



Thames Valley Park Data Centre

Flood Risk Assessment & Surface Water Drainage Strategy

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Executive Summary

This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Ove Arup & Partners (Arup) and has been commissioned by BCS Consultancy Ltd, on behalf of FH Trustees¹ (the Applicant). This report supports an outline planning application submitted to Wokingham Borough Council (the Council) in relation to the following Proposed Development, at **Microsoft Campus, Thames Valley Park, Reading, RG6 1WG** (the Site).

“Outline planning application (all matters reserved except for Access) for the construction of a data centre, fuel cells for energy generation, including ancillary office space and associated plant, drainage, backup generation, car parking, landscaping, and internal maintenance access roads.”

After a comprehensive review of flood risk data and publicly available information, this report concludes that the risk of flooding from all sources is medium, however is reduced to low through the implementation of suitable mitigation in line with the requirements:

- National Planning Policy Framework
- Wokingham Borough Core Strategy (Adopted 29 January 2010, reviewed October 2023)
- WBC Development Plan: Adopted Managing Development Delivery Plan (February 2014)
- Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (SFRA) (2020)

A summary of the flood risk is provided below in Table A.

Table A Flood risk summary

Flood Source	Pathway	Comment	Risk
Fluvial and Tidal	River Thames 600m to the north of the Site	EA flood maps confirm the Site is entirely located within Flood Zone 1.	Negligible / Not at risk
Groundwater	Through underlying strata when groundwater levels rise above surface levels.	Groundwater flood risk is identified as moderate within the site extents. The drainage and external levels strategy should therefore consider potential groundwater emergence and avoid creating low points where groundwater could be contained. However, as the proposed development does not include a basement the risk is low.	Low with suitable mitigation (as needed)
Artificial Sources	No reservoirs or other artificial sources within site environs.	EA flood maps show that the site is not at risk of reservoir flooding.	Negligible/Not at risk
Pluvial	Overland flow or overloading of existing sewers. Generally, at topographic low points.	High pluvial flood risk is identified around the existing south-eastern hardstanding areas, caused by the existing buildings obstructing surface water flow. Demolition of the offices and the proposed drainage strategy will reduce this risk. The development surface water drainage strategy reduces the pluvial flood risk to low.	Low with suitable mitigation (as needed)
Infrastructure Failure	Burst water main inundating local sewer network	Multiple small water mains in adjacent road networks. No large infrastructure features have been identified in the local area. There are no basement structures proposed as part of the development. In the event of a burst water	Low with suitable mitigation (as needed)

¹ FH Trustees and FH Trustees 2 as trustees of the Mapeley Beta HL Unit Trust

Flood Source	Pathway	Comment	Risk
		main, the surface water network will collect and convey runoff away from all critical infrastructure.	

1. Introduction

This FRA has been prepared in accordance with the requirements of the National Planning Policy Framework (NPPF) (specifically Chapter 18), with reference to relevant adopted Wokingham Borough Council planning policy and flood risk guidance. This report forms part of the outline planning application, to be submitted to Wokingham Borough Council as the Local Planning Authority (LPA) and Lead Local Flood Authority (LLFA).

The Site is located within the administrative boundary of Wokingham Borough Council. It is bounded by the Great Western Main Line to the south, farmland to the south-east, and the wider Thames Valley Park to the north, east and west.

1.1 Scope of Report

This report is written with reference to the NPPF and draws upon both local policy pertinent to surface water and flood risk management and uses publicly available data. The site is located within a Flood Zone 1 area. However, in accordance with the requirements of the NPPF, a detailed Flood Risk Assessment is still required as the site extents are larger than 1 hectare.

The purpose of this report is to provide an assessment of flood risk to demonstrate that the Site is low risk from all sources of potential flooding. As part of this assessment, this report will:

- Identify and assess potential sources of flooding to the Site;
- Assess historical flood events associated with the Site;
- Assess the potential impacts of the development proposals upon the local hydrological regime;
- Outline ways in which the site will manage surface and assess the ability of the site to utilise sustainable drainage systems, and;
- Propose measures for the management of residual risks.

1.2 Sources of Information

The key sources of information reviewed as part of this study are listed in Table 1.

Table 1 Key Sources of Information

Title	Author	Date
National Planning Policy Framework (NPPF) (and the National Planning Policy Framework)	Ministry of Housing, Communities & Local Government	August 2026
Wokingham Borough Core Strategy	Wokingham Borough Council	Adopted 29 January 2010 (reviewed October 2023)
WBC Development Plan: Adopted Managing Development Delivery Plan	Wokingham Borough Council	February 2014
Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (SFRA)	Wokingham Borough Council	2020
Drainage Search Report	Thames Water	23 April 2018
Technical Due Diligence Report	Arcadis	13 September 2018
Asset Location Search Sewer Map	Thames Water	18 November 2025
Topographical Survey	PRE Chartered Surveyors	12 January 2026
Flood Mapping Data for Fluvial and Pluvial Sources	Environment Agency	August 2022
Flood Estimation Handbook (FEH) Web Version (FEH13) – Greenfield Runoff Rates	UK Centre for Ecology & Hydrology (via uksuds.com)	July 2026
Climate Change Guidance: Rainfall Intensity Allowances in Small and Urban Catchments	Environment Agency	May 2022

1.3 Consultation

This report has been prepared from a desktop assessment only and no direct consultation with the Lead Local Flood Authority (Wokingham Borough Council) has been undertaken at this stage.

A pre-planning application form has been submitted to Thames Water Utilities Ltd (TWUL) to confirm capacity in the network and proposed discharge rates. As of 11 August 2026, there has not been a further response from TWUL.

1.4 Limitations

This report has been prepared for the use the Applicant in relation to the proposed Thames Valley Park Data Centre. It takes into account our Client's instructions and requirements and addresses their priorities at the time. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party in relation to it, except as provided for in Arup's agreement with our client.

Arup has based this report on the sources detailed within it and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of third-party information. Reasonable skill and care have been exercised in preparation of this report in accordance with the technical requirements of the brief.

This report has been prepared based on current legislation, statutory requirements, planning policy and industry good practice at the time of writing. Any subsequent changes or new guidance may require the findings, conclusions and recommendations made in this report to be reassessed in light of the circumstances.

2. Policy and Guidance

The following section details specific local policy and guidance pertinent to flood risk and surface water drainage that are applicable to the proposals. This section does not outline National Legislation, Regulations or Guidance which is provided in Appendix A.

2.1.1 Wokingham Borough Core Strategy (Adopted 29 January 2010, reviewed October 2023)

The Wokingham Borough Core Strategy is the principal planning document that sets out how the borough was expected to grow and develop up to 2026. It establishes the long-term vision, strategic objectives, and policies that guide decisions on housing, employment, transport, infrastructure, environmental protection, community facilities, and the distribution of development across the borough.

The following core strategy policies relate directly to flood risk and drainage:

- Limit any adverse effects on water quality (including groundwater);
- Ensure the provision of adequate drainage, and;
- Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater)

2.1.2 WBC Development Plan: Adopted Managing Development Delivery Plan (February 2014)

The Adopted WBC Development Plan is an important part of implementing the adopted Core Strategy. The following policies are pertinent to flood risk and drainage:

- Policy CC04: Sustainable Design and Construction – water resource management:

Sustainable Drainage Systems (SuDS) can significantly reduce demand for water by incorporating SuDS as part of the design and landscaping of the site, as set out in the Sustainable Design and Construction SPD and Companion Guide.

- Policy CC09: Development and Flood Risk (from all sources):

All sources of flood risk, including historic flooding, must be taken into account at all stages and to the appropriate degree at all levels in the planning application process to avoid inappropriate development in areas at risk of flooding.

- Policy CC10: Sustainable Drainage:

All development proposals must ensure surface water arising from the proposed development including taking into account climate change is managed in a sustainable manner. This must be demonstrated through a Flood Risk Assessment or through a Surface Water Drainage Strategy.

2.1.3 Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (SFRA) (2020)

The Wokingham Borough Council Strategic Flood Risk Assessment provides a comprehensive and robust evidence base on flood risk issues to support the review and update of the Wokingham Borough Council's planning policies. This report provides a summary of the flood risk in Wokingham Borough, including fluvial, surface water, climate change, sewer, ground, and reservoirs.

2.1.4 Thames Water Utilities Limited (TWUL)

Thames Water Utilities Limited (TWUL) provides guidance and regulatory compliance for drainage proposals in accordance with the requirements of the drainage authority.

In accordance with the Building Act 2000 Clause H3.3, positive connections to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy is as follows:

1. Soakaways;
2. Watercourses;
3. Sewers.

Only when it can be proven that soakage into the ground or a connection into an adjacent watercourse is not possible would TWUL consider a restricted discharge into the public surface water sewer network.

3. Environmental Setting

3.1 Site Location

The site, located at Thames Valley Park, Thames Valley Park Drive, Sonning, Reading RG6 1RB, extends to approximately 5.4 hectares within the established Thames Valley Business Park. The site currently comprises of three commercial office buildings, car parking and associated highway infrastructure, and landscaped areas. The postcode is RG6 1WG. The OS grid reference is SU 74714 74131.

As outlined in Figure 1, in the vicinity of the site there are commercial offices to the west, landscaped areas and open fields to the east, and the great western railway line to the south. The River Thames and Caversham Lakes are situated further north, and there is a small woodland and water body directly north of the site.



Figure 1 Site location and surrounding infrastructure (Google Maps)

3.2 Existing Conditions

The existing site conditions including topography, ground conditions, waterbodies, existing infrastructure, and flooding risks are outlined within this section.

3.2.1 Topography

The existing site consists of hardstanding areas, including building roofs, and soft landscaping areas. The existing site topography generally falls from south-east to north-west, with the site high point approximately 51.6m and site low point at 38.2m. The general topographical falls and key point levels are annotated in Figure 2.

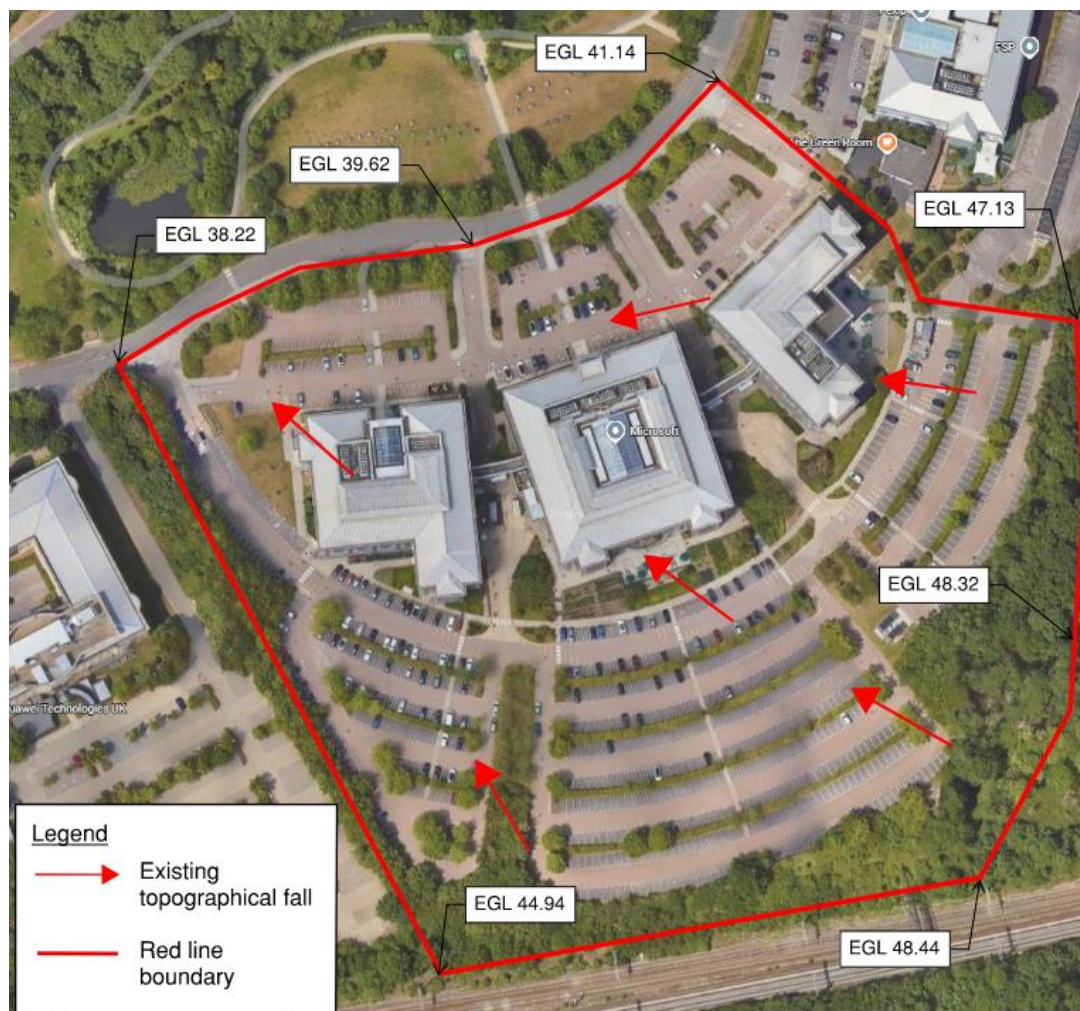


Figure 2 Existing site topography

3.2.2 Ground Conditions

The generalised ground model (strata sequence) across of the site is summarised in Table 2. There are no landslip deposits or bedrock faults recorded within 500m of the site.

Table 2 Ground Investigation Strata sequence

Stratum	Typical Depth (m below ground level)	Description
Hardstanding / Topsoil	0.0 - 0.4	Asphalt, brick paving, sub-base, or local topsoil in landscaped areas.
Made Ground	0.1 - 1.3	Sandy gravelly clay and clayey sandy gravel containing flint, brick, concrete and localised pulverised fuel ash (PFA). Highly variable.
Superficial Deposits (River Terrace Deposits)	~0.2 - 2.9	Firm sandy gravelly clay with interbedded sand and gravel layers. Corresponds to Langley Silt and Kempton Park Gravels.
Lambeth Group	~2.9 - 10.4	Highly variable interbedded clay, silty sand, clayey sand and sandy gravel. Medium dense to dense.
Chalk	~4.1 - 10.4+ to termination	Very weak to weak weathered chalk near the top, becoming more structured with depth (approximately 12-17 m bgl). Flints and marl bands present. Proven to 20 m depth.

Groundwater was encountered within the chalk aquifer at depths between approximately 9 m and 11 m below ground level (bgl), with monitored groundwater levels generally stabilising between 9.6 m and 10.8 m bgl. Localised perched groundwater was recorded at approximately 2.5 m bgl within superficial deposits, although monitoring indicates these horizons are discontinuous and restricted to isolated granular layers.

Aquifer records indicate that the site is underlain by Secondary A aquifer deposits within the superficial geology, with bedrock aquifer mapping also identifying Secondary A strata beneath the site². Unproductive strata were also recorded locally within the site boundary. BRE365 survey testing is ongoing to understand the ability of the existing ground conditions to infiltrate water.

3.2.3 Existing Rivers/Water Bodies

There is a small water body directly north of the site. The River Thames and Caversham Lakes are situated further north, with the River Thames approximately 600m away at its closest point.

² OnyxGeo - Phase 2 Site Investigation Report (5 June 2026)

3.2.4 Existing Infrastructure - Surface Water Drainage

A site-wide Drainage Search report³, prepared by Thames Water on 23 April 2018, Technical Due Diligence report⁴ by Arcadis on 13 September 2018, and asset location plan and topographical survey were reviewed to determine the existing surface water network.

It was identified that the above ground drainage consists of a combination of cast iron soil and vent risers connecting to the below ground drainage. Where visible and could be inspected, the existing above ground drainage was determined to be in a good condition. The existing below ground drainage was not inspected, therefore the existing condition is unknown.

The Drainage Search report and Technical Due Diligence report both identified that the existing drainage network does not discharge to the local sewerage network. The reports do not state a discharge point or methodology.

In conjunction with the reports above, the asset location search sewer map, received on 18 November 2025 and shown in Figure 3, did not identify an existing surface water drainage network within the access road.

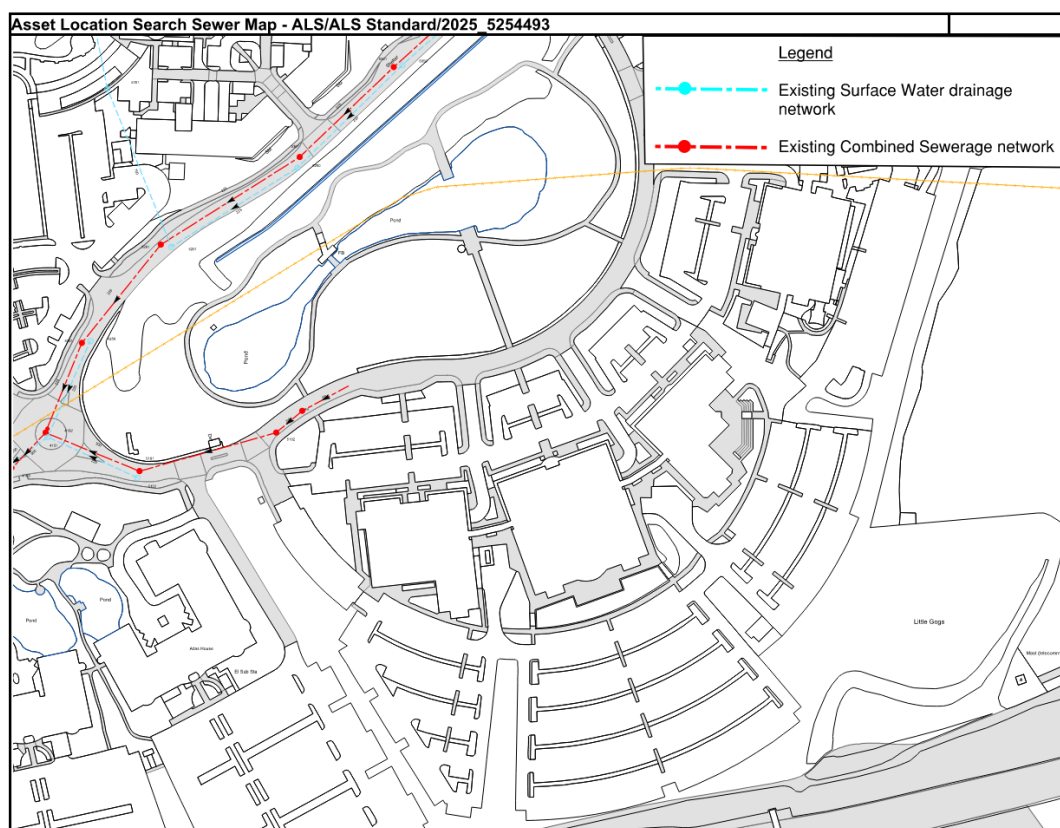


Figure 3 Asset location search map

In contrast to the information provided in the reports and the asset location survey, a topographical survey undertaken on 12 January 2026, identified that the existing below ground drainage network flows north to manholes in the access road (outside of the site extents) see Figure 4. The topographical information implies that the site catchment does in fact discharge to a local drainage network situated in the access road.

³ Thames Water Property Searches – Drainage & Water Enquiry – Buildings 1,2 and 3 Microsoft Campus, Thames Valley Park, Reading

⁴ Arcadis – Technical Due Diligence report – Project Beta - Buildings 1,2 and 3 Microsoft Campus

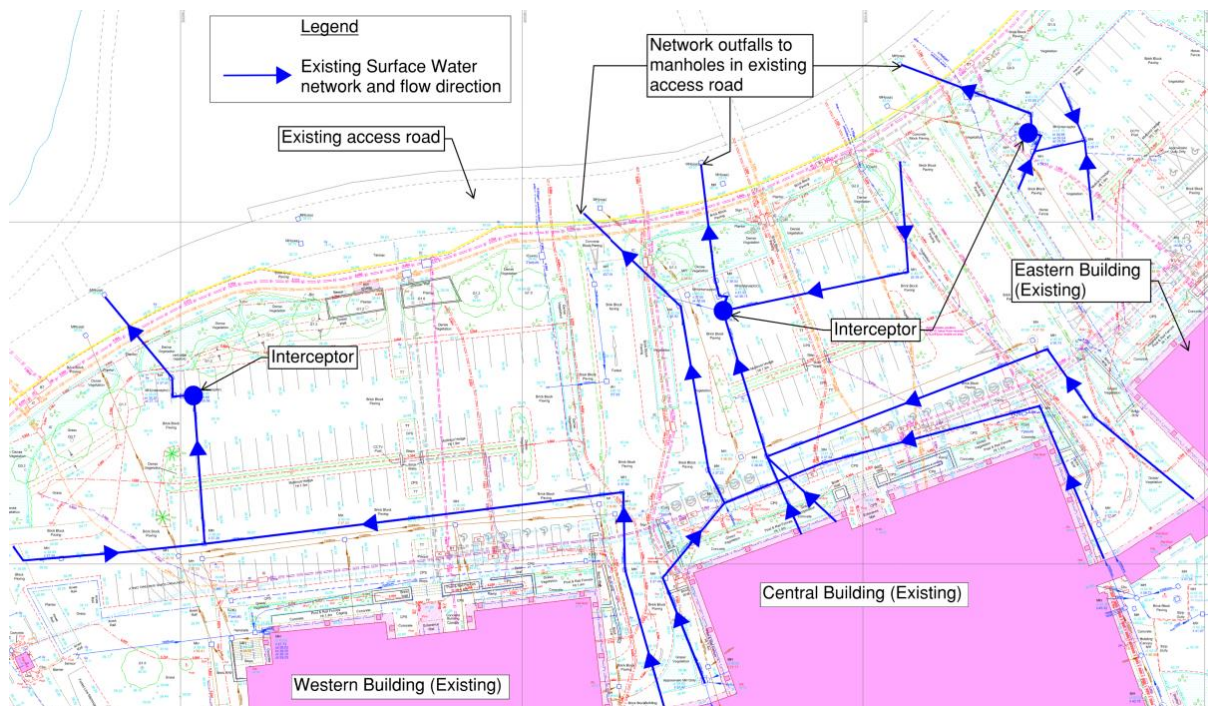


Figure 4 Existing surface water network identified on topographical survey⁵

In consideration of the information reviewed, it is assumed that a private drainage network (not identified within the asset location search map) extends east along the access road to collect all surface water drainage outfalls. It is assumed that this connects into the most eastern manhole of the Thames Water combined sewer network, identified on the asset location search map, to discharge the site's surface water drainage into the local network. This assumption is illustrated in Figure 5 and should be confirmed by a CCTV drainage survey prior to construction.

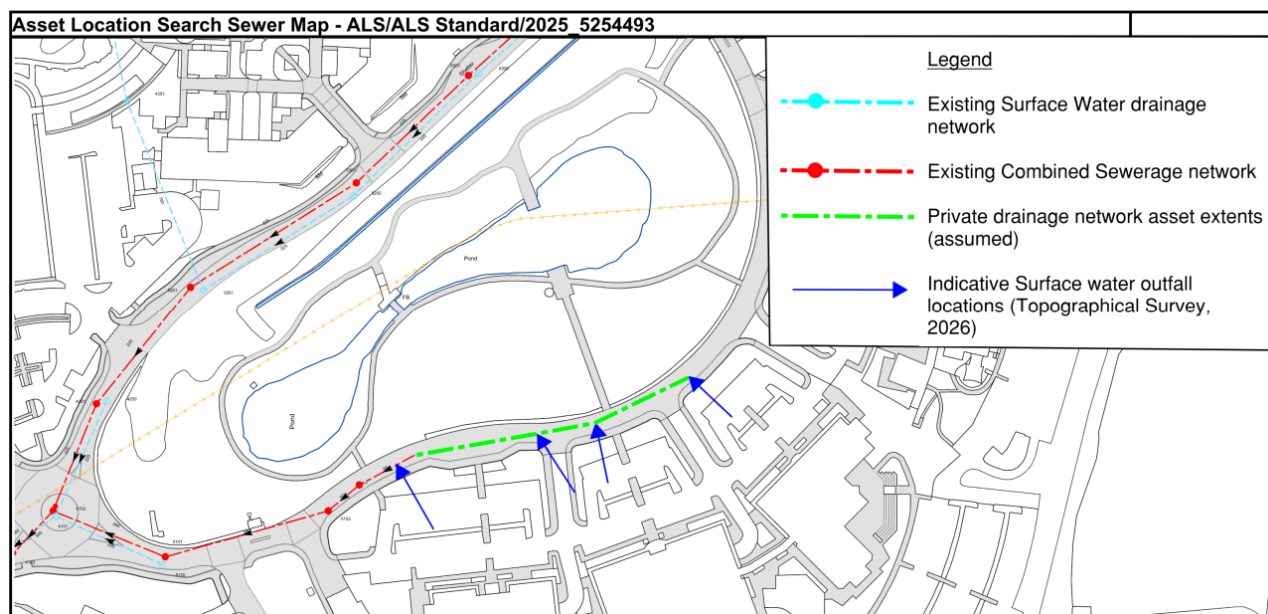


Figure 5 Assumed private drainage network to local sewerage network

There are two interceptors installed in the northern section of the car park, these are situated at the end of the site drainage network as shown in Figure 4, prior discharging outside of the site boundary into the existing highway network. It is assumed the interceptors are suitable to contain oil / petrol spills before discharging off site.

⁵ Topographical Survey – Pre-Chartered Surveyors

3.2.5 Existing Infrastructure - Domestic Foul Sewerage

The drainage search report identified that the foul sewerage water from the property drains to a Thames Water public sewer, this is assumed to be a combined sewer on review of the Thames Water asset drawings.

The topographical survey information and asset location search sewer map coincide to show that the foul sewerage generated in the site extents is discharged to the local sewerage network in the access road. Figure 6 highlights the foul sewerage network within the site extents on the topographical survey.

The existing foul sewerage network has capacity to accommodate three large commercial offices.

In accordance with BSRIA Rules of Thumb to estimate existing worker populations, it can be assumed 12m² per person. The existing commercial office has a gross floor area of 22,867m². Therefore, the design population can be estimated at 1900 staff members.

A commercial office has an approximate potable water daily demand of 45l/person⁶, typically 90% of incoming potable enters the foul network. Therefore, it is assumed that the existing network has an approximate capacity of 76,000l per day.

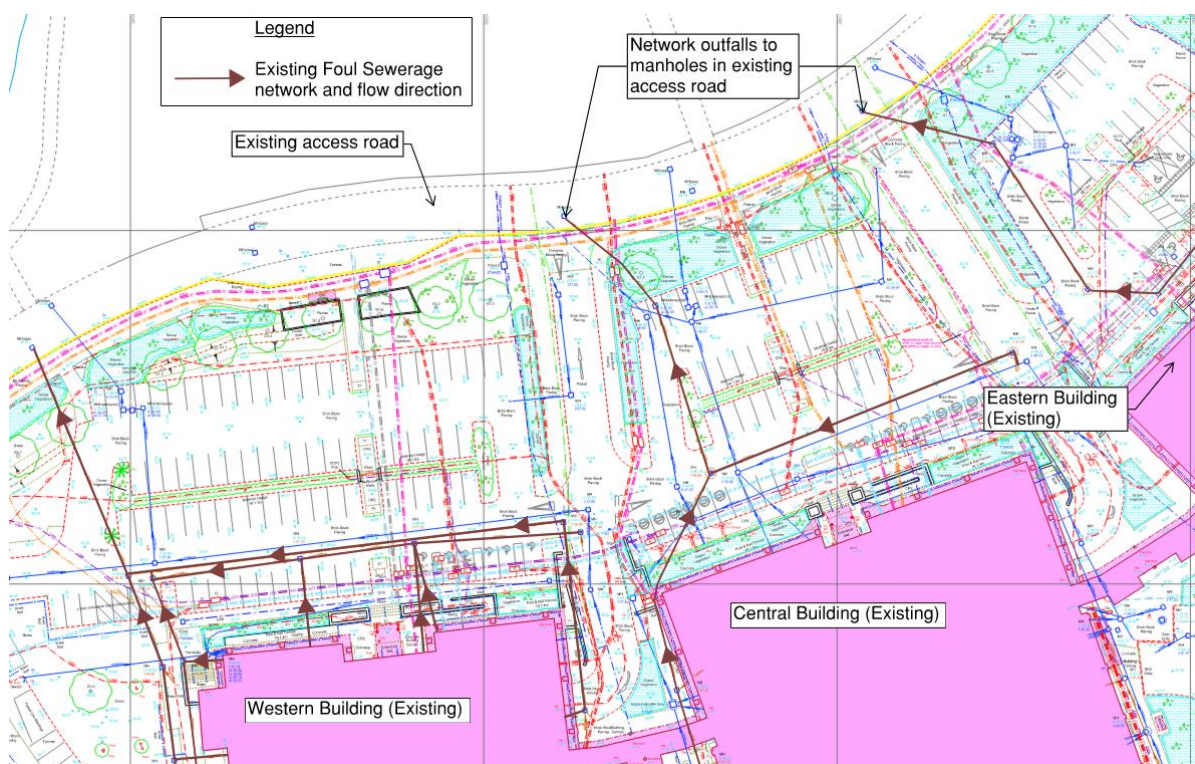


Figure 6 Existing foul sewerage network identified on Topographical Survey

3.2.6 Existing Infrastructure – Industrial Foul Sewerage

The existing site has a grease trap installed in the main outlet from the kitchens (north of Central Building) before connecting into the existing local sewerage network.

In consideration of the operational requirements for a commercial office, it is assumed that there are no other existing industrial foul sewerage volumes

⁶ BSRIA Rules of Thumb – Guidelines for building services (5th Edition)

3.2.7 Historic Flooding

According to the Strategic Flood Risk Assessment (SFRA), Wokingham Borough Council has provided records of historical flooding incidents across the Borough between 1947 and 2015. These records identify flooding from a combination of local drainage/surface water, surface water, sewer-related flooding and channel capacity exceedance.

The recorded incidents are generally noted to have affected wider areas of the Borough, including the west and north of the Borough, areas adjacent to the Foudry Brook and River Loddon, and clusters around Wokingham, Winnersh and Three Mile Cross. Based on the information provided in the SFRA, no historical flooding incidents are identified as having occurred within the site boundary. Therefore, there are no known records of historical flooding at the site, however the Environmental Agency (EA) historic flood map, refer to Figure 7, shows that flooding has occurred previously nearby to the north of the site, it is not understood when these events occurred.

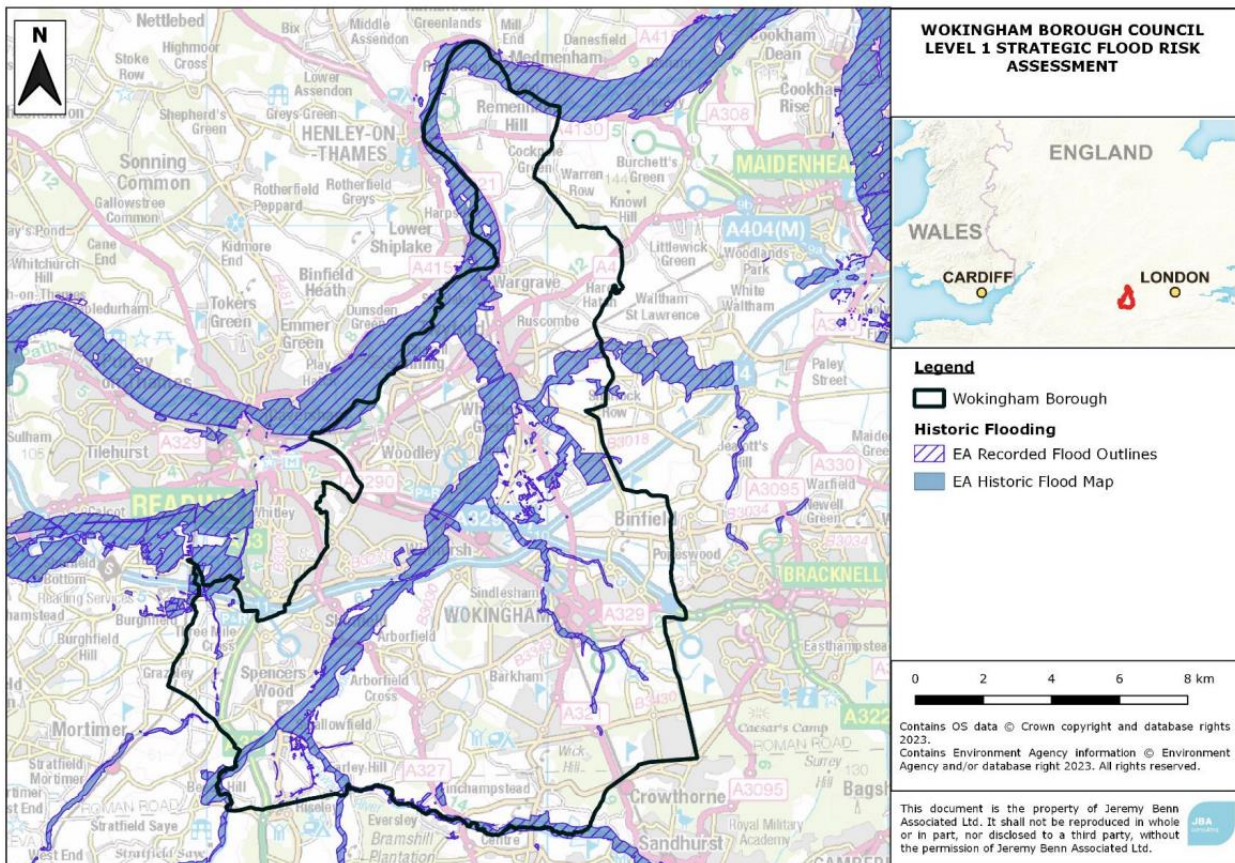


Figure 7 SFRA Historic Flood Map⁷

⁷ Wokingham Borough Council Level 1 Strategic Flood Risk Assessment (May 2023)

4. Development Proposal

4.1 Proposed development Layout

This Planning Application seeks Outline planning permission for data centre development comprising B8 Use Class floor space and fuel cells. The Description of Development for which planning permission is sought is:

“Outline planning application (all matters reserved except for Access) for demolition of existing buildings and the construction of a data centre (Use Class B8), fuel cells for energy generation, ancillary office space and associated plant, drainage, backup power generation, sub-station, car parking, landscaping, engineering works and formation of and alterations to access roads.”

The works that form the Proposed Development comprise:

- data centre halls behind the office frontage comprising approximately 37,000m² of floorspace, excluding fuel cells and generators;
- A substation and compound
- An administrative/office at the front;
- Electrical equipment and generators;
- Double-stacked fuel cells at the east and west of the main building;
- Two access points to the Thames Valley Park estate road – one main access point at the north-west corner, and one emergency access point further east;
- Internal access roads circulating the main buildings, and maintenance access road;
- A security lodge at the main site entrance;
- A car parking area, positioned at the front of the office/admin building; and
- Landscaping and engineering works.

Figure 8 outlines the anticipated layout of the Proposed Development.

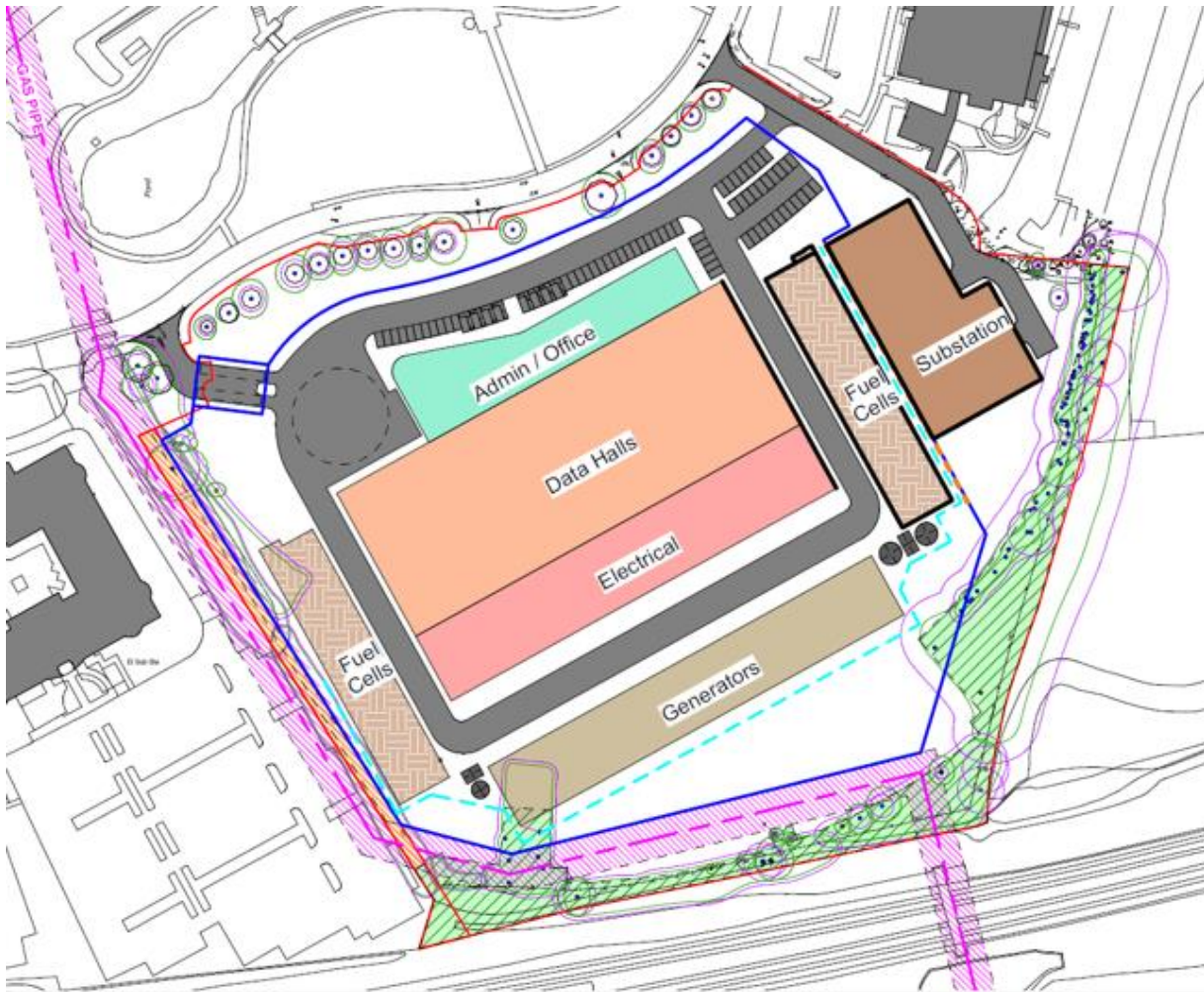


Figure 8 Proposed Development Site Layout

Other key characteristics of the proposed scheme are as follows:

- Provision of a primary access from the Thames Valley Park estate road at the north-west corner of the site, forming the main route into the development.
- Provision of a secondary emergency access point to the east of the site, supporting emergency and operational requirements.
- The maximum building height will be approximately 30.5 metres, incorporating rooftop plant areas, with internal data hall floor-to-floor heights of approximately 7.5 metres.
- Construction of four data hall buildings arranged centrally within the site, each comprising three storeys, alongside an administration building positioned at the northern frontage.
- Provision of on-site energy infrastructure including fuel cells (located to the east and west of the main building) and electrical substations to support the operation of the data centre.
- Retention and enhancement of existing tree cover along the site frontage, alongside additional landscaping to reinforce the established green character of Thames Valley Park and soften the appearance of the development.
- Creation of a secure perimeter boundary incorporating appropriate stand-off distances and a combination of fencing and landscape treatment to balance security requirements with visual integration.
- Provision of a central internal access road and circulation network designed to accommodate servicing, maintenance and emergency vehicles, including articulated lorries.

- Provision of 72 car parking spaces (including accessible spaces) located to the front of the administration building to support operational staff requirements.
- Connection to the electricity grid via an on-site substation, with alternative power strategies including a 33kV or 132kV connection currently under consideration as part of a phased approach to energy supply.
- The data centre will operate on a continuous 24-hour basis, reflecting the operational requirements of mission-critical digital infrastructure.

5. Surface Water Drainage Proposals

5.1 Design Criteria

Drainage systems will be designed in accordance with the following standards:

- Design and Construction Guidance (DCG) (2020)
- CIRIA Report C609 - Sustainable Drainage Systems
- National Planning Policy Framework and Technical Guide
- BS EN 752:2008 Drain and Sewer Systems Outside Buildings

The key design criteria are:

- No surcharging of the drainage system during the 1 in 2-year return period storm.
- No flooding on site up to the 1 in 30-year storm event;
- No flooding which may pose a significant risk to people and property from a 1 in 100-year storm (including a 40% allowance for climate change);
- Sewers laid in highways should have a minimum cover of 1.2m. Sewers laid in locations other than the highway should have a minimum cover depth of 0.9m. Where this is not achievable special protective measures may be required;
- Rainfall intensities will be increased by 40% in line with Environment Agency guidance to account for the predicted effects of climate change.

5.2 Existing Surface Water Discharge rate

Rainfall data has been obtained from Flood Estimation Handbook (FEH) Web Version (FEH13) to determine approximate existing discharge rates at the Site. The 30-minute and 60-minute storm durations were used within these calculations as typical duration storm events and the Rational Method applied:

$Q = 2.78 CIA$, where;

Q = flow (l/s);
 C = runoff coefficient (1);
 I = rainfall (mm/hr); and
 A = catchment area (ha).

The existing brownfield run-off rate has been calculated as 13.5l/s using the rational method (1 in 100-year, 30-minute critical storm period). It should be noted that this is theoretical discharge rate, and the site existing discharge is likely restricted by the pipe capacity of the existing drainage connections.

The size, number, and depth of existing connections from the current 3no. buildings and surrounding hard and soft landscaped areas to the public sewer network is unknown at this stage but should be verified to validate existing runoff rates from the site. A below ground utility survey should be completed ahead of the next design stage to confirm the size and depth of the existing drainage network.

5.3 Catchment Areas

An assessment of the existing and proposed permeable and impermeable areas across the Site has been undertaken to inform the surface water drainage strategy and greenfield/brownfield runoff calculations. The existing Site area is approximately 5.4 ha and comprises a combination of hardstanding (building roofs, car parking and access roads) and soft landscaped areas.

The ratio of permeable and impermeable areas is similar for the existing and proposed Site. The area of permeable and impermeable area for the proposed Site will be refined in line with design development. A summary of the existing and proposed permeable and impermeable areas is provided in Table 3 below.

Table 3 Existing and Proposed Impermeable and Permeable areas

Scenario	Total Area (ha)	Impermeable Area (ha)	Permeable Area (ha)
Existing Site	5.4	3.8	1.6
Proposed Site	5.4	3.8	1.6

5.4 Proposed Discharge Rates

Wokingham Borough Council Local Plan require that all development sites limit their peak rate of surface water run-off to the greenfield rate, as far as is practicable. Greenfield runoff rates (GRR) have been obtained for the Site using the UK SuDS greenfield runoff estimation tool⁸ in accordance with the FEH statistical methodology

Greenfield runoff rates are provided for the 1 in 1-year, 1 in 30-year and 1 in 100-year in Table 4 and have been calculated for a total catchment area of 5.4 ha. The calculations to determine the greenfield runoff rate calculations are provided in Appendix B.

Table 4 Greenfield runoff rates

Return Period (years)	Flow rate (l/s)
1 in 1	3.0
1 in 30	8.2
1 in 100	11.4

The proposed discharge rate to the Thames Water combined sewer will be restricted using flow control devices in the penultimate surface water manholes. The total proposed discharge rate from the Site of 13.5 l/s for all rainfall events up to the 1 in 100-year event + climate change. This aligns with the 1 in100-yr greenfield runoff rate.

5.5 Climate Change

NPPF Guidance stipulates that to allow for the predicted impacts of climate change on surface water runoff, an increase to peak rainfall intensity should be applied.

Table 5 is an extract from the updated government guidance in relation to climate change allowances for the Thames and South Chilterns Catchment for the 1% annual exceedance event. For development with a lifetime beyond 2100 the upper end allowances should be assessed at both the 1% and 3.3% annual exceedance probability events for the 2070s epoch.

⁸ www.uksuds.com

Table 5 Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Annual Exceedance Probability Event	Allowance	Total potential change anticipated for the '2050s' (Development lifetime up to 2060)	Total potential change anticipated for the '2070s' (Development lifetime 2061 to 2125)
3.3%	Upper end	35%	35%
3.3%	Central	20%	25%
1%	Upper end	40%	40%
1%	Central	20%	25%

The development should be designed for the upper end allowance in the 1% annual exceedance probability event. Therefore, in accordance with the NPPF, an allowance of 40% for the effects of climate change to the year 2125 should be applied to achieve the policy requirements for the proposed redevelopment. This will provide resilience to the proposed Site against the anticipated changes in rainfall patterns.

5.6 Proposed Surface Water Strategy

Stormwater within the hardstanding catchments will be collected within the proposed stormwater drainage network through a combination of gullies and drainage channels. Roof catchments are to be collected and discharged to the proposed surface water network through rainwater down pipes. The ambition of the surface water drainage is to convey flows entirely through gravity, this approach will be validated once detailed landscaping levels are available at a later design stage. An initial storage estimate of 2750m³ is required to attenuate the site-wide impermeable catchment for the site greenfield runoff rate. This was determined through a MicroDrainage Source Control model.

Following the comparison exercise between pre-development and post-development catchment types for surface water in Section 5.3, there will be no change in the surface water discharge rate from pre-development to post-development.

As identified in Section 3, the entirety of the existing site catchment is discharged to a private sewer network. The owner of the private sewer network is currently unknown; to assist identifying the owner Thames Water are to be engaged. Whilst it is assumed that the private sewer network has sufficient capacity of accommodate the current discharge rates and volumes, this is to be confirmed following the confirmation of ownership of the private sewer network.

Figure 9 outlines a proposed surface water drainage network. The proposed network utilises the existing discharge points into the private sewer network.

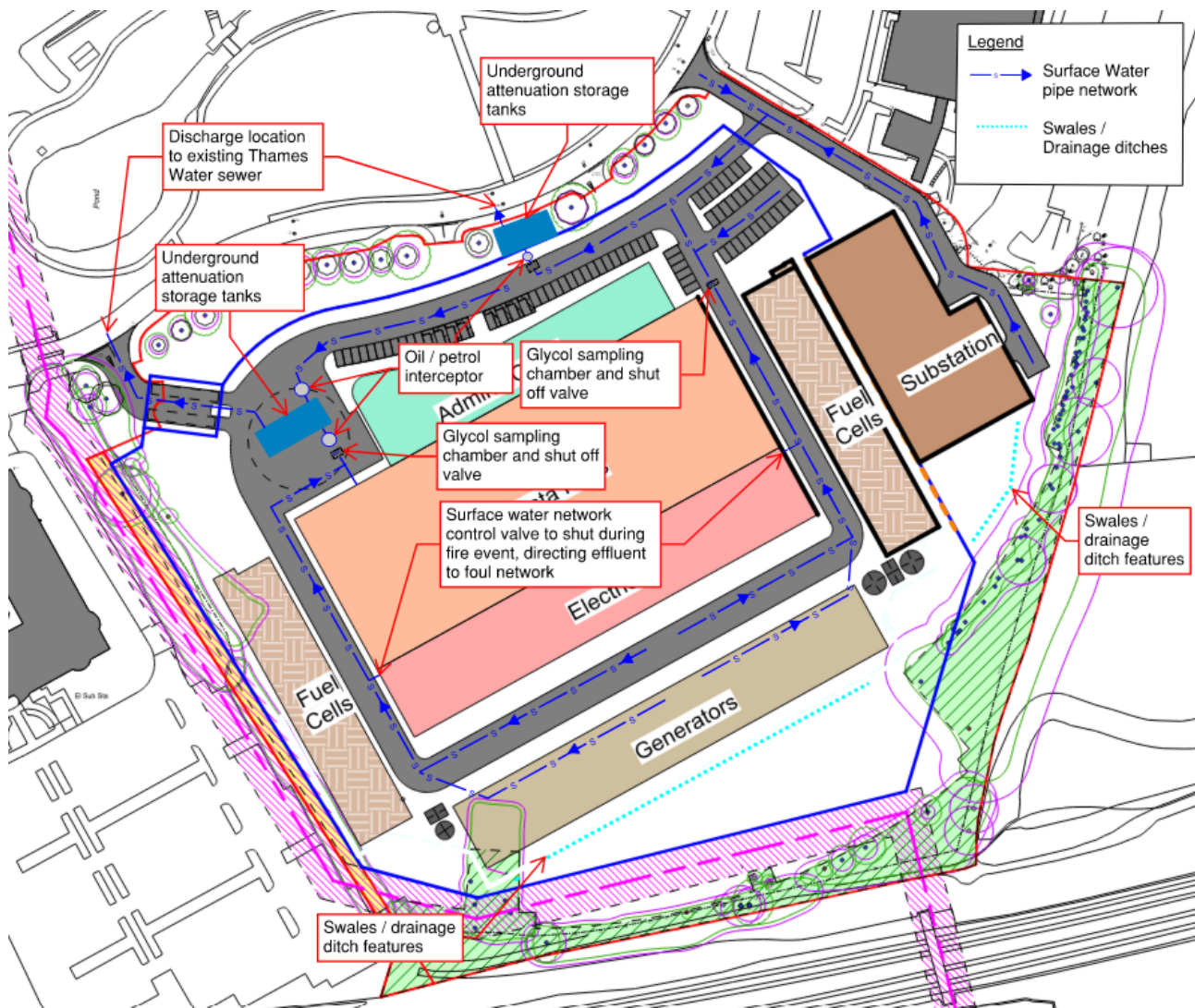


Figure 9 Proposed surface water drainage network

5.7 Opportunities for SuDS

The NPPF (Chapter 18) policy F8 states that Sustainable Drainage Systems (SuDS) should be utilised, where possible, within all new drainage schemes. SuDS generally replicate the natural drainage patterns of the undeveloped Site allowing infiltration into the ground (where feasible) and controlling outflow rates from the development. This reduces the impact and risk of flooding on downstream developments and can provide additional benefits such as pollution control, increased biodiversity, and provision of water-based amenity space.

Table 6 below provides a detailed Site-specific assessment of the suitability of a variety of SuDS considered within the proposed surface water drainage strategy.

Table 6 Sustainable Drainage Systems suitability appraisal

SuDS Type	Site Suitability	
Blue Roof	A roof specifically intended and designed to store water. This can be via open water surfaces, storage within or beneath porous medium or modular surfaces, within shallow geo-cellular crates or below a raised decking/impermeable surface.	
	Advantages	Disadvantages
	No additional land take making them effective within dense urban Sites and can contribute significantly to overall Site attenuation requirements.	Additional weight and cost to structure (compared to normal roof design). Damage to waterproof membrane can be critical. Does not always provide treatment dependent on system.
<i>Site Suitability</i>	Data centre halls not suitable for blue roofs in consideration of risk of water leakage, structural cost on large spans, suitability of locating equipment in glycol leakage events.	
Green Roof	Multi-layered system that covers the roof of a building with vegetation/landscaping over a drainage layer. Designed to intercept and retain rainfall, reducing the volume of runoff and attenuating peak flows. Typically, either defined as intensive or extensive systems depending on the nature of the selected flora.	
	Advantages	Disadvantages
	Mimics greenfield state of building footprint for high density developments, good removal of pollutants, ecological benefits, insulates buildings, sound absorption.	Additional weight, not appropriate for steep roofs, maintenance of roof vegetation. Damage to waterproof membrane can be critical.
<i>Site Suitability</i>	Architect to investigate opportunities to design green roofs on data centre operational / amenity facilities. Location must not interfere with the data centre operation.	
Rainwater Harvesting	The collection of rainwater (usually within underground storage tanks) for later re-use in either buildings (treated), wash down facilities (commercial) or irrigation.	
	Advantages	Disadvantages
	Can provide source control of storm water runoff, reduces demand on mains water.	Use is dependent on demand requirements, contributing surface area, and seasonal rainfall characteristics
<i>Site Suitability</i>	Rainwater harvesting unlikely to meet building greywater demands. However, there is an opportunity to subsidise incoming potable water demand.	
Infiltration Systems/ Soakaways	Any system which stores and discharges water directly to the underlying soils. These are typically soakaways, infiltration trenches, infiltration basins or infiltration blankets.	
	Advantages	Disadvantages
	Provides groundwater recharge, ease of construction and can have minimal land take subject to design. Manages surface water at source.	Increased risk of groundwater ingress and pollution. Not suitable for poor draining soils or where infiltrating water may pit structural foundations at risk. Uncertainty over long term performance. Requires comprehensive geotechnical knowledge of underlying soils.

SuDS Type	Site Suitability	
Site Suitability	Infiltration systems / soakaways to be investigated near highway infrastructure and proposed landscaped areas. Not to be included in the vicinity of the data centre building footprint.	
Swales	Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate.	
	Advantages	Disadvantages
	Can be incorporated into landscaping proposals, offers good removal of pollutants, and reduces runoff rates and volumes. Relatively low cost.	Not suitable for steep areas and requires significant land take (not suitable for high density urban Sites). Not suitable in areas with roadside parking.
Site Suitability	Considerable proposed topographical falls coincide with available land take areas.	
Filter Drains	Filter drains are shallow trenches filled with stone/gravel that accept runoff through sheet flow and provide temporary subsurface storage (typically provided adjacent to highways or as interception features). They can drain via infiltration or be lined and positively drained via a perforated collection pipe.	
	Advantages	Disadvantages
	Hydraulic benefits achieved with filter trenches; trenches can be incorporated into Site landscaping and fit well beside roads and car parks.	High clogging potential without effective pre-treatment, limited to small catchments, high cost of replacing filter material.
Site Suitability	Filter drains to be investigated by proposed car parks and highway infrastructure.	
Bio-retention Systems/Rain Gardens	Shallow planted features, which receive runoff directly from adjacent hardstanding. Typically, under drained, surface water will infiltrate to the underlying piped drainage system and in doing so promote storage, plant up-take and filtration.	
	Advantages	Disadvantages
	Easily incorporated into soft landscaping, flexible shape and planting mix and provide good degree of storage (reducing the below ground requirement). High degree of pollutant removal and high biodiversity potential. Reduces need for surface drainage (gullies, channels etc) and low cost.	Requires considered use of water tolerant plant species and landscaping & management. Susceptible to clogging if poorly managed and not suitable for steeply sloping Sites.
Site Suitability	Suitable external areas around car park and highway infrastructure to be considered	
Tree Pits	Tree pit systems generally accept sheet runoff from adjacent hardstanding areas in the same manner as bio-retention systems. They can be used in urban settings and provide a range of aesthetic benefits.	
	Advantages	Disadvantages
	Easily incorporated into soft landscaping with high degree of pollutant removal and high biodiversity potential. Reduces need for surface drainage (gullies, channels etc) and low cost.	Limited tree species/size depending on system and requires careful co-ordination with services due to root spread
Site Suitability	Tree pits should be incorporated in the landscape design at the next design stage.	
Permeable Pavements	Pavements that allow rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored before infiltrating the ground (unlined) or discharging to the sewerage system (lined).	
	Advantages	Disadvantages
	Provides low-level treatment of highway-derived pollutants (as recognised by the EA) and reduces need for surface drainage	Often requires increased construction depth and not suitable for use with Type 1 sub-base. May not be applicable for heavy traffic loadings and irregular

SuDS Type	Site Suitability		
	(gullies, channels etc). Available in a range of surface types (not just block paving).	maintenance required in certain situations. Not suitable for utility routes.	
Site Suitability	Suitable external areas such as the car parking areas, that are not in the vicinity of oil / petrol filling areas, should be explored.		
Detention Basins	Detention basins are surface storage basins that provide flow control through attenuation of storm water runoff. They facilitate settling of particulate pollutants. Typically dry, they can also offer multi-functional recreational use.		✗
	Advantages	Disadvantages	
	Can cater for a wide range of rainfall events, easy to maintain, potential for dual land use, can be incorporated in to landscaping proposals and low cost.	Not suitable for steep areas, significant land take and little reduction in runoff volume	
Site Suitability	Suitable external area to include this feature is not available		
Ponds	Ponds can provide both storm water attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline.		✗
	Advantages	Disadvantages	
	Good removal capability of urban pollutants, high potential ecological, aesthetic and amenity benefits, can cater for all storm events and good community acceptability.	No reduction in runoff volume; Anaerobic conditions can occur without regular inflow; Significantly land take; No suitable for steep Sites;	
Site Suitability	Suitable external area to include this feature is not available		
Sub-Surface/Geo-cellular Storage	Oversized pipes, tank systems and modular geo-cellular systems that can be used to create a below ground storage structure.		✓
	Advantages	Disadvantages	
	Modular and flexible, dual usage (infiltration/storage, high void ratios, can be installed beneath trafficked and soft landscaped areas.	No water quality treatment.	
Site Suitability	Geo-cellular storage most favourable attenuation option in consideration of site constraints.		
Rills/Canals	Formal linear drainage features in which surface water can be stored or conveyed. They can be incorporated with water features such as ponds or waterfalls where appropriate.		✗
	Advantages	Disadvantages	
	Negate the need for underground pipework. Can provide some attenuation. Possible reduction in runoff volume via plant uptake and infiltration.	Potential trip/wheel hazard, disabled access issues.	
Site Suitability	Suitable external area to include this feature is not available		

5.7.1 SuDS Selection Summary

Further to the assessment above, Table 7 provides a summary of SuDS that are considered viable within the context of the proposals, SuDS where opportunities to implement should be explored at detailed design stage and SuDS which are not appropriate for the proposals due to spatial constraints and existing ground conditions:

Table 7 SuDS Selection Summary

SuDS Type	Site Suitability		
	Suitable for consideration on Site	Further consideration to be carried out during detailed design	Not suitable for consideration on Site
Blue Roof			×
Green Roof	✓		
Rainwater Harvesting	✓		
Infiltration Systems/Soakaways	✓		
Swales	✓		
Filter Drains	✓		
Bio-retention Systems/Rain Gardens	✓		
Tree Pits	✓		
Permeable Pavements	✓		
Detention Basins			×
Ponds			×
Sub-surface Storage	✓		
Rills/Canals			×

The initial design concept for each SuDS type appraised as suitable for consideration on site is outlined below.

5.7.2 Green Roof and Rainwater Harvesting

The data centre admin / office building is located on the northern side of the data centre building, as shown in Figure 10. Data Centre building roofs are typically flat which promotes the feasibility of a green roof. Loading restrictions will be explored further at the next design stage to assess the available storage volume.

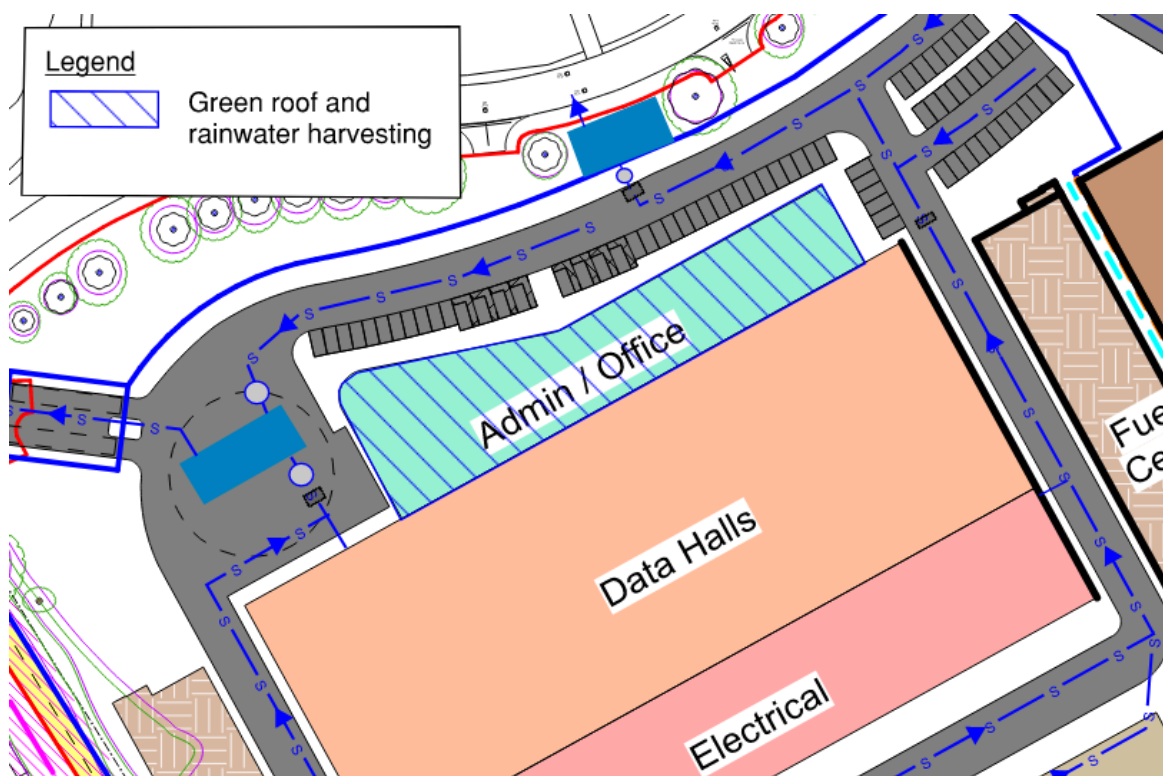


Figure 10 Green roof and rainwater harvesting opportunities

5.7.3 Infiltration Systems/Soakaways and Swales

The landscape design includes areas of soft scaping around the perimeter of the site boundary. For these extents, the proposed drainage strategy seeks to provide an infiltration-led drainage solution. It is proposed that features such as swales, drainage ditches and soakaway systems are arranged to retain the surface water runoff on the soft scaping catchment in larger storm events. The location of these SuDS will be confirmed in the next design stage and consider the proposed topography. The ability to promote infiltration within these areas will reduce the size of the on-site attenuation storage and alleviate capacity requirements on the existing TWUL network.

5.7.4 Rain Gardens and Tree Pits

Rain gardens and tree pits could be utilised within the vehicle car park, north of the data centre building. The location of rain gardens and tree pits would need to be coordinated to avoid proposed utility corridors.

Rain gardens provide a high degree of pollutant removal and high biodiversity potential. The degree of pollutant removal can be calculated at the next stage, once the raingardens are sized.

The volume of attenuation provided in the rain gardens is to be determined at the next design stage with the landscape architect. Attenuation in the rain gardens will likely reduce the size of the attenuation tanks.

5.7.5 Permeable Pavements

Permeable pavements are to be explored in all non-oil refuelling locations such as the worker car park and access roads around the perimeter of the data centre building, as shown in Figure 11. Permeable paving provides upstream attenuation and will reduce the size of below ground attenuation tanks.

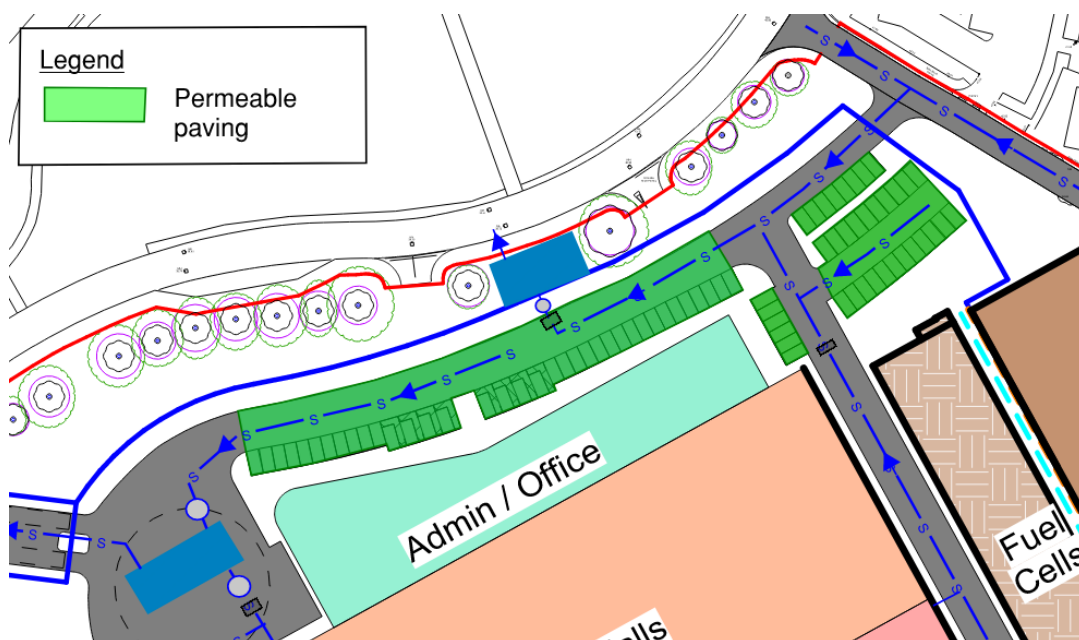


Figure 11 Permeable pavement opportunities

5.7.6 Sub-surface Storage

In consideration of the site extents and proposed infrastructure, there is no available space for a surface-level pond or detention basin. Sub-surface storage is proposed in the form of attenuation tanks. These are to be located beneath the access roads and landscaped areas and are to be coordinated alongside below ground utilities and landscape planting.

An initial total storage volume of 2750m³ has been calculated by applying MicroDrainage modelling software. This has been determined by considering the impermeable catchment area during a 1 in 100-year + 40% uplift for climate change, discharging at the site-specific greenfield runoff rate.

5.8 Compliance with Wokingham SuDS Strategy

In accordance with Wokingham Borough Council's Sustainable Drainage Systems (SuDS) Strategy (2017) and associated local standards, development proposals should ensure that surface water run-off is managed as close to its source as possible, mimicking natural drainage processes. There should also be a preference for surface (green) SuDS features over proprietary engineered (grey) solutions, in line with the following drainage hierarchy⁹:

1. Discharge into the ground (infiltration); or where not reasonably practicable,
2. Discharge to a surface water body; or where not reasonably practicable,
3. Discharge to a surface water sewer, highway drain, or another drainage system; or where not reasonably practicable,
4. Discharge to a combined sewer.

Where a lower-priority discharge route is proposed, justification must be provided demonstrating that all higher-priority options have been assessed and are not reasonably practicable¹⁰. In addition, at least one surface SuDS feature must be incorporated within the management train, with proprietary pollution control devices (e.g. vortex separators, filter screens) only used as a last resort where surface features are demonstrated as not viable¹¹. Design comments relevant to the proposed development are outlined against the Wokingham SuDS hierarchy in Table 8.

Table 8 Wokingham SuDS Hierarchy

Hierarchy	Surface Water Management	Considered Within Design (Yes/No)	Design Comments
1	Discharge into the ground (infiltration)	Yes	Infiltration will be promoted where possible throughout the site. Landscaped areas are to be infiltrated, and drainage opportunities such as permeable paving and tree pits are to be considered during design development.
2	Discharge to a surface water body	No	There are no existing surface water bodies in the vicinity of the Site.
3	Discharge to a surface water sewer, highway drain, or another drainage system	No	It is currently understood that the existing surface water network discharges to a combined sewer. There is a no surface water sewer in the vicinity of the site.
4	Discharge to a combined sewer	Yes	Catchments that are at risk of exposure to hazardous leak substances cannot be infiltrated. This is due to the risk of groundwater contamination risk and instead will be discharged to the surface water sewer network. Refer to Section 5.11 for water quality.

⁹ Wokingham Borough Council - WokBC-LS41

¹⁰ Wokingham Borough Council - WokBC-LS42

¹¹ Wokingham Borough Council - WokBC-LS49

5.9 Modelling Results

The 'cascade function' within Source Control in MicroDrainage has been used to model the below ground attenuation for the total impermeable site catchment. The 1:100-year +40% climate change event has been used to determine the attenuation required when discharge is restricted to 13.5l/s

The flow is modelled through the attenuation tank storage to determine the area and depth of storage required. The MicroDrainage modelling results are shown in Appendix C.

An InfoDrainage Network Model will be developed at RIBA stage 3 to ensure that the pipe network meets the design criteria described in Section 5.1.

5.10 SuDS Management Plan

The drainage networks have been designed to adoptable standards (in accordance with Design and Construction Guidance Appendix C and Part H Building Regulations). At this stage, it is anticipated that the on-site surface water drainage and SuDS features will be managed and maintained by a private management company. It is likely that the maintenance regime for drainage features will be integrated with the landscaping maintenance schedule.

Table 9 to Table 11 outline the advised maintenance requirements for the various elements of the proposed drainage strategy, which have been informed by the guidance outlined within CIRIA C753 and current best practice.

These tables are minimum requirements and are intended to form the basis of a final detailed maintenance strategy document produced by the maintenance team. The following information would also be supplemented by manufacturer's specifications and be dependent on the specific type of system/products used. The tables below are not exhaustive and the introduction of further drainage apparatus through design development would include apparatus-specific operation and maintenance requirements.

Table 9 Operation and Maintenance Requirements for Drainage Pipes

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from inspection chambers and flow control chambers	Annually
	Cleaning of gutters and any filters on downpipes	Annually
	Remove any root ingress	As required
Occasional Maintenance	CCTV survey of drains to check alignment, cracking and joint displacement	10-year intervals

Table 10 Operation and Maintenance Requirements for Attenuation Tanks

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents.	As required

Maintenance Schedule	Required Action	Frequency
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually

Table 11 Operation and Maintenance Requirements for Tree Pits

Maintenance Schedule	Required Action	Frequency
Regular Inspections	Remove litter and debris.	Monthly (or as required)
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required)
	Inspect inlets and outlets.	Inspect Monthly
Regular Maintenance	Check tree health and manage tree appropriately	Annually
	Remove silt build-up from inlets and surface and replace mulch as necessary.	Annually, or as required
	Water	Annually, or as required
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly

5.11 Water Quality

This section outlines several strategies proposed as part of the development to ensure the water quality discharging from the proposed development is in accordance with the relevant legislation.

5.11.1 Glycol containment strategy

The data centre projects require glycol to operate. If not appropriately contained, glycol, in high concentrations, can be damaging to local watercourses and surrounding environment. There is a risk of a glycol leak within a data centre, and a glycol solution entering the surface water network and discharging into the local sewerage network. This section outlines the proposed strategy to prevent glycol solution from flowing outside of the site boundary.

To capture any glycol solution, a sampling chamber with shut-off valve is proposed upstream of all attenuation features, as shown in Figure 12. These valves will shut following the detection of a glycol leak within a data centre, the glycol solution will be redirected into the foul sewerage network and be collected in the fire effluent storage tank. This will prevent any glycol solution entering the attenuation storage.

Following the resolution of the glycol leak, any glycol solution within the localised surface water network and attenuation storage would be pumped out by vehicular tankers. This would be transported off site for processing, and the affected localised network and storage would then be cleaned appropriately.

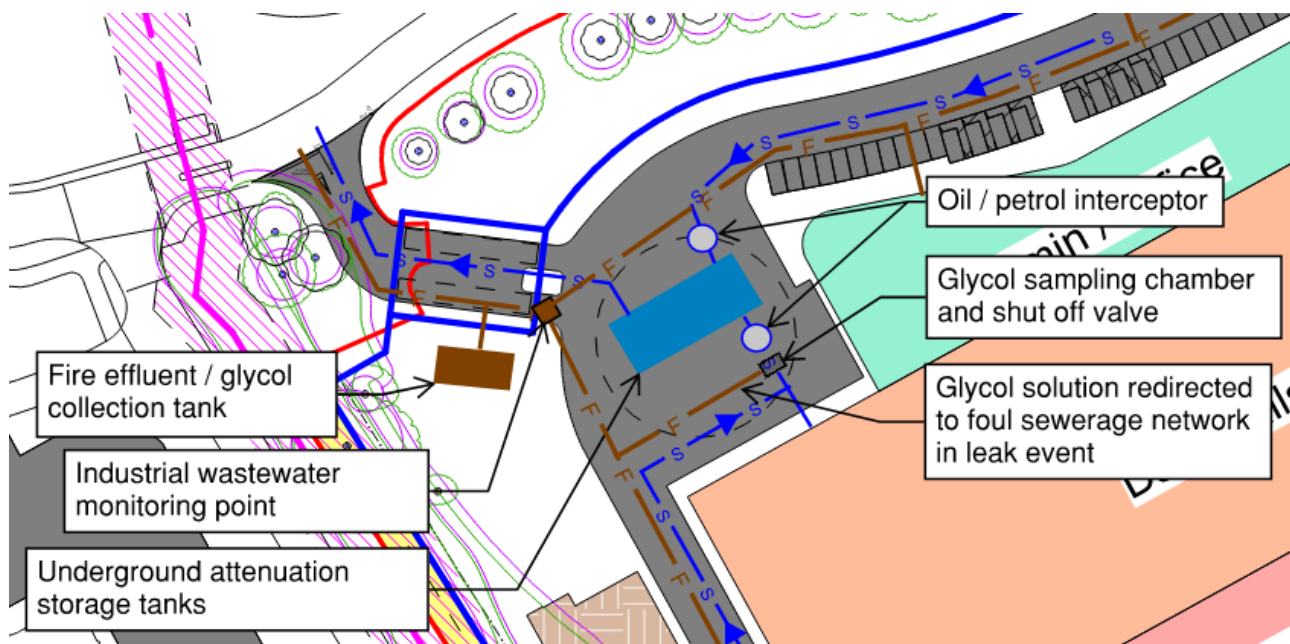


Figure 12 Glycol containment strategy

5.11.2 Fire effluent retention strategy

In the event of a fire within the building, the fire water stored in the data centre is used and discharged via internal drainage to the foul water network. The required volume of fire water is dependent on the affected compartment in the data centre and should be confirmed at the next design stage. It should be noted that the collection gully arrangement in the data centre is outside of this strategy. However, this arrangement will discharge the fire effluent into the site foul sewerage network, as shown in Figure 13.

Fire effluent in the generator yard will be collected by the surface water network. In a fire event, a surface water shut off valve will redirect flow into the foul sewerage network and the effluent will be collected in the collection tank. The probability of a concurrent fire event and storm event is deemed very low. If necessary, the site network can be oversized to provide additional storage to accommodate a fire event and a 1 in 5-year storm period.

A fire effluent collection tank is proposed downstream in site foul sewerage network. This tank should be sized to accommodate the total volume of fire water stored upstream. The collection tank is transported by vehicle for processing off site.

5.11.3 Diesel and Ad-blue isolation strategy

Diesel and ad-blue chemicals are required at fuelling points within the data centre plot. To prevent diesel and ad-blue chemicals entering the local sewerage network, the following examples of provisions should be considered as part of the drainage strategy:

- Self-containment bunds around fuel storage points to be sized to contain a minimum 110% of the diesel / ad-blue stored volume.
- All fuelling points are located on hardstanding, impermeable areas.
- Isolating valves installed immediately downstream of refuelling points to contain AdBlue leakage.
- Petrol / oil interceptors are proposed downstream of all areas that may be susceptible to oil leaks, such as refilling stations and generator equipment. Oil separators will ensure that the water quality of the stormwater discharged to the local sewerage network aligns with drainage authority requirements. All interceptors are located upstream of attenuation storage.

6. Foul Drainage

6.1 Existing Foul Water Drainage

A review of topographical survey information and asset location search sewer maps show 3no. existing foul sewerage connections (2no. 225mm diameter and 1no 150mm diameter foul pipe) to the combined sewer within the access road. There is currently no available information on the invert level of the existing connections. A below ground utility survey will be completed ahead of the RIBA 3 design stage to confirm the depth of the existing drainage network.

6.2 Domestic foul water

The proposed data centre will significantly reduce the number of employees on site from the existing commercial offices; in conjunction, the volumes and discharge rates of domestic foul water from site will reduce. Therefore, it is assumed that the local sewerage network will have capacity to accommodate the domestic foul water volumes for the Thames Valley Park Data Centre.

The proposed domestic foul water network will utilise the existing foul sewerage network connections to the local sewerage network. The proposed building domestic foul water outfall locations are to be confirmed at the next design stage. For the purposes of this strategy, indicative foul water outfall locations are shown on the network. Figure 13 displays the foul water network.

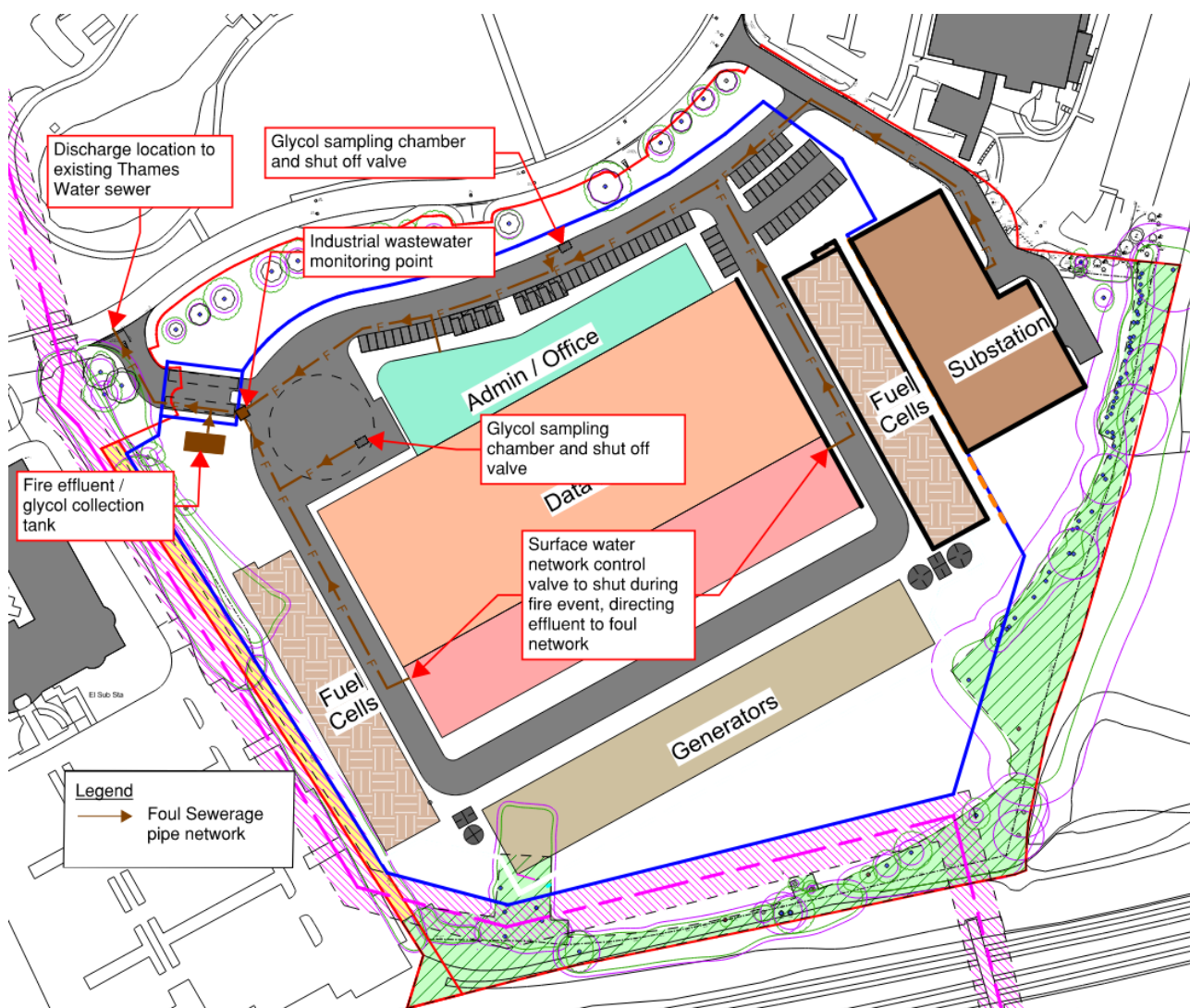


Figure 13 Domestic and Industrial foul water network

6.3 Industrial wastewater

During the operation of the Thames Valley Park Data Centre, the data centre chillers will produce condensate effluent. Condensate effluent is classified as industrial wastewater and can be discharged into the local sewerage network without prior treatment. It should be noted since the existing site does not produce condensate industrial wastewater, Thames Water will need to be consulted, and the project will be required to obtain a trade effluent consent in accordance with the Water Industry Act 1991.

To determine if the existing foul sewerage network can accommodate the industrial wastewater demands associated with a data centre, the volumes from a similar data centre case study have been assessed. This case study obtained planning approval in 2025 and now is under construction. The case study shares multiple similarities to the Thames Valley Park Data Centre, including power demand, geographical location and climate, and will produce approximately 12-15l/s of industrial wastewater during operation. Therefore, it is assumed that Thames Valley Park Data Centre will also produce approximately 12-15l/s of industrial wastewater during operation.

As outlined in Section 3.2.6, the existing site has an existing industrial wastewater strategy, and in consideration of the anticipated industrial and domestic wastewater volumes, it is assumed that the existing network will have capacity to accommodate the Thames Valley Park Data Centre.

Industrial wastewater network includes a monitoring and sampling chamber to ensure wastewater is an appropriate water quality before discharging to the local sewerage network.

7. Flood Risk Assessment

The technical guidance of the NPPF requires flood risk from the following sources to be assessed:

1. Fluvial and tidal sources (flooding from rivers and the sea);
2. Groundwater sources;
3. Artificial sources, canals, reservoirs etc;
4. Pluvial sources (flooding resulting from surface water/overland flows)

In addition, the risk from increases in surface water discharge to be assessed (surface water management). The following section provides a site-specific flood risk assessment of each potential flood source.

7.1 Fluvial and Tidal Risk flood risk

Environment Agency (EA) Flood Maps confirm that the site is wholly located within Flood Zone 1 (FZ1), defined as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%) – very low.

There are areas to the north of the site, coinciding with the location of the River Thames and Caversham Lakes, that have a low-medium fluvial flood risk. It should be noted that the EA considers the climate change scenario, with this inclusion the flood extents still do not reach the site boundary. These are outlined as flood zone 2 and 3 respectively on Figure 14 There are no existing flood defences that benefit the site.

Due to the site location in Flood Zone 1, flooding from breach and overtopping of flood defences is not considered to pose a risk to the site. The Site is therefore at **negligible** risk of fluvial or tidal flooding.



Figure 14 Fluvial flood zone areas

7.2 Pluvial flood risk

There is a risk of pluvial flooding within the extents of the proposed development. Within the existing development, a pluvial flooding risk has been identified in the south-eastern hardstanding corner of the three commercial offices, as shown in Figure 15. The pluvial flood risk at these locations is considered as high risk (greater than 1 in 30 (33%)).

It should be noted that this flooding has been created by the existing commercial offices acting as an obstruction to surface water flows. As part of the Thames Valley Park Data Centre proposal, the existing commercial offices are to be demolished. An effective drainage strategy for the proposed Thames Valley Park Data Centre will address this pluvial flood risk, as outlined in Section 5.6. This will reduce the pluvial flood risk on the site.

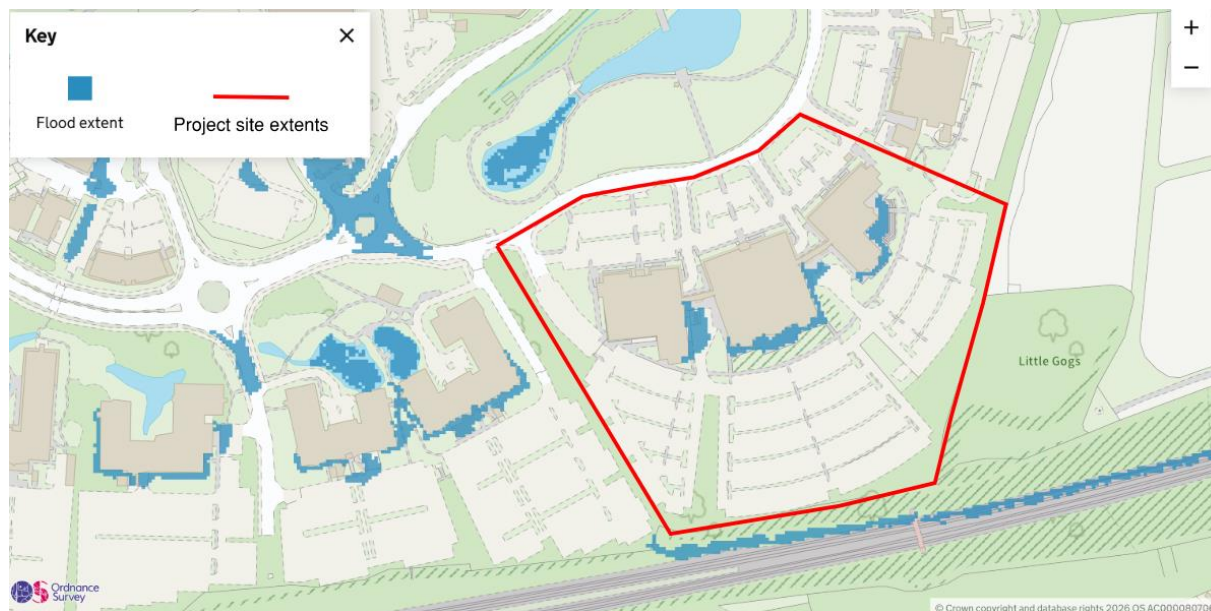


Figure 15 Pluvial flood risk for existing development

7.3 Groundwater flooding

Groundwater flooding occurs when the water table rises above the ground surface and is caused because of unusually high groundwater levels. Groundwater flooding typically lasts for a longer duration in comparison to surface water (pluvial) flooding.

The groundwater within the site extents is considered Moderate and is based on a 1 in 100-year return period. Figure 16 outlines the risk of groundwater flooding within the site extents. This approximately coincides with parts of the site where the superficial deposits are recorded, i.e. land north of the boundary between the southwest corner to the eastern site boundary. Land of south of this is mapped as being at low or negligible risk from groundwater flooding.

Consideration should be given in the design to the surface levels and layout to mitigate risk of groundwater being contained and causing flooding on the site.

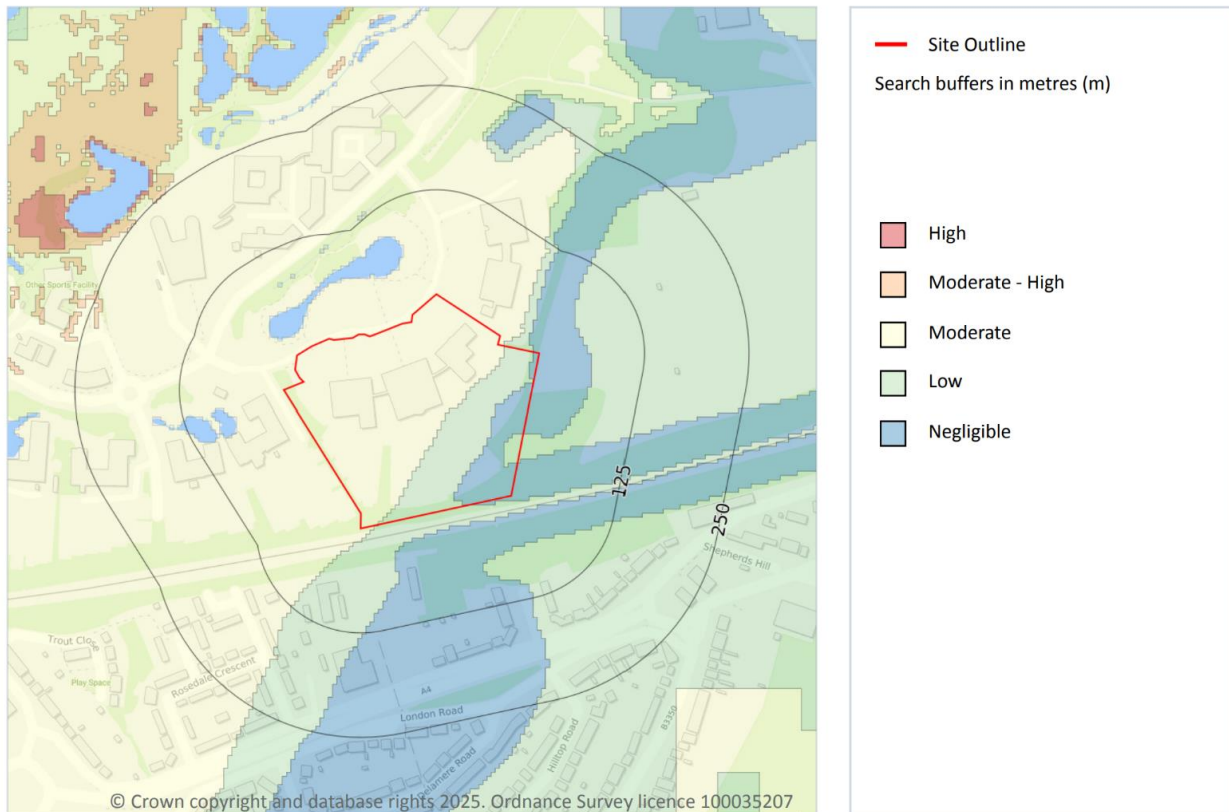


Figure 16 Groundwater flooding¹²

7.4 Flooding from Artificial Sources

In general, reservoir flooding is extremely unlikely to occur and there has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the EA ensures that reservoirs are inspected regularly, and essential safety work is carried out.

EA flood maps confirm that the Site is not at risk of reservoir flooding and there are no canals or other artificial sources which will influence flooding at the Site.

There is one potable water main within the access road, north of the proposed development. Following a review of the existing topographical survey, in the scenario of a water leak any overland surface water will flow north, away from the proposed development and not introduce any flooding.

There is an existing 300mm diameter potable water trunk main within the southern extents of the proposed development. In the event of a pipe leak, runoff water to convey north towards the proposed development. However, in consideration of the proposed site levels the proposed surface water drainage network would capture and convey the leak water before reaching critical data centre infrastructure. As a result of the above, the risk of flooding from artificial sources is low.

Both existing potable water mains are shown schematically in Figure 17.

¹² Groundsure report, dated 25 August 2025

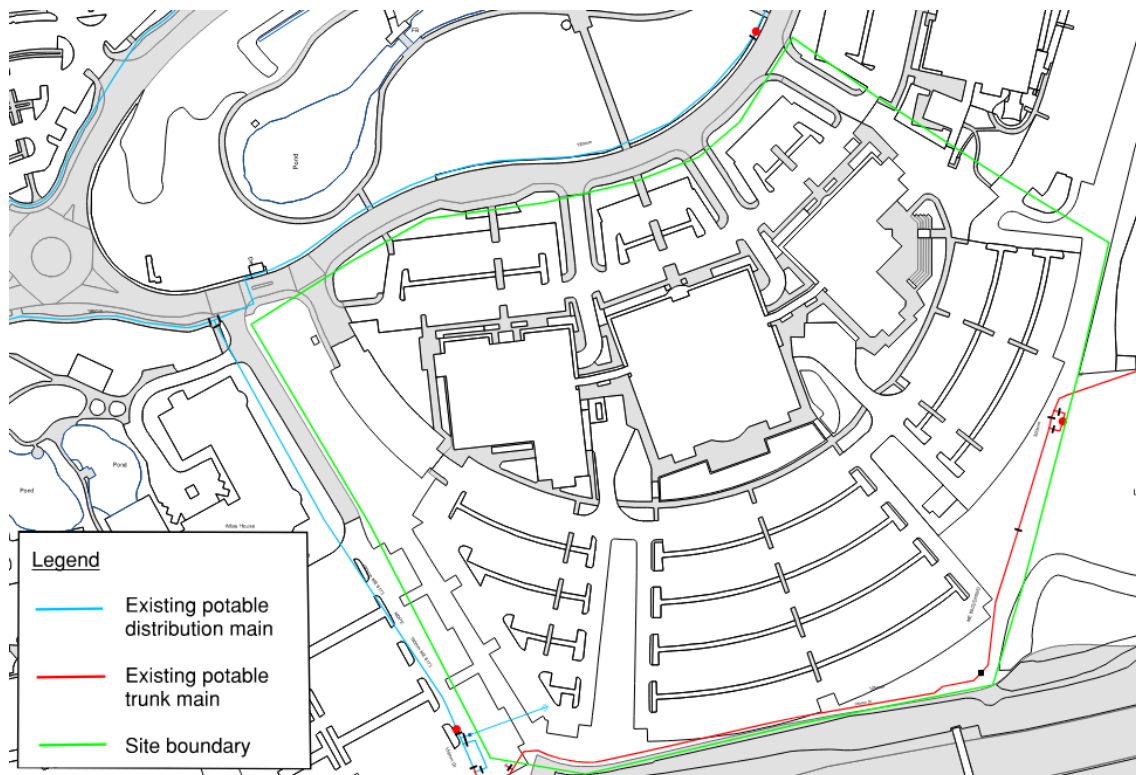


Figure 17 Existing potable water mains

7.5 Sewer Flooding

Thames Water are responsible for the management of drainage networks across the Wokingham Borough. A record of flooding incidents relating to public foul, combined or surface water sewers from January 2000 to May 2022 has identified a total of 48 flooding related incidents within the postcode area (RG6 1) coinciding with the location of the Site. The distribution of incidents across the years recorded is shown in Table 12

Table 12 Sewer flooding incidents recorded by Thames Water (Postcode RG6 1)

Number of recorded incidents (year)					
2022	2021	2020	2019	2000-2019	Total flooding incidents
0	5	5	4	34	48

7.6 Flood Risk Summary

A summary of flood risk is provided in Table 13, following the above assessment from all sources.

The level of risk* is defined as low, medium, or high and as described by the following:

Low: Probability of flooding is low-negligible and risk to people or property should not form a material consideration for development. There is little or no residual risk.

Medium: Whilst probability of flooding is low, residual risk to people or property may be severe and require the development proposals to consider mitigation or further investigation. Mitigation may include flood resilience measures or protection of key infrastructure.

High: Flooding is likely to occur and should be specifically addressed as part of the development proposals. There is a significant risk to people or property, and a flood management plan, evacuation plan/safe refuge plan or permanent flood prevention measures should be provided. May require further modelling, investigation, survey or consultation with LLFA/EA/Drainage Authority.

Table 13 Flood risk summary

Flood Source	Pathway	Comment	Risk
Fluvial and Tidal	River Thames 600m to the north of the Site	EA flood maps confirm the Site is entirely located within Flood Zone 1.	Negligible / Not at risk
Groundwater	Through underlying strata when groundwater levels rise above surface levels.	Groundwater flood risk is identified as moderate within the site extents. The drainage and external levels strategy should therefore consider potential groundwater emergence and avoid creating low points where groundwater could be contained. However, as the proposed development does not include a basement the risk is low.	Low with suitable mitigation (as needed)
Artificial Sources	No reservoirs or other artificial sources within site environs.	EA flood maps show that the site is not at risk of reservoir flooding.	Negligible/Not at risk
Pluvial	Overland flow or overloading of existing sewers. Generally, at topographic low points.	High pluvial flood risk is identified around the existing south-eastern hardstanding areas, caused by the existing buildings obstructing surface water flow. Demolition of the offices and the proposed drainage strategy will reduce this risk. The development surface water drainage strategy reduces the pluvial flood risk to low.	Low with suitable mitigation (as needed)
Infrastructure Failure	Burst water main inundating local sewer network	Multiple small water mains in adjacent road networks. No large infrastructure features have been identified in the local area. There are no basement structures proposed as part of the development. In the event of a burst water main, the surface water network will collect and convey runoff away from all critical infrastructure.	Low with suitable mitigation (as needed)

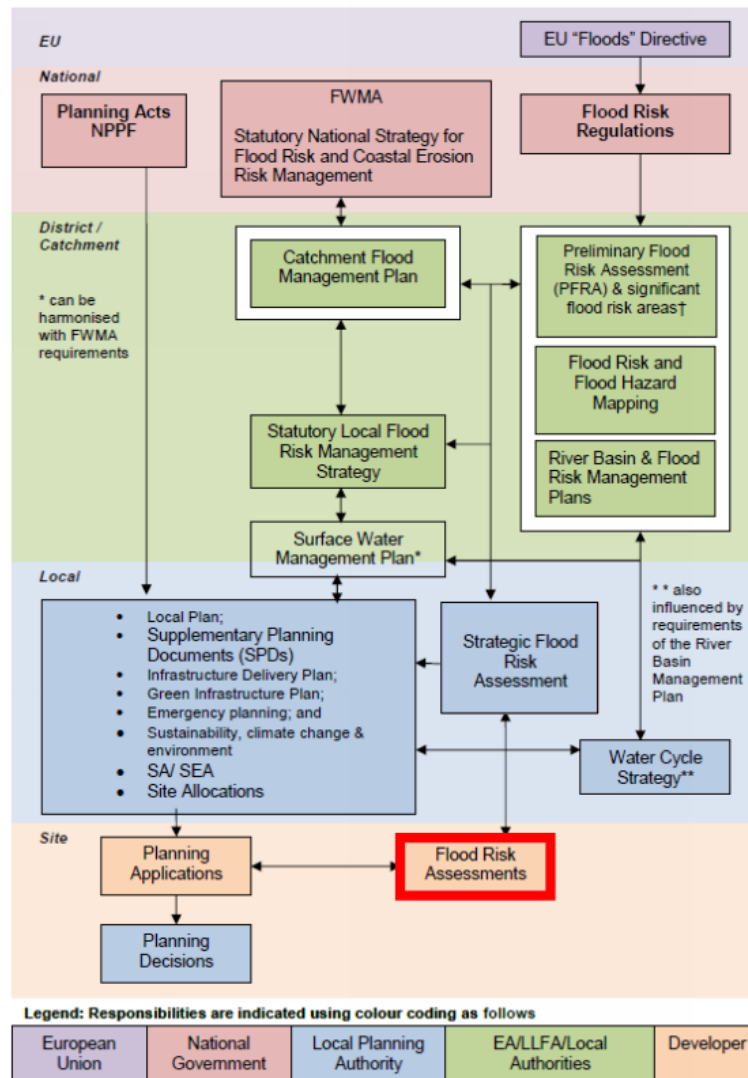
8. Conclusion

This Flood Risk Assessment is based on a review of published data and hydraulic calculations. The following points are considered pertinent to the proposed development's suitability for this Site:

- The Site is located within Flood Zone 1.
- Flood risk from fluvial/tidal, pluvial, groundwater, artificial sources and infrastructure failure are all considered to be low or negligible.
- In accordance with the requirements of Chapter 18 of the NPPF, consideration has been given both to flood risk to the Site and to potential offsite flood risk as a result of the proposed development.
- Surface water runoff from the Site will be restricted to a total of 13.5 l/s, the Site greenfield runoff rate.
- Based on our understanding of the Site setting and the proposals, it is considered that the development can be constructed and operated safely and will not increase flood risk elsewhere.

Appendix A – National Legislation, Regulations and Guidance

The overarching aim of development and flood risk planning policy in the UK is to ensure that the potential risk of flooding is considered at every stage of the planning process. The following diagram outlines the key planning policy for flood risk management and associated documents.



A.1 International Planning Policy

A.1.1 Water Framework Directive (2000/60/EC)

The Water Framework Directive (WFD) sets out objectives prioritising future water protection across the European Union, with the aim of achieving improvements in the quality of polluted water bodies and maintaining the quality of clean water bodies.

Member states were required to transpose the Water Framework Directive (WFD) into domestic law by December 2003. This took place in England and Wales through the WFD England and Wales Regulations 2003 (WFD Regulations). In the UK, the Environmental Agency (EA) is the ‘competent authority’ under the WFD Regulations.

Member water bodies are categorised as: ‘rivers’; ‘lakes’; ‘transitional waters’; ‘coastal waters’; or ‘groundwaters’. Each is identified within each category as being ‘at risk’; ‘probably at risk’; ‘probably not at

risk'; or 'not at risk' of failing WFD objectives with regard to 'water abstraction and flow regulation'; 'physical or morphological alteration'; or 'alien species'.

Under the WFD Regulations, each river basin district must have a river basin management plan in place which sets out environmental objectives for the district and a programme of measures to be applied in order to achieve those objectives. Water in rivers, estuaries, coasts and aquifers will improve as a result of the measures set out in the river basin management plans.

A.1.2 EU Floods Directive (2007/60/EC)

The aim of the Directive is to provide a consistent approach across the European Union to reducing and managing the risks posed by flooding to human health, the environment, cultural heritage and economic activity. The Floods Directive is to be delivered in conjunction with the objectives of the Water Framework Directive (2000/60/EC) to deliver a better water environment through river basin management.

In the UK, the Floods Directive is transposed into law via the Flood Risk Regulations by setting out the duties of local government in assessing flood risk to their area.

A.2 National Policy and Guidance

A.2.1 Environmental Permitting Regulations (2016)

The Environmental Permitting Regulations 2016 consolidate and replace the 2010 Regulations and subsequent amendments. The permitting regime covers a range of activities that release emissions to land, air and water, or that involve waste.

Schedule 21 relates to water discharge activities and Schedule 25 relates to flood risk activities. Schedule 22 relates to groundwater activities, and the regulations place a duty on regulating authorities to implement the Water Framework Directive.

A.2.2 The Water Resources Act (1991) and Water Acts (2003, 2014)

The Water Resources Act 1991 provides legislation for the control of the pollution of water resources. Under this Act, offences of polluting controlled waters occur if a person knowingly permits any poisonous, noxious or polluting matter or any solid waste matter to enter any controlled waters. The Water Resources Act 1991 also provides an all-embracing system for the licensing of the abstraction of water for use, which is administered by the EA. The Water Acts (2003, 2014) modernise water legislation and amend the Water Resources Act 1991 to improve long-term water resource management.

A.2.3 Flood Risk Regulations (2009)

The Flood Risk Regulations 2009 transpose the Floods Directive (2007/60/EC) into law in England and Wales.

The regulations required the Lead Local Flood Authority (LLFA), to produce:

- A Preliminary Flood Risk Assessment (PFRA) by December 2011;
- Flood hazard and flood risk maps by December 2013; and
- A Local Flood Risk Management Strategy by December 2015.

A.2.4 The Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 (FWMA), which received Royal Assent on 8 April 2010, takes forward some of the proposals in three previous documents published by the UK Government:

- Future Water;
- Making Space for Water; and

- The Government's Response to the Sir Michael Pitt's Review of the summer 2007 Floods.

The FWMA gives the EA a strategic overview of the management of flood and coastal erosion risk in England. In accordance with the Government's Response to the Pitt Review, it also gives upper tier local authorities in England responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

A.2.5 Land Drainage Acts (1991, 1994)

The water quality and flood risk management of controlled waters including rivers and aquifers is protected by legislation under the Land Drainage Acts (1991, 1994).

A.2.6 National Planning Policy Framework (2019)

The NPPF includes policies on flood risk and minimising the impact of flooding under Section 14, Meeting the challenge of climate change, flooding and coastal change (Paragraphs 155 – 165). The NPPF supersedes the Planning Policy Statement 25 (PPS25).

The NPPF states that:

Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and develop policies to manage flood risk from all sources, taking account of advice from the EA and other relevant flood risk management bodies, such as LLFAs and internal drainage boards.

Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change.

When determining planning applications, Local Planning Authorities (LPAs) should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:

- *within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and*
- *development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of Sustainable Urban Drainage Systems (SuDS).*

A.2.7 National Planning Policy Framework (2023)

The NPPF includes policies on flood risk and minimising the impact of flooding under Section 10, Meeting the challenge of climate change, flooding and coastal change (Paragraphs 152 – 173). The NPPF states that:

Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.

All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property.

When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*

- b) *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;*
- c) *it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- d) *any residual risk can be safely managed; and*
- e) *safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

A.2.8 National Planning Policy Framework (2026)

The NPPF (2026) has been updated to include Chapter 18 ‘Managing flood risk and coastal change’, a chapter dedicated to flood risk and drainage considerations. This includes the following nine policies:

Plan-making policies

- *F1: Assessing flood risk for plan-making*
- *F2: Planning for effective flood risk management*
- *F3: Managing coastal change*

National decision-making policies

- *F4: Assessing flood risk for decision-making*
- *F5: The sequential test*
- *F6: Development in areas at risk of flooding from rivers or the sea*
- *F7: Ensuring development is safe for flooding*
- *F8: Sustainable drainage systems and watercourses*
- *F9: Development in Coastal Change Management Areas*

A.2.9 Sewerage Section Guidance Appendix C – Design and Construction Guidance (2022)

[Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")]

Adopted drainage networks need to meet the criteria outlined in the Design and Construction Guidance (2020). A piped drainage system is required to not surcharge for a 1 in 1-, 1 in 2-, or 1 in 5-year event depending on site conditions or flood the ground in a 1 in 30-year event using a design storm with the critical duration relevant to the site (i.e. the worst-case for a given return period). Private drainage systems also tend to use these criteria as a basis for design. Adoption of new sewers or abandonment of old sewers should take place in accordance with the Water Industry Act 1991, Sections 104 and 116 respectively.

A.2.10 DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)

The DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems provides guidance on:

- Flood risk outside the development;
- Peak Flow Control;
- Volume Control;
- Flood Risk within the development;
- Structural Integrity;

- Designing for Maintenance Considerations
- Construction

Key extracts from this document are provided below:

Peak flow control

S2 For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100-year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Volume control

S4 Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 10- year, 6-hour rainfall event should never exceed the greenfield runoff volume for the same event.

S6 Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

Flood risk within the development

S7 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30-year rainfall event.

S8 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100-year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

S9 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100-year rainfall event are managed in exceedance routes that minimise the risks to people and property.

The standards are supported by Practice Guidance prepared by the Local Authority SuDS Officer Organisation (LASOO).

Appendix B – Greenfield runoff rate calculations

Appendix C - MicroDrainage modelling