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 3		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 100 yr +40% CC Pre-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**



A3. SURFACE WATER RUNOFF CALCULATIONS – GREENFIELD

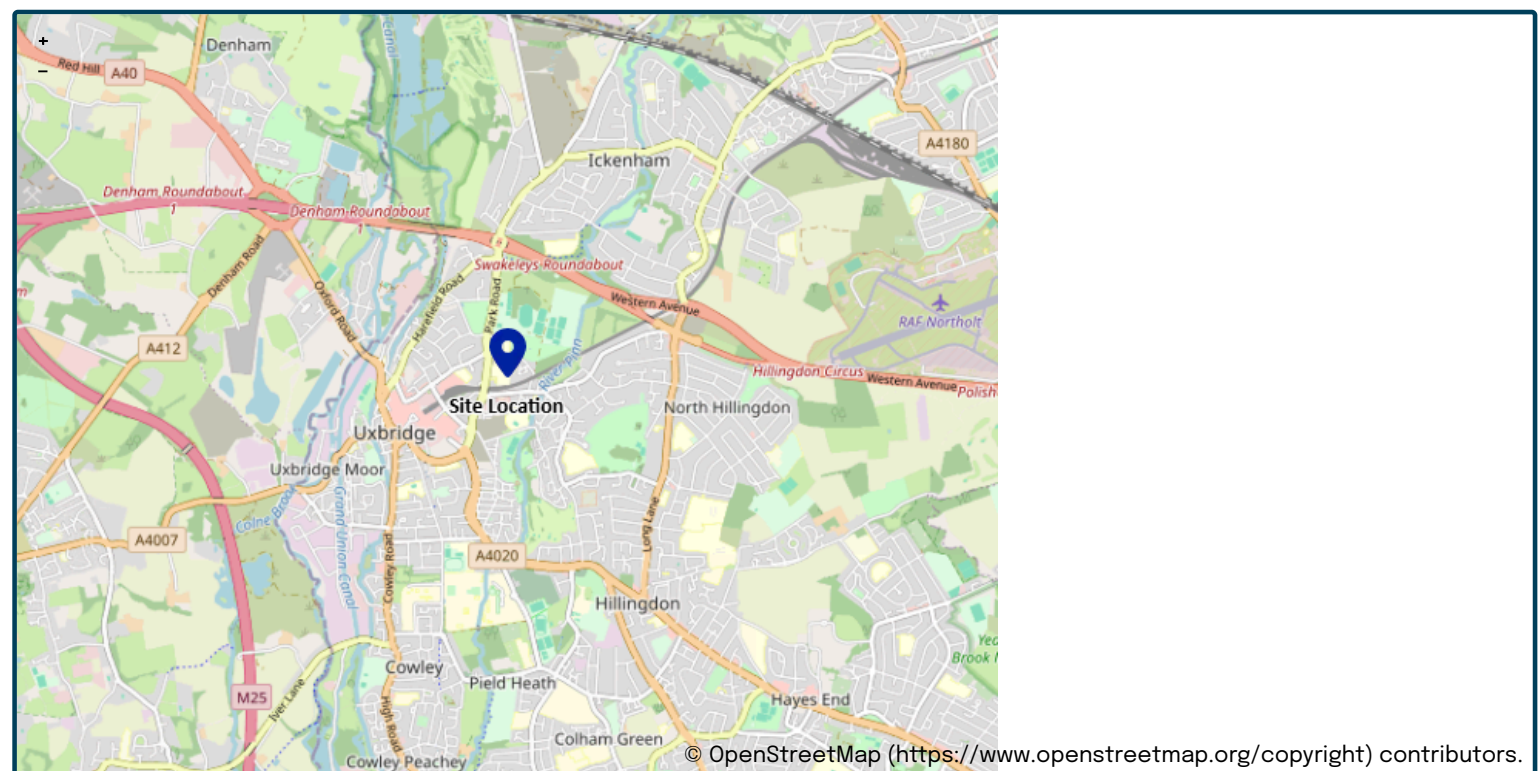
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	20/08/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	
Site location	



Site easting (British National Grid)	506292
Site northing (British National Grid)	184270

Site details

Total site area (ha)	0.1455	ha
----------------------	-------------------------------------	----

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

OK, I AGREE

MORE INFO

Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	634	mm	634
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.6	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	6		6
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	IH124	
Flow rate 1 year (l/s)	0.5	l/s
Flow rate 2 year (l/s)	0.6	l/s
Flow rate 10 years (l/s)	1.0	l/s
Flow rate 30 years (l/s)	1.4	l/s
Flow rate 100 years (l/s)	2.0	l/s
Flow rate 200 years (l/s)	2.3	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

A4. SURFACE WATER RUNOFF CALCULATIONS – POST-DEVELOPMENT



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 1 yr Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 1

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 3.7mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 895 m²

Total area = 1455 m²

Total runoff = 32.5 m³

Peak flow = 3.76 l/s

Pervious area = 560 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 22.3 mm

Mean flow = 1.5 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	0.7	0.065	0.065
0.120	20.0	0.7	0.065	0.130
0.180	21.0	0.8	0.068	0.198
0.240	21.0	0.8	0.068	0.267
0.300	22.0	0.8	0.072	0.338
0.360	23.0	0.9	0.075	0.413
0.420	24.0	0.9	0.078	0.491
0.480	26.0	1.0	0.085	0.575
0.540	27.0	1.0	0.088	0.663
0.600	29.0	1.1	0.094	0.757
0.660	31.0	1.2	0.101	0.858
0.720	32.0	1.2	0.104	0.962
0.780	33.0	1.2	0.107	1.069
0.840	34.0	1.3	0.111	1.180
0.900	36.0	1.3	0.117	1.297
0.960	38.0	1.4	0.124	1.420
1.020	39.0	1.5	0.127	1.547
1.080	40.0	1.5	0.130	1.677
1.140	42.0	1.6	0.137	1.814
1.200	45.0	1.7	0.146	1.960
1.260	49.0	1.8	0.159	2.119
1.320	53.0	2.0	0.172	2.292
1.380	57.0	2.1	0.185	2.477
1.440	62.0	2.3	0.202	2.678
1.500	66.0	2.5	0.215	2.893
1.560	71.0	2.6	0.231	3.124
1.620	77.0	2.9	0.250	3.374
1.680	84.0	3.1	0.273	3.647
1.740	91.0	3.4	0.296	3.943
1.800	98.0	3.6	0.319	4.261
1.860	105.0	3.9	0.341	4.603
1.920	114.0	4.2	0.371	4.973
1.980	125.0	4.7	0.406	5.379
2.040	135.0	5.0	0.439	5.818
2.100	143.0	5.3	0.465	6.283
2.160	154.0	5.7	0.501	6.784
2.220	164.0	6.1	0.533	7.317



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 1 yr Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	8.4	0.735	11.903
2.700	233.0	8.7	0.757	12.660
2.760	239.0	8.9	0.777	13.437
2.820	244.0	9.1	0.793	14.230
2.880	248.0	9.2	0.806	15.036
2.940	249.0	9.3	0.809	15.846
3.000	250.0	9.3	0.813	16.658
3.060	250.0	9.3	0.813	17.471
3.120	249.0	9.3	0.809	18.280
3.180	248.0	9.2	0.806	19.086
3.240	244.0	9.1	0.793	19.880
3.300	239.0	8.9	0.777	20.656
3.360	233.0	8.7	0.757	21.414
3.420	226.0	8.4	0.735	22.148
3.480	219.0	8.2	0.712	22.860
3.540	212.0	7.9	0.689	23.549
3.600	204.0	7.6	0.663	24.212
3.660	194.0	7.2	0.631	24.843
3.720	183.0	6.8	0.595	25.438
3.780	173.0	6.4	0.562	26.000
3.840	164.0	6.1	0.533	26.533
3.900	154.0	5.7	0.501	27.034
3.960	143.0	5.3	0.465	27.499
4.020	135.0	5.0	0.439	27.937
4.080	125.0	4.7	0.406	28.344
4.140	114.0	4.2	0.371	28.714
4.200	105.0	3.9	0.341	29.055
4.260	98.0	3.6	0.319	29.374
4.320	91.0	3.4	0.296	29.670
4.380	84.0	3.1	0.273	29.943
4.440	77.0	2.9	0.250	30.193
4.500	71.0	2.6	0.231	30.424
4.560	66.0	2.5	0.215	30.638
4.620	62.0	2.3	0.202	30.840
4.680	57.0	2.1	0.185	31.025
4.740	53.0	2.0	0.172	31.197
4.800	49.0	1.8	0.159	31.357
4.860	45.0	1.7	0.146	31.503
4.920	42.0	1.6	0.137	31.640
4.980	40.0	1.5	0.130	31.770
5.040	39.0	1.5	0.127	31.896
5.100	38.0	1.4	0.124	32.020
5.160	36.0	1.3	0.117	32.137
5.220	34.0	1.3	0.111	32.247
5.280	33.0	1.2	0.107	32.355
5.340	32.0	1.2	0.104	32.459
5.400	31.0	1.2	0.101	32.559
5.460	29.0	1.1	0.094	32.654
5.520	27.0	1.0	0.088	32.741
5.580	26.0	1.0	0.085	32.826
5.640	24.0	0.9	0.078	32.904
5.700	23.0	0.9	0.075	32.979
5.760	22.0	0.8	0.072	33.050
5.820	21.0	0.8	0.068	33.118
5.880	21.0	0.8	0.068	33.187
5.940	20.0	0.7	0.065	33.252
6.000	20.0	0.7	0.065	33.317



MasterDrain
SW

Iceni Projects

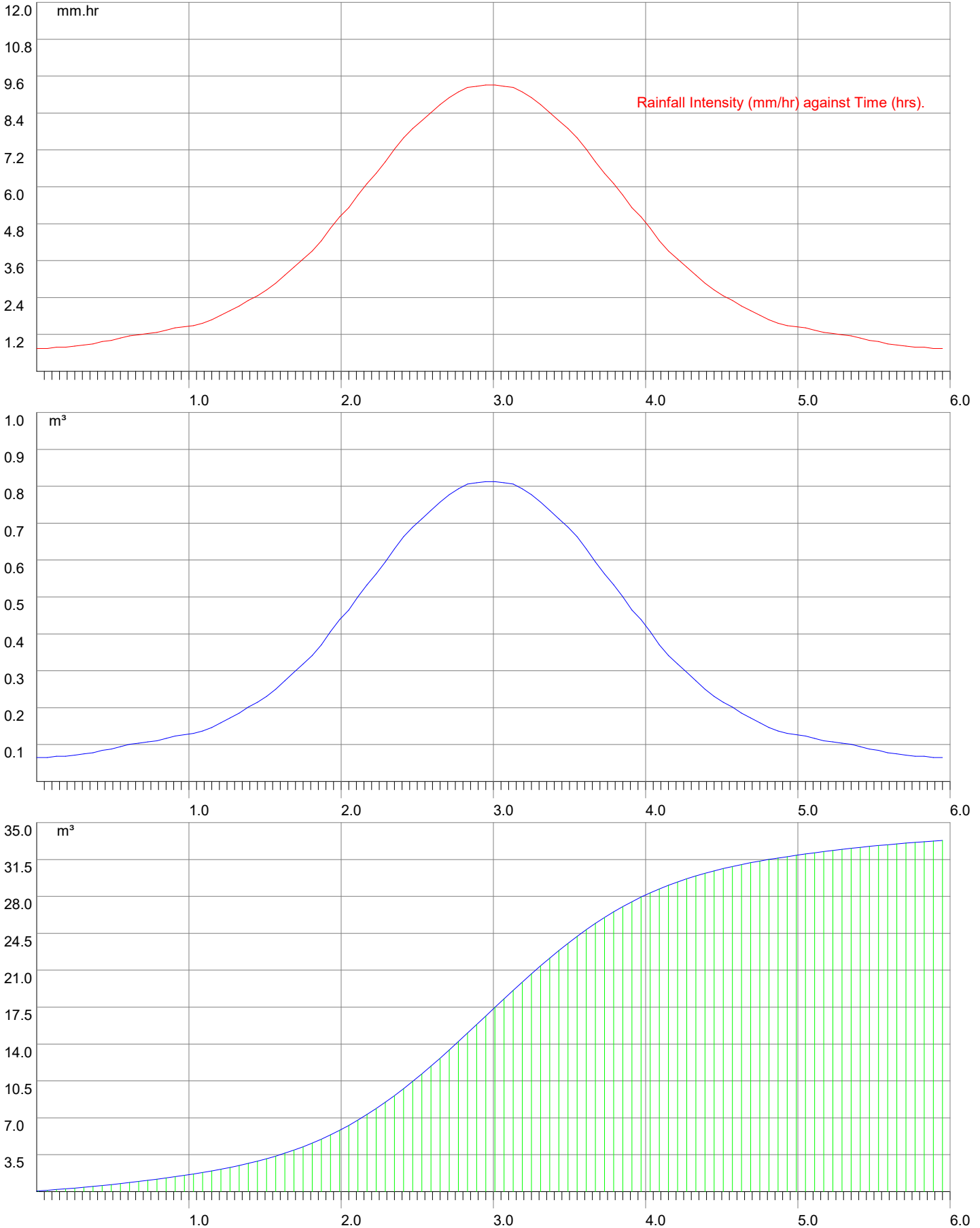
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No.	1003579		
Sheet no.	3		
Date	20/08/26		
By	GW	Checked	Reviewed
Title			

Project **Uxbridge College | 1 in 1 yr Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 30

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 7.8mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 895 m²

Total area = 1455 m²

Total runoff = 68.1 m³

Peak flow = 7.88 l/s

Pervious area = 560 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 46.8 mm

Mean flow = 3.2 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	1.6	0.136	0.136
0.120	20.0	1.6	0.136	0.272
0.180	21.0	1.6	0.143	0.415
0.240	21.0	1.6	0.143	0.558
0.300	22.0	1.7	0.150	0.708
0.360	23.0	1.8	0.157	0.864
0.420	24.0	1.9	0.163	1.028
0.480	26.0	2.0	0.177	1.205
0.540	27.0	2.1	0.184	1.388
0.600	29.0	2.3	0.197	1.586
0.660	31.0	2.4	0.211	1.797
0.720	32.0	2.5	0.218	2.014
0.780	33.0	2.6	0.225	2.239
0.840	34.0	2.7	0.231	2.470
0.900	36.0	2.8	0.245	2.715
0.960	38.0	3.0	0.259	2.974
1.020	39.0	3.0	0.265	3.239
1.080	40.0	3.1	0.272	3.512
1.140	42.0	3.3	0.286	3.797
1.200	45.0	3.5	0.306	4.104
1.260	49.0	3.8	0.333	4.437
1.320	53.0	4.1	0.361	4.798
1.380	57.0	4.4	0.388	5.186
1.440	62.0	4.8	0.422	5.608
1.500	66.0	5.1	0.449	6.057
1.560	71.0	5.5	0.483	6.540
1.620	77.0	6.0	0.524	7.064
1.680	84.0	6.5	0.572	7.636
1.740	91.0	7.1	0.619	8.255
1.800	98.0	7.6	0.667	8.922
1.860	105.0	8.2	0.715	9.636
1.920	114.0	8.9	0.776	10.412
1.980	125.0	9.7	0.851	11.263
2.040	135.0	10.5	0.919	12.182
2.100	143.0	11.1	0.973	13.155
2.160	154.0	12.0	1.048	14.203
2.220	164.0	12.8	1.116	15.319



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 30 yr Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	17.6	1.538	24.921
2.700	233.0	18.2	1.586	26.507
2.760	239.0	18.6	1.626	28.133
2.820	244.0	19.0	1.660	29.794
2.880	248.0	19.3	1.688	31.481
2.940	249.0	19.4	1.695	33.176
3.000	250.0	19.5	1.701	34.877
3.060	250.0	19.5	1.701	36.579
3.120	249.0	19.4	1.695	38.273
3.180	248.0	19.3	1.688	39.961
3.240	244.0	19.0	1.660	41.621
3.300	239.0	18.6	1.626	43.248
3.360	233.0	18.2	1.586	44.833
3.420	226.0	17.6	1.538	46.371
3.480	219.0	17.1	1.490	47.862
3.540	212.0	16.5	1.443	49.305
3.600	204.0	15.9	1.388	50.693
3.660	194.0	15.1	1.320	52.013
3.720	183.0	14.3	1.245	53.258
3.780	173.0	13.5	1.177	54.436
3.840	164.0	12.8	1.116	55.552
3.900	154.0	12.0	1.048	56.600
3.960	143.0	11.1	0.973	57.573
4.020	135.0	10.5	0.919	58.492
4.080	125.0	9.7	0.851	59.342
4.140	114.0	8.9	0.776	60.118
4.200	105.0	8.2	0.715	60.833
4.260	98.0	7.6	0.667	61.500
4.320	91.0	7.1	0.619	62.119
4.380	84.0	6.5	0.572	62.691
4.440	77.0	6.0	0.524	63.215
4.500	71.0	5.5	0.483	63.698
4.560	66.0	5.1	0.449	64.147
4.620	62.0	4.8	0.422	64.569
4.680	57.0	4.4	0.388	64.957
4.740	53.0	4.1	0.361	65.317
4.800	49.0	3.8	0.333	65.651
4.860	45.0	3.5	0.306	65.957
4.920	42.0	3.3	0.286	66.243
4.980	40.0	3.1	0.272	66.515
5.040	39.0	3.0	0.265	66.781
5.100	38.0	3.0	0.259	67.039
5.160	36.0	2.8	0.245	67.284
5.220	34.0	2.7	0.231	67.516
5.280	33.0	2.6	0.225	67.740
5.340	32.0	2.5	0.218	67.958
5.400	31.0	2.4	0.211	68.169
5.460	29.0	2.3	0.197	68.366
5.520	27.0	2.1	0.184	68.550
5.580	26.0	2.0	0.177	68.727
5.640	24.0	1.9	0.163	68.890
5.700	23.0	1.8	0.157	69.047
5.760	22.0	1.7	0.150	69.196
5.820	21.0	1.6	0.143	69.339
5.880	21.0	1.6	0.143	69.482
5.940	20.0	1.6	0.136	69.618
6.000	20.0	1.6	0.136	69.755



MasterDrain
SW

Iceni Projects

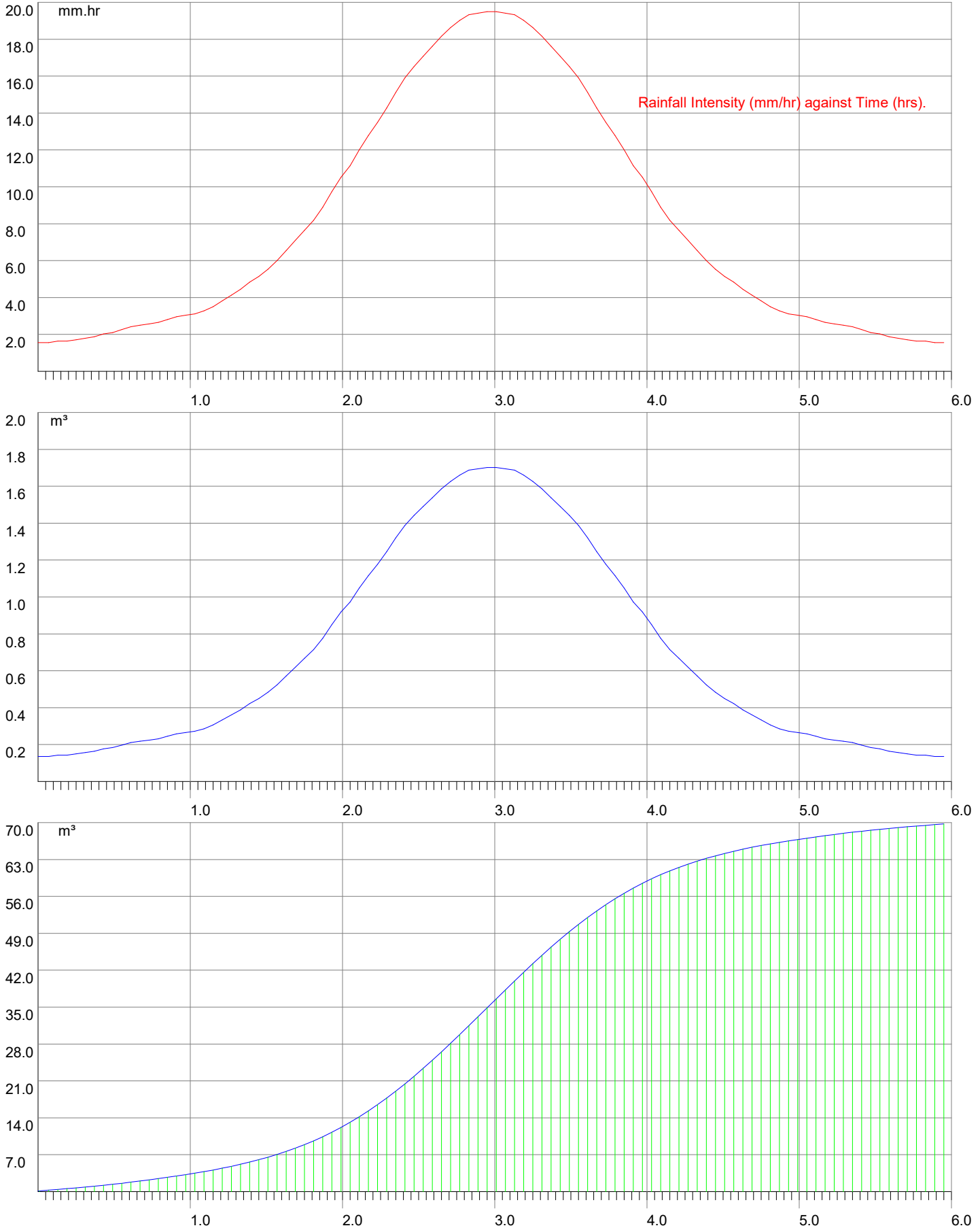
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No.	1003579		
Sheet no.	3		
Date	20/08/26		
By	GW	Checked	Reviewed
Title			

Project **Uxbridge College | 1 in 30 yr Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 30 yr +40% CC Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 30

Climate change factor = 40%

Location = UXBRIDGE

Mean intensity = 10.9mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 895 m²

Total area = 1455 m²

Total runoff = 95.3 m³

Peak flow = 11.03 l/s

Pervious area = 560 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 65.5 mm

Mean flow = 4.4 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.2	0.191	0.191
0.120	20.0	2.2	0.191	0.381
0.180	21.0	2.3	0.200	0.581
0.240	21.0	2.3	0.200	0.781
0.300	22.0	2.4	0.210	0.991
0.360	23.0	2.5	0.219	1.210
0.420	24.0	2.6	0.229	1.439
0.480	26.0	2.8	0.248	1.686
0.540	27.0	2.9	0.257	1.944
0.600	29.0	3.2	0.276	2.220
0.660	31.0	3.4	0.295	2.515
0.720	32.0	3.5	0.305	2.820
0.780	33.0	3.6	0.314	3.135
0.840	34.0	3.7	0.324	3.458
0.900	36.0	3.9	0.343	3.801
0.960	38.0	4.1	0.362	4.163
1.020	39.0	4.3	0.372	4.535
1.080	40.0	4.4	0.381	4.916
1.140	42.0	4.6	0.400	5.316
1.200	45.0	4.9	0.429	5.745
1.260	49.0	5.3	0.467	6.212
1.320	53.0	5.8	0.505	6.717
1.380	57.0	6.2	0.543	7.260
1.440	62.0	6.8	0.591	7.851
1.500	66.0	7.2	0.629	8.479
1.560	71.0	7.7	0.676	9.156
1.620	77.0	8.4	0.734	9.889
1.680	84.0	9.2	0.800	10.690
1.740	91.0	9.9	0.867	11.557
1.800	98.0	10.7	0.934	12.490
1.860	105.0	11.5	1.000	13.491
1.920	114.0	12.4	1.086	14.577
1.980	125.0	13.6	1.191	15.768
2.040	135.0	14.7	1.286	17.054
2.100	143.0	15.6	1.362	18.417
2.160	154.0	16.8	1.467	19.884
2.220	164.0	17.9	1.563	21.446



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 30 yr +40% CC Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	24.7	2.153	34.889
2.700	233.0	25.4	2.220	37.109
2.760	239.0	26.1	2.277	39.386
2.820	244.0	26.6	2.325	41.711
2.880	248.0	27.1	2.363	44.074
2.940	249.0	27.2	2.372	46.446
3.000	250.0	27.3	2.382	48.828
3.060	250.0	27.3	2.382	51.210
3.120	249.0	27.2	2.372	53.582
3.180	248.0	27.1	2.363	55.945
3.240	244.0	26.6	2.325	58.270
3.300	239.0	26.1	2.277	60.547
3.360	233.0	25.4	2.220	62.767
3.420	226.0	24.7	2.153	64.920
3.480	219.0	23.9	2.087	67.006
3.540	212.0	23.1	2.020	69.026
3.600	204.0	22.3	1.944	70.970
3.660	194.0	21.2	1.848	72.818
3.720	183.0	20.0	1.744	74.562
3.780	173.0	18.9	1.648	76.210
3.840	164.0	17.9	1.563	77.772
3.900	154.0	16.8	1.467	79.240
3.960	143.0	15.6	1.362	80.602
4.020	135.0	14.7	1.286	81.888
4.080	125.0	13.6	1.191	83.079
4.140	114.0	12.4	1.086	84.165
4.200	105.0	11.5	1.000	85.166
4.260	98.0	10.7	0.934	86.099
4.320	91.0	9.9	0.867	86.966
4.380	84.0	9.2	0.800	87.767
4.440	77.0	8.4	0.734	88.500
4.500	71.0	7.7	0.676	89.177
4.560	66.0	7.2	0.629	89.806
4.620	62.0	6.8	0.591	90.396
4.680	57.0	6.2	0.543	90.939
4.740	53.0	5.8	0.505	91.444
4.800	49.0	5.3	0.467	91.911
4.860	45.0	4.9	0.429	92.340
4.920	42.0	4.6	0.400	92.740
4.980	40.0	4.4	0.381	93.121
5.040	39.0	4.3	0.372	93.493
5.100	38.0	4.1	0.362	93.855
5.160	36.0	3.9	0.343	94.198
5.220	34.0	3.7	0.324	94.522
5.280	33.0	3.6	0.314	94.836
5.340	32.0	3.5	0.305	95.141
5.400	31.0	3.4	0.295	95.436
5.460	29.0	3.2	0.276	95.713
5.520	27.0	2.9	0.257	95.970
5.580	26.0	2.8	0.248	96.218
5.640	24.0	2.6	0.229	96.446
5.700	23.0	2.5	0.219	96.665
5.760	22.0	2.4	0.210	96.875
5.820	21.0	2.3	0.200	97.075
5.880	21.0	2.3	0.200	97.275
5.940	20.0	2.2	0.191	97.466
6.000	20.0	2.2	0.191	97.656



MasterDrain
SW

Iceni Projects

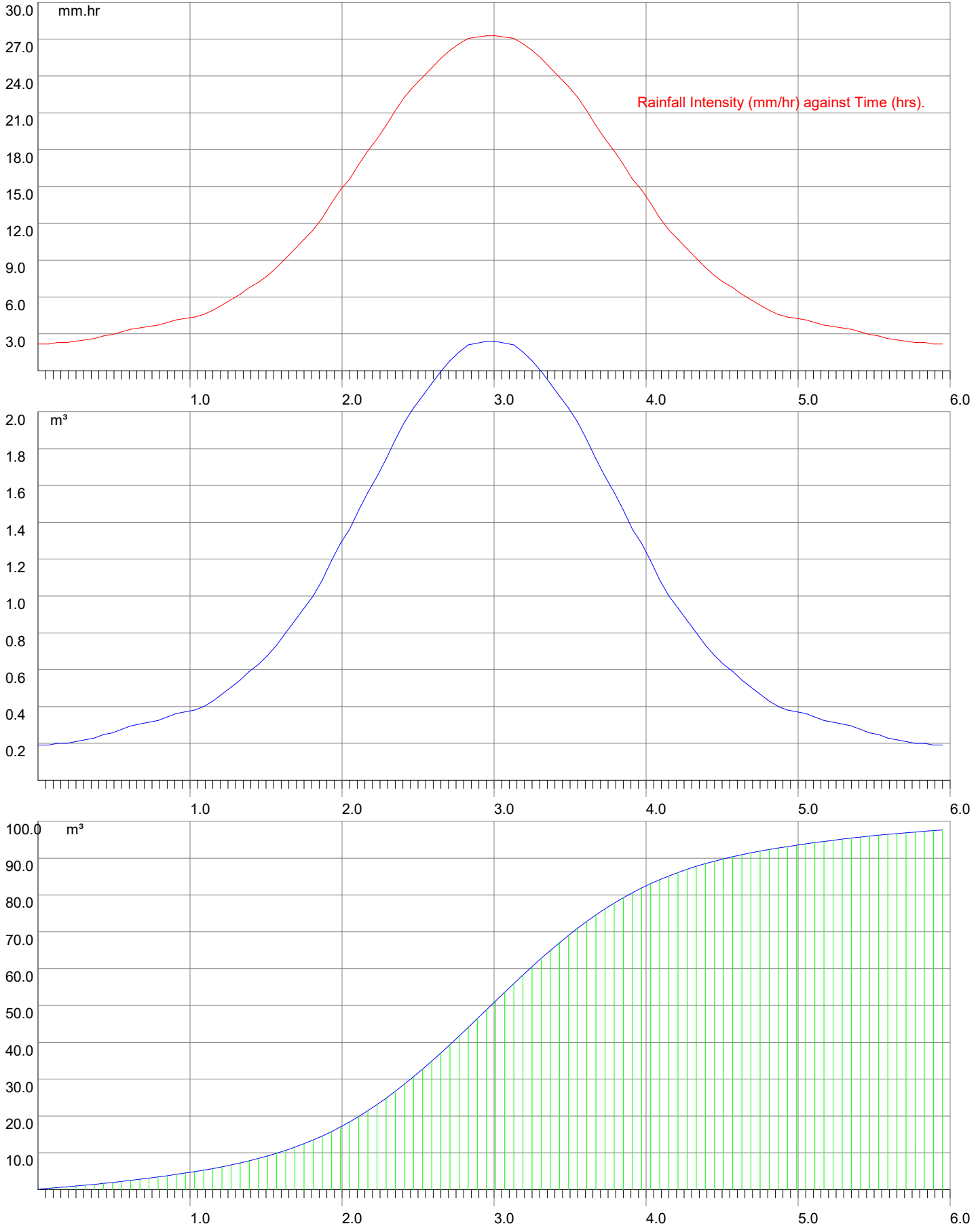
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 3		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 30 yr +40% CC Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 100

Climate change factor = 0%

Location = UXBRIDGE

Mean intensity = 10.1mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 895 m²

Total area = 1455 m²

Total runoff = 88.4 m³

Peak flow = 10.23 l/s

Pervious area = 560 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 60.8 mm

Mean flow = 4.1 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.0	0.177	0.177
0.120	20.0	2.0	0.177	0.354
0.180	21.0	2.1	0.186	0.539
0.240	21.0	2.1	0.186	0.725
0.300	22.0	2.2	0.194	0.919
0.360	23.0	2.3	0.203	1.123
0.420	24.0	2.4	0.212	1.335
0.480	26.0	2.6	0.230	1.565
0.540	27.0	2.7	0.239	1.803
0.600	29.0	2.9	0.256	2.060
0.660	31.0	3.1	0.274	2.334
0.720	32.0	3.2	0.283	2.617
0.780	33.0	3.3	0.292	2.908
0.840	34.0	3.4	0.301	3.209
0.900	36.0	3.6	0.318	3.527
0.960	38.0	3.8	0.336	3.863
1.020	39.0	3.9	0.345	4.208
1.080	40.0	4.1	0.354	4.561
1.140	42.0	4.3	0.371	4.933
1.200	45.0	4.6	0.398	5.330
1.260	49.0	5.0	0.433	5.764
1.320	53.0	5.4	0.469	6.232
1.380	57.0	5.8	0.504	6.736
1.440	62.0	6.3	0.548	7.284
1.500	66.0	6.7	0.583	7.867
1.560	71.0	7.2	0.628	8.495
1.620	77.0	7.8	0.681	9.176
1.680	84.0	8.5	0.743	9.918
1.740	91.0	9.2	0.804	10.723
1.800	98.0	9.9	0.866	11.589
1.860	105.0	10.6	0.928	12.517
1.920	114.0	11.5	1.008	13.525
1.980	125.0	12.7	1.105	14.630
2.040	135.0	13.7	1.193	15.823
2.100	143.0	14.5	1.264	17.087
2.160	154.0	15.6	1.361	18.449
2.220	164.0	16.6	1.450	19.899



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	22.9	1.998	32.372
2.700	233.0	23.6	2.060	34.431
2.760	239.0	24.2	2.113	36.544
2.820	244.0	24.7	2.157	38.701
2.880	248.0	25.1	2.192	40.893
2.940	249.0	25.2	2.201	43.094
3.000	250.0	25.3	2.210	45.304
3.060	250.0	25.3	2.210	47.514
3.120	249.0	25.2	2.201	49.715
3.180	248.0	25.1	2.192	51.908
3.240	244.0	24.7	2.157	54.065
3.300	239.0	24.2	2.113	56.177
3.360	233.0	23.6	2.060	58.237
3.420	226.0	22.9	1.998	60.235
3.480	219.0	22.2	1.936	62.171
3.540	212.0	21.5	1.874	64.045
3.600	204.0	20.7	1.803	65.848
3.660	194.0	19.6	1.715	67.563
3.720	183.0	18.5	1.618	69.181
3.780	173.0	17.5	1.529	70.710
3.840	164.0	16.6	1.450	72.160
3.900	154.0	15.6	1.361	73.521
3.960	143.0	14.5	1.264	74.785
4.020	135.0	13.7	1.193	75.979
4.080	125.0	12.7	1.105	77.084
4.140	114.0	11.5	1.008	78.091
4.200	105.0	10.6	0.928	79.020
4.260	98.0	9.9	0.866	79.886
4.320	91.0	9.2	0.804	80.690
4.380	84.0	8.5	0.743	81.433
4.440	77.0	7.8	0.681	82.113
4.500	71.0	7.2	0.628	82.741
4.560	66.0	6.7	0.583	83.325
4.620	62.0	6.3	0.548	83.873
4.680	57.0	5.8	0.504	84.376
4.740	53.0	5.4	0.469	84.845
4.800	49.0	5.0	0.433	85.278
4.860	45.0	4.6	0.398	85.676
4.920	42.0	4.3	0.371	86.047
4.980	40.0	4.1	0.354	86.401
5.040	39.0	3.9	0.345	86.746
5.100	38.0	3.8	0.336	87.081
5.160	36.0	3.6	0.318	87.400
5.220	34.0	3.4	0.301	87.700
5.280	33.0	3.3	0.292	87.992
5.340	32.0	3.2	0.283	88.275
5.400	31.0	3.1	0.274	88.549
5.460	29.0	2.9	0.256	88.805
5.520	27.0	2.7	0.239	89.044
5.580	26.0	2.6	0.230	89.274
5.640	24.0	2.4	0.212	89.486
5.700	23.0	2.3	0.203	89.689
5.760	22.0	2.2	0.194	89.884
5.820	21.0	2.1	0.186	90.069
5.880	21.0	2.1	0.186	90.255
5.940	20.0	2.0	0.177	90.432
6.000	20.0	2.0	0.177	90.609



MasterDrain
SW

Iceni Projects

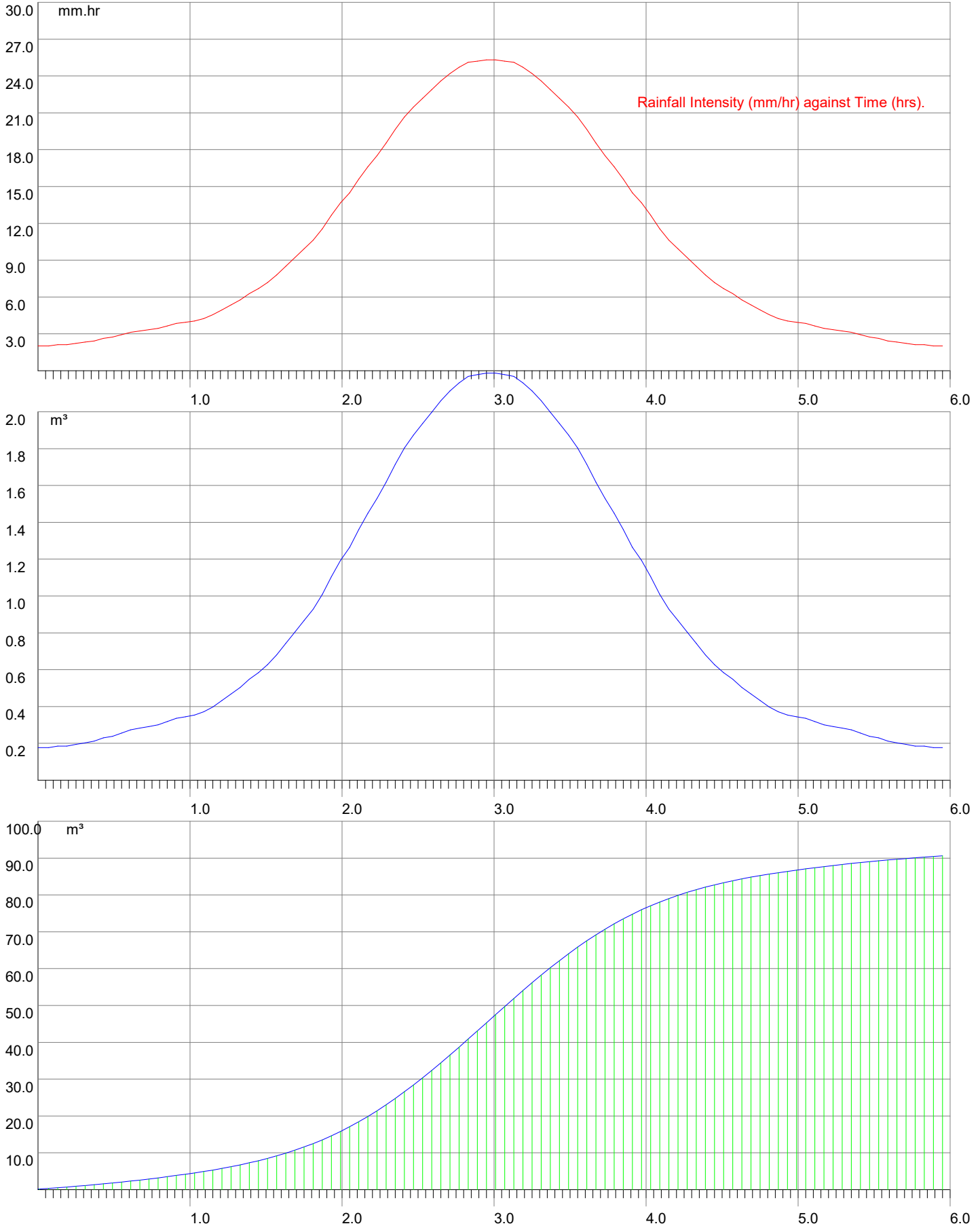
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No.	1003579		
Sheet no.	3		
Date	20/08/26		
By	GW	Checked	Reviewed
Title			

Project **Uxbridge College | 1 in 100 yr Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**





MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 1		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr +40% CC Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Data:-

Hydrology:-

Grid reference = TQ0583

Return period = 100

Climate change factor = 40%

Location = UXBRIDGE

Mean intensity = 14.2mm/hr for a 6 hour storm

FSR data

M5-60 = 20

Soil index = 0.45

WRAP value = 4

r = 0.43

SAAR = 675

FEH data

FEH data not available.

FSR data used to calculate rainfall rates.

Percentage runoff = 100.0% (manual setting)

Imperv. area = 895 m²

Total area = 1455 m²

Total runoff = 123.8 m³

Peak flow = 14.32 l/s

Pervious area = 560 m²

Equiv area = 1455 m² (Tot. area x % runoff).

Total rainfall depth = 85.1 mm

Mean flow = 5.7 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
0.060	20.0	2.8	0.248	0.248
0.120	20.0	2.8	0.248	0.495
0.180	21.0	3.0	0.260	0.755
0.240	21.0	3.0	0.260	1.015
0.300	22.0	3.1	0.272	1.287
0.360	23.0	3.3	0.285	1.572
0.420	24.0	3.4	0.297	1.869
0.480	26.0	3.7	0.322	2.191
0.540	27.0	3.8	0.334	2.525
0.600	29.0	4.1	0.359	2.884
0.660	31.0	4.4	0.384	3.267
0.720	32.0	4.5	0.396	3.663
0.780	33.0	4.7	0.408	4.072
0.840	34.0	4.8	0.421	4.492
0.900	36.0	5.1	0.446	4.938
0.960	38.0	5.4	0.470	5.408
1.020	39.0	5.5	0.483	5.891
1.080	40.0	5.7	0.495	6.386
1.140	42.0	6.0	0.520	6.906
1.200	45.0	6.4	0.557	7.463
1.260	49.0	6.9	0.606	8.069
1.320	53.0	7.5	0.656	8.725
1.380	57.0	8.1	0.705	9.430
1.440	62.0	8.8	0.767	10.198
1.500	66.0	9.4	0.817	11.014
1.560	71.0	10.1	0.879	11.893
1.620	77.0	10.9	0.953	12.846
1.680	84.0	11.9	1.040	13.886
1.740	91.0	12.9	1.126	15.012
1.800	98.0	13.9	1.213	16.225
1.860	105.0	14.9	1.299	17.524
1.920	114.0	16.2	1.411	18.935
1.980	125.0	17.7	1.547	20.482
2.040	135.0	19.1	1.671	22.153
2.100	143.0	20.3	1.770	23.922
2.160	154.0	21.8	1.906	25.828
2.220	164.0	23.2	2.030	27.858



MasterDrain
SW

Iceni Projects

<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 2		
Date 20/08/26		
By GW	Checked	Reviewed

Project Uxbridge College 1 in 100 yr +40% CC Post-Development Runoff Rates
Title Hydrograph runoff calcs (Winter profile) for Uxbridge

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Cumulative (m3)
2.640	226.0	32.0	2.797	45.320
2.700	233.0	33.0	2.884	48.204
2.760	239.0	33.9	2.958	51.162
2.820	244.0	34.6	3.020	54.181
2.880	248.0	35.2	3.069	57.250
2.940	249.0	35.3	3.082	60.332
3.000	250.0	35.4	3.094	63.426
3.060	250.0	35.4	3.094	66.520
3.120	249.0	35.3	3.082	69.602
3.180	248.0	35.2	3.069	72.671
3.240	244.0	34.6	3.020	75.690
3.300	239.0	33.9	2.958	78.648
3.360	233.0	33.0	2.884	81.532
3.420	226.0	32.0	2.797	84.329
3.480	219.0	31.0	2.710	87.039
3.540	212.0	30.1	2.624	89.663
3.600	204.0	28.9	2.525	92.187
3.660	194.0	27.5	2.401	94.588
3.720	183.0	25.9	2.265	96.853
3.780	173.0	24.5	2.141	98.994
3.840	164.0	23.2	2.030	101.024
3.900	154.0	21.8	1.906	102.930
3.960	143.0	20.3	1.770	104.699
4.020	135.0	19.1	1.671	106.370
4.080	125.0	17.7	1.547	107.917
4.140	114.0	16.2	1.411	109.328
4.200	105.0	14.9	1.299	110.627
4.260	98.0	13.9	1.213	111.840
4.320	91.0	12.9	1.126	112.966
4.380	84.0	11.9	1.040	114.006
4.440	77.0	10.9	0.953	114.959
4.500	71.0	10.1	0.879	115.838
4.560	66.0	9.4	0.817	116.654
4.620	62.0	8.8	0.767	117.422
4.680	57.0	8.1	0.705	118.127
4.740	53.0	7.5	0.656	118.783
4.800	49.0	6.9	0.606	119.389
4.860	45.0	6.4	0.557	119.946
4.920	42.0	6.0	0.520	120.466
4.980	40.0	5.7	0.495	120.961
5.040	39.0	5.5	0.483	121.444
5.100	38.0	5.4	0.470	121.914
5.160	36.0	5.1	0.446	122.360
5.220	34.0	4.8	0.421	122.780
5.280	33.0	4.7	0.408	123.189
5.340	32.0	4.5	0.396	123.585
5.400	31.0	4.4	0.384	123.968
5.460	29.0	4.1	0.359	124.327
5.520	27.0	3.8	0.334	124.661
5.580	26.0	3.7	0.322	124.983
5.640	24.0	3.4	0.297	125.280
5.700	23.0	3.3	0.285	125.565
5.760	22.0	3.1	0.272	125.837
5.820	21.0	3.0	0.260	126.097
5.880	21.0	3.0	0.260	126.357
5.940	20.0	2.8	0.248	126.604
6.000	20.0	2.8	0.248	126.852



MasterDrain
SW

Iceni Projects

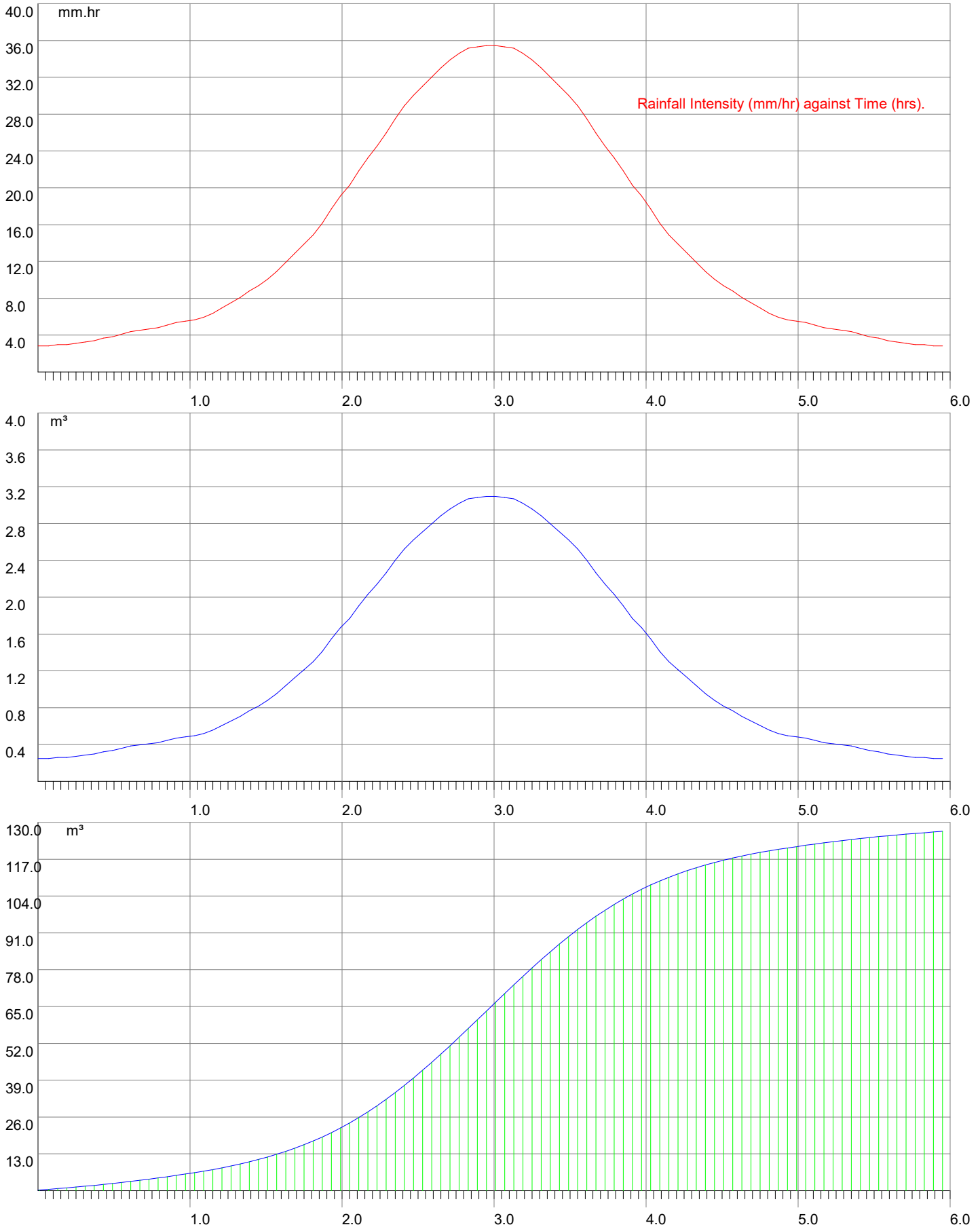
<https://www.iceniprojects.com>

Da Vinci House,
44 Saffron Hill,
London EC1N 8FH
Tel: 0203 6408508
email: London@iceniprojects.com

Job No. 1003579		
Sheet no. 3		
Date 20/08/26		
By GW	Checked	Reviewed

Project **Uxbridge College | 1 in 100 yr +40% CC Post-Development Runoff Rates**

Title **Hydrograph runoff calcs (Winter profile) for Uxbridge**



A5. GENERAL NOTES

- A5.1 The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Iceni Projects Ltd for inaccuracies in the data supplied by any other party.
- A5.2 The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.
- A5.3 No site visits have been carried out, unless otherwise specified.
- A5.4 This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in guidance may necessitate a re-interpretation of the report in whole or in part after its original submission.
- A5.5 The copyright in the written materials shall remain the property of Iceni Projects Ltd but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to Iceni Projects Ltd by the client of the outstanding amounts.
- A5.6 The report is provided for sole use by the Client and is confidential to them and their professional advisors. No responsibility whatsoever for the contents of the report will be accepted to any person other than the client, unless otherwise agreed.
- A5.7 These terms apply in addition to the Iceni Projects Ltd "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail.). In the absence of such a written contract the Standard Terms of Business will apply.
-