whitby wood

Hayes Park West

Flood Risk Assessment

Client: Shall Do Hayes Developments Ltd

Date: October 2025

P451907-WW-XX-XX-RP-C-0001

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REVISION RECORD

Rev	Date	Description	Prepared	Reviewed	Approved
01	01/09/2025	First Issue	TC	RS	RW
02	21/10/2025	Updated Issue	TC	RS	RW

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1 INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared in accordance with National Planning Policy Framework (NPPF) to support the development at Hayes Park West, hereby referred to as 'The Site'. This assessment has been undertaken to ascertain the constraints in order to redevelop the Site, and to assess the impact of the proposals, with respect to flood risk.

1.1 Sources of Information

A review of the relevant information from a range of sources has been undertaken and includes the following:

- Hillingdon Borough Council, Local Plan part one (2012) and two (2020);
- West London, Strategic Flood Risk Assessment (2017);
- West London, Strategic Flood Risk Assessment Online Flood Mapping [Accessed August 2025];
- British National Geology Viewer [Accessed August 2025];
- Greater London Authority, The London Plan (2021);
- National Planning Policy Framework (2025);

1.2 Environment Agency Data

The following information has been gathered from DEFRA's Spatial Data Catalogue of data.gov.uk [accessed July 2025].

- Defended and Undefended Rivers and Seas Extent;
- Risk of Flooding from Surface Water Extent;
- Risk of Flooding from Rivers and Seas Extent;
- Statutory Main River Map;

2 THE SITE

2.1 Site Location

The Site is located at Hayes Park West, Hayes Park, Uxbridge, UB4 8FE in the London Borough of Hillingdon. The Site is centred on a National Grid Reference Number of 508815E, 182574N. A Site Location Plan is shown in Figure 1, which can also be found in **Appendix A**.

FIGURE 1 – SITE LOCATION MAP

2.2 Watercourses

The nearest main watercourse is the Yeading Brook which over 1000m away to the East. Discharge into Yeading Brook would be deemed unviable as this would involve bypassing third party land.

2.3 Geology

The bedrock geology of the Site is London Clay which consists of clay and silt. The Site belongs to soilscape 18 – slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. As shown below in Figure 2, which can also be found in **Appendix B**.

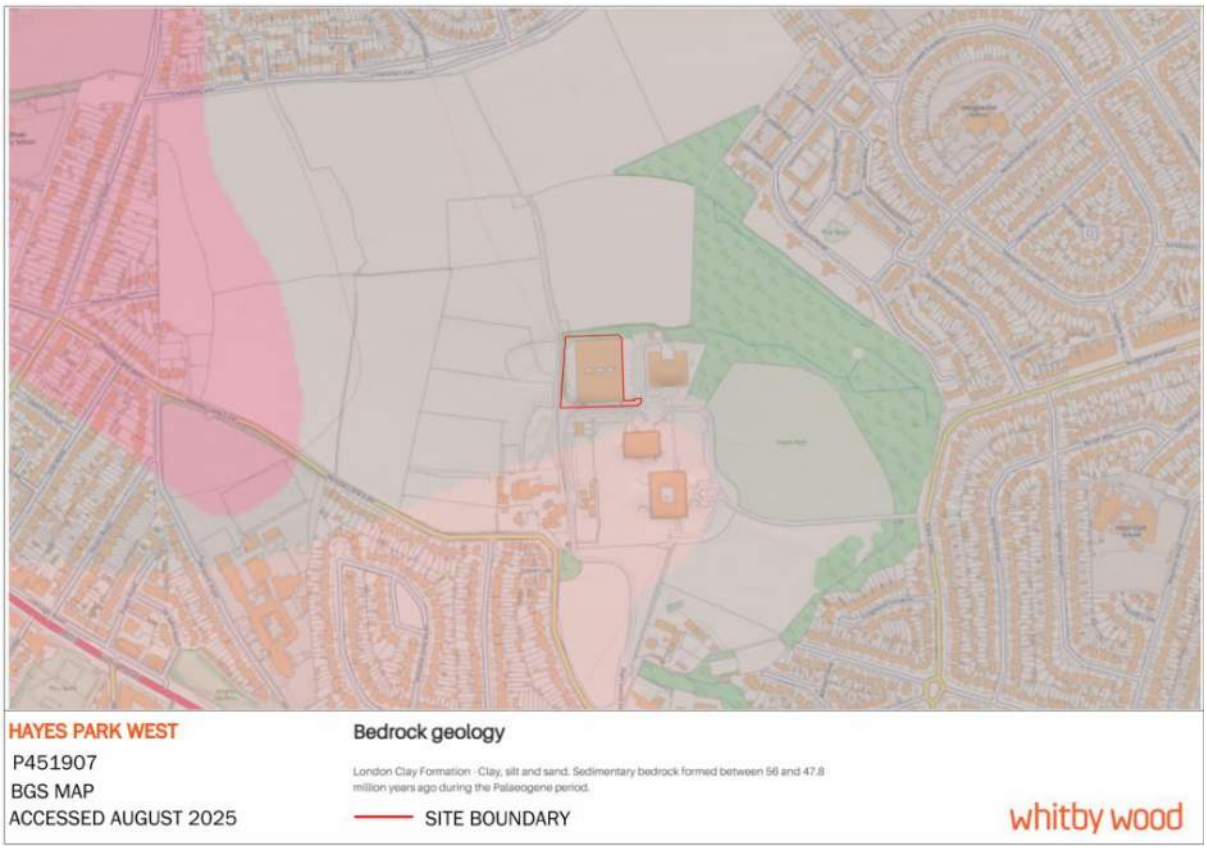


FIGURE 2 – BGS MAP

2.4 Proposed Development

Partial demolition and redevelopment of the existing multi storey car park to provide new homes (Use Class C3), landscaping, car and cycle parking, and other associated works.

In summary, this application is seeking to deliver the following:

The partial demolition of the existing multistorey car park and construction of new 4 storey residential development. 52 new homes (Class C3) comprising a mix of 1-bedroom and 3-bedroom homes. A high proportion of open space and amenity space across the site totalling 3599 sqm, including the provision private gardens, terraces and balconies, new play spaces, internal ancillary facilities, and extensive communal areas surrounding the building. This includes:

- 46 sqm internal communal amenity
- 1733 sqm external communal amenity
- 1655 sqm private external amenity
- 161 sqm play space (doorstep play for children aged 0-4 years)

The proposed development will seek to promote sustainable modes of transport and will provide the following:

- 107 cycle parking spaces allocated as follows:
    - 97 cycle parking spaces allocated to the new homes.

- 10 cycle parking spaces allocated to visitors to the site.
- 52 vehicle parking spaces allocated as follows:
- 52 (49 standard and 3 accessible) vehicle parking spaces allocated to the new homes.

3 FLOOD RISK

3.1 Fluvial and Tidal

The Environment Agency's Flood Risk Data shows the Site is partially situated in Flood Zone 1 as shown in Figure 2 and **Appendix C**. The definition of each flood zone can be found below.

- Land in **Flood Zone 1** has a 0.1% or less annual probability of river or sea flooding
- Land in **Flood Zone 2** has between 0.1% and 1% annual probability of river flooding and between 0.1% and 0.5% annual probability of sea flooding
- Land in **Flood Zone 3** has a 1% or greater annual probability of river flooding and a 0.5% annual probability of sea flooding

FIGURE 3 – FLOOD ZONE MAP

3.2 Surface Water

The risk of surface water flooding has been assessed by viewing the Risk of Flooding from Surface Water and Risk of Flooding from Rivers and Seas maps. The risk appears to be predominantly medium to high for surface water, with a very low risk of flooding from rivers and seas. Flood depths for the surface water flooding in the present day do not exceed 0.9m. When climate change is factored in, there are small areas of the Site which exceed 0.9m in flooding depth. On review of the surface water flooding depth and extents it appears as though there is an anomaly as the flooding matches the extents of the car park exactly which is currently abandoned. The flooding is not consistent with the topographical map, we can therefore downgrade the risk of flooding from surface water to medium. As seen in the extents map shown in Figure

4, with climate change factored in the flooding that occurs across the Site. Most of the Site is affected by surface water flooding, therefore surface water flood risk is deemed high in the areas where development is proposed. The definitions for each surface water flood risk category have been detailed below:

- **Very low** risk means that each year this area has a chance of flooding of less than 0.1%
- **Low** risk means that each year this area has a chance of flooding of between 0.1% and 1%
- **Medium** risk means that each year this area has a chance of flooding of between 1% and 3.3%
- **High** risk means that each year this area has a chance of flooding of greater than 3.3%

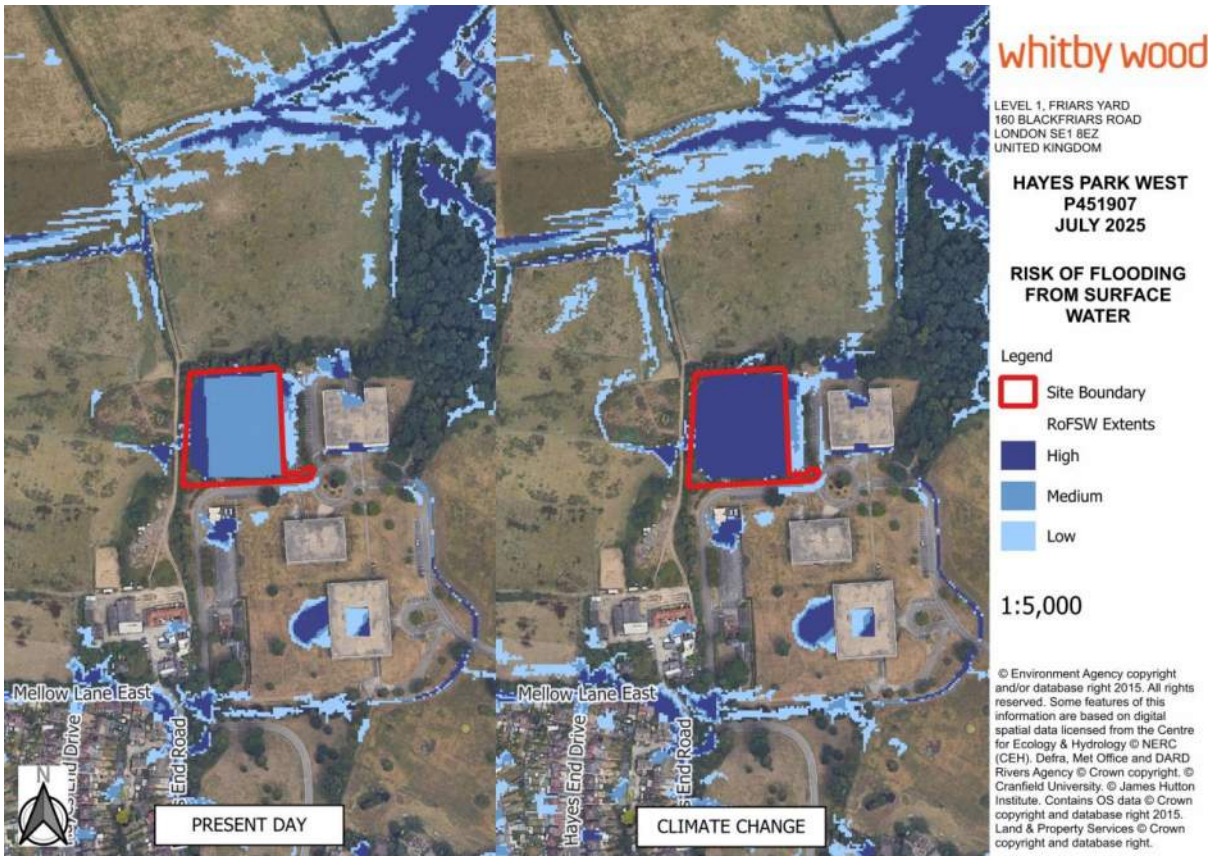


FIGURE 4 – RISK OF FLOODING FROM SURFACE WATER EXTENTS

FIGURE 5 – SURFACE WATER FLOODING PRESENT DAY DEPTHS

FIGURE 6 – SURFACE WATER FLOODING CLIMATE CHANGE DEPTHS

3.3 Groundwater

The West London Strategic Flood Risk Assessment (SFRA) includes a broad scale assessment of the susceptibility of groundwater flooding and increased potential for elevated groundwater across the borough. Figure 7 is taken from the SFRA online data maps and illustrates that the site is within an area that has potential for groundwater flooding of property located below ground level to occur, but the chance of this occurring is still low.

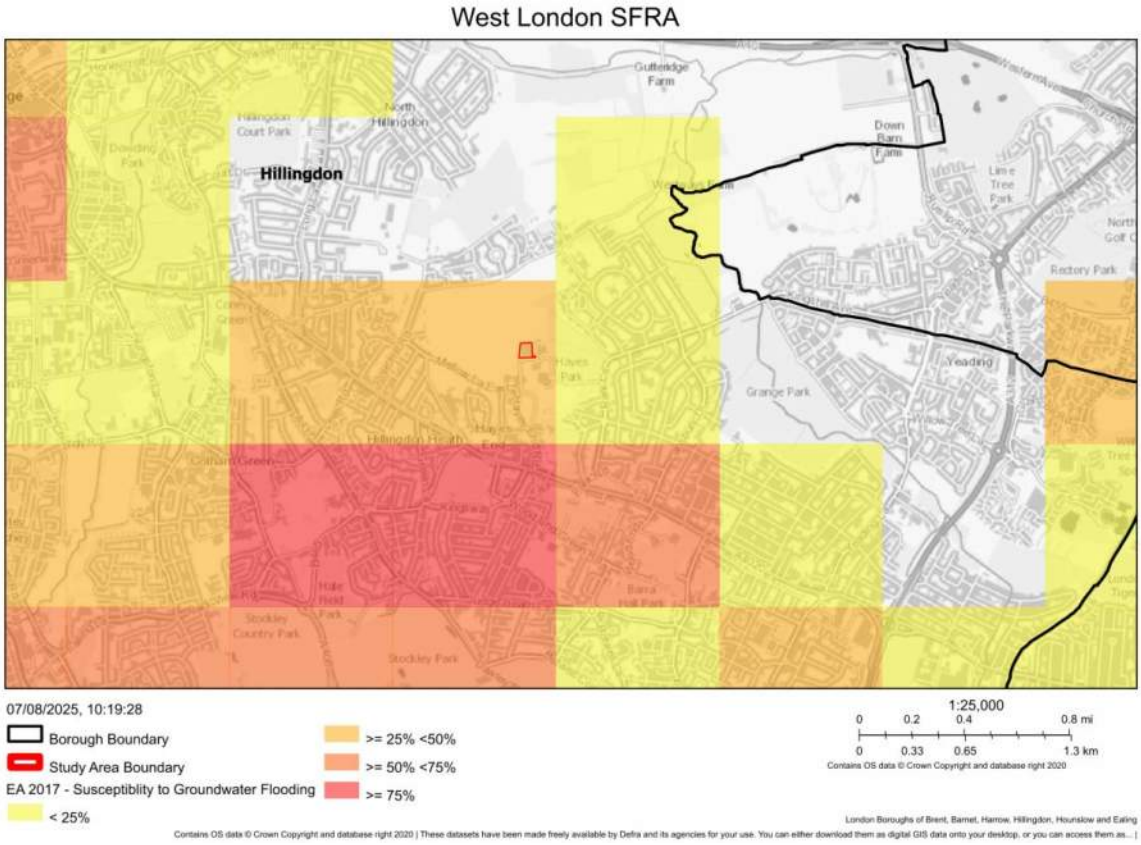


FIGURE 7 – SUSCEPTIBILITY TO GROUNDWATER FLOODING

3.4 Sewer Flooding

As of 2017, according to the West London SFRA there have been no known instances of property flooding within the area, within the last decade, relating to external Thames Water sewers surcharging.

3.5 Artificial Sources

Figure 8 indicates that there is no risk of reservoir flooding to the site or its surrounding area. This is therefore not considered further within the report.

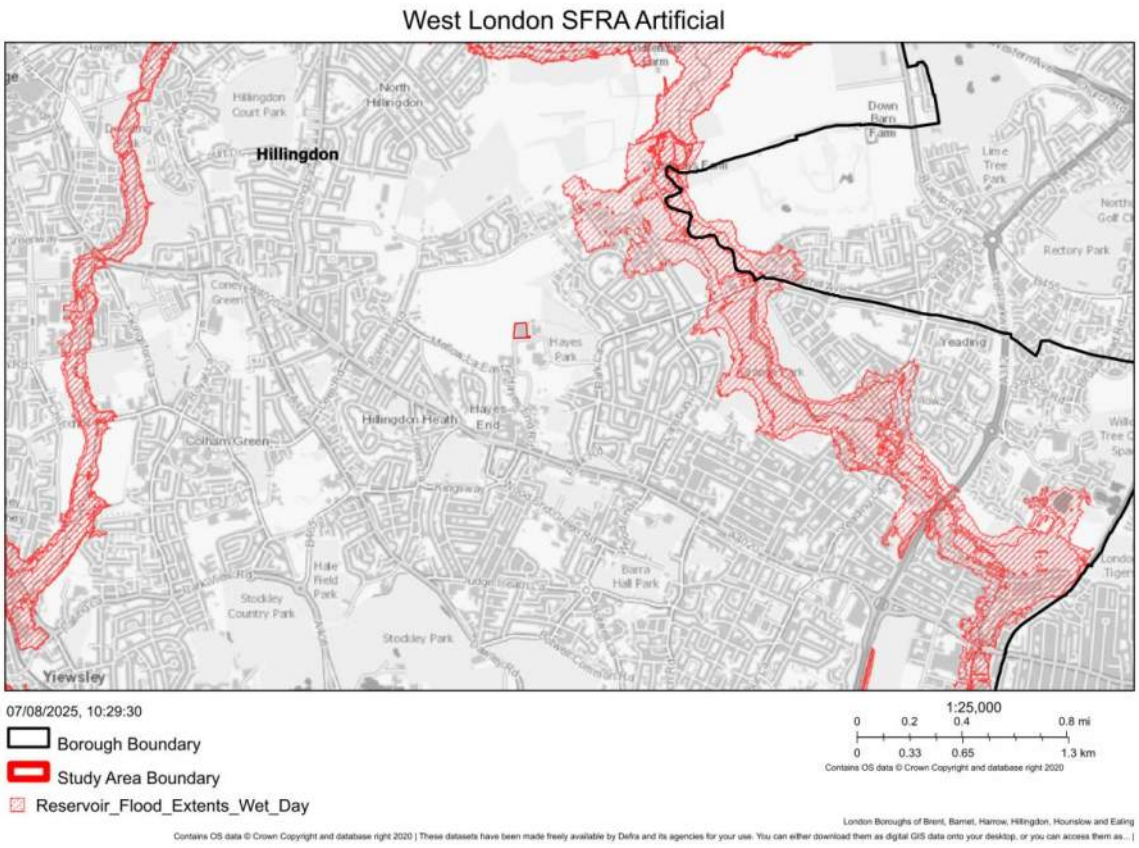


FIGURE 8 – RESERVOIR FLOOD EXTENTS

3.6 Summary

The table below provides a summary of the 5 sources of flood risk considered for this development. The site is deemed to have an overall flood risk of low for the Fluvial flood type. Risk of flooding from pluvial sources is deemed to be medium due to local topography and will be mitigated through the proposed drainage design.

TABLE 1 – FLOOD RISK SUMMARY

Flood Type	Risk		
	Low	Medium	High
Fluvial & Tidal	✓		
Pluvial		✓	
Groundwater	✓		
Sewer	✓		
Artificial	✓		

4 PLANNING POLICY AND GUIDANCE

4.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) provides the planning framework on which this FRA has been based. The NPPF states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary, the development should be made safe and not increase flood risk elsewhere.

4.2 Sequential Test

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be permitted if there are reasonably available sites appropriate for development in areas at a lower risk of flooding.

A sequential test is required for major and non-major development (refer to check the development class) if any proposed building, access and escape route, land-raising or other vulnerable element will be:

- in Flood Zone 2 or 3 - see flood map for planning
- in Flood Zone 3b and your development is not incompatible
- within 'Flood Zones plus climate change', showing it is at increased risk of flooding from rivers or sea in future – see the flood map for planning
- within Flood Zone 1 and the flood map for planning shows it is at risk of flooding from surface water
- in Flood Zone 1 and the LPA's SFRA shows it will be at increased risk of flooding during its lifetime subject to sources of flooding other than rivers or sea
- A development is not exempt from the sequential test just because a FRA shows it can be made safe throughout its lifetime without increasing risk elsewhere

Development is exempt from the sequential test if it is a:

- householder development like residential extensions, conservatories or loft conversions
- small non-domestic extensions with a footprint of less than 250 square metres
- change of use - except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site

Development is also exempt from the sequential test if it is a development on a site allocated in the development plan through the sequential test and:

- the proposal is consistent with site's allocated use
- there have been no significant changes to the known level of flood risk to the site, now or in the future, which would have affected the outcome of the test

You may not need a sequential test if development can be laid out so that only elements such as public open space, biodiversity and amenity areas are in areas at risk of any source of current or future flooding.

As the development is at risk of flooding from surface water, the Sequential Test is required.

4.2.1 Flood Vulnerability Classification

Any proposed development on the Site will be subject to the planning requirements of Westminster City Council, the Lead Local Flood Authority (LLFA) and the National Planning Policy Framework (NPPF).

Flood risk vulnerability classification for all flood zones had been reproduced in Table 3. This has been extracted from the NPPF Planning Practice Guidance. Building types are classified depending on their use and are placed in a higher vulnerability class depending on flood risk sensitivity. Examples of typical building uses for each vulnerability classification have also been included in Table 4.

The NPPF guidance states that 'buildings used for dwellings' and 'educational establishments' fall under the category of 'more vulnerable' and therefore the Exception Test is required for this Scheme.

TABLE 2 – FLOOD RISK VULNERABILITY AND FLOOD ZONE COMPATABILITY

Flood Zones	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	X	Exception Test required	✓	✓
Zone 3b	Exception test required	X	X	X	✓

TABLE 3 – FLOOD RISK VULNERABILITY CLASSIFICATION

Vulnerability Classification	Building Use Example
Essential infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which must be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.

Highly vulnerable	• Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.
More vulnerable	• Hospitals. • Residential institutions such as residential care homes, children's homes, social • services homes, prisons and hostels. • Buildings used for dwelling houses, 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, restaurants and cafes, offices, general industry, storage and distribution, non–residential institutions not included in "more vulnerable", and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). • Car parks.
Water compatible	• Flood control infrastructure. • Water and sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation 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 • 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.

4.2.2 Exception Test

The exception test is needed for development with a vulnerability classification of:

- 'highly vulnerable' in Flood Zone 2
- 'more vulnerable' in Flood Zone 3a
- 'essential infrastructure' in Flood Zone 3a or 3b

If the sequential test is satisfied, you need to satisfy both elements of the exception test before the LPA can permit the development.

The exception test is not required for the Site.

4.3 Climate Change

In May 2022, climate change allowances were published by the Environment Agency. These allowances are based upon predicted changes in fluvial flows and rainfall intensities due to climate change.

4.3.1 Peak Fluvial Flows

The table below has been extracted from the DEFRA's climate changes allowances map showing peak river flow allowances for the Thames Management Catchment. As the Site is in Flood Zone 1 and the proposals are for 'more vulnerable' building uses, the central allowance would be appropriate.

TABLE 4 – PEAK RIVER FLOW ALLOWANCES FOR LONDON MANAGEMENT CATCHMENT

Allowance category	Central	Higher	Upper
Total potential change anticipated for '2020s'	10%	14%	26%
Total potential change anticipated for '2050s'	7%	14%	30%
Total potential change anticipated for '2080s'	17%	27%	54%

4.3.2 Peak Rainfall Intensity

The peak rainfall intensity is expected to increase as a result of climate change. Table 6 has been extracted from DEFRA's climate change allowances and assesses different scenarios of 1% and 3.3% annual exceedance rainfall events. Both the upper and central allowances of the associated epoch should be reviewed for a proposed development.

TABLE 5 – PEAK RAINFALL INTENSITY ALLOWANCES FOR LONDON MANAGEMENT CATCHMENT

Allowance category	Total potential change anticipated for the '2050s'		Total potential change anticipated for the '2070s'	
	3.3% rainfall event	1% rainfall event	3.3% rainfall event	1% rainfall event
Central	20%	20%	20%	25%
Upper	35%	40%	35%	40%

4.4 London Plan

The London Plan is a framework which should be used for all developments within London. Policy SI 12 of the London Plan 2021 is specific to flood risk management and all development proposals should adhere to; the policy has been reproduced below.

A. 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.
B. 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. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.
C. Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.
D. Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.
E. Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.
F. Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.
G. Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat.

4.5 Local Plan

Hillingdon's Local Plan is a framework which should be used for all developments within the borough. Within the this documents are Polices that outlines the strategic principles, spatial strategy and technical criteria to follow and implement when considering flood risk management:

4.5.1 Local Plan part one (2012)

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.

4.5.2 Local Plan part two (2020)

Management of Flood Risk:

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 London Borough of Hillingdon Local Plan Part 2 - Development Management Policies 80 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.

Water Management, Efficiency, and Quality:

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.
G. All new development proposals (including refurbishments and conversions) will be required to include water efficiency measures, including the collection and reuse of rainwater and grey water.
H. All new residential development should demonstrate water usage London Borough of Hillingdon Local Plan Part 2 - Development Management Policies 83 rates of no more than 105 litres/person/day. I) It is expected that major development8 proposals will provide an integrated approach to surface water run-off attenuation, water collection, recycling and reuse.
I. All new development proposals will be required to demonstrate that there is sufficient capacity in the water and wastewater infrastructure network to support the proposed development. Where there is a capacity constraint the local planning authority will require the developer to provide a detailed water and/or drainage strategy to inform what infrastructure is required, where, when and how it will be delivered.

4.6 Strategic Flood Risk Assessment

1. Boroughs should adopt a sequential approach for planning and development to identify areas that are not susceptible to flood risk impacts posed by climate change. Development should be encouraged in these identified areas to make properties more resilient to increasing flood risk and reduce the reliance on property level protection methods.

2. Boroughs should apply the Sequential Test to Allocated Sites within the LPA area at an early stage in the Local Plan development process to help identify any lower flood risk areas that may not be suitable for development. This can be used to inform spatial planning and identify key growth locations, increasing the possibility of facilitating development which is not exposed to flood risk whilst meeting development objectives.

3. Boroughs should implement measures through their Local Plans to deal with the Sequential Test acceptability of windfall site development proposals at the strategic level. The measure could set out locations and quantities of windfall sites that would or would not be acceptable in Sequential Test terms (to provide input to the process defined in *Section 4.2.1*). This would help create efficiencies in the process.

4. If it is determined by evidence that there are insufficient sites within Flood Zone 1 to meet the borough's housing development targets, then windfall developments in Flood Zone 2 or 3 might be acceptable and should be considered (preferably with support of a Level 2 SFRA). This would inform an approach determining locations where the Sequential Test would be passed. Conversely, if the borough has sufficient land available in Flood Zone 1 to accommodate windfall development sites,

then it may not be possible or prudent to consider windfall development in Flood Zone 2 or 3 as acceptable.

5. Existing and planned flood alleviation schemes should be incorporated into Borough Infrastructure Delivery Plans (IDPs). Where these IDPs, or similar corporate work programmes (e.g. planned highway improvement works or Green Infrastructure Plans), identify predicted or actual flood risks, new potential strategic level flood alleviation schemes should be developed.
6. Boroughs should make space for water storage by identifying strategic locations that are required for current and future flood risk management. These identified areas of land should be safeguarded via Local Plans to facilitate links between flood risk management and other environmental priorities.
7. Boroughs should adopt a Catchment Based Approach to ensure recognition of catchment wide flood issues to justify the collection and use of S106 funding to investigate and develop flood alleviation schemes within the catchment the development falls within. CDAs defined by the Borough SWMPs (for surface water flooding) or policy sub-areas defined by EA CFMPs (for fluvial / tidal flooding) provide an established technical basis for this approach.
8. Boroughs should set up mechanisms to enable the use of CIL charges to be used for flood alleviation schemes across the borough to address the cumulative impact of development on flood risk.
9. Boroughs should use their Local Plans to ensure developments within CDAs (as defined by SWMPs) provide increased surface water drainage requirements. Examples could include increased storage through the use of SuDS to restrict off-site runoff rates to greenfield (or lower) conditions.
10. Boroughs should develop standing advice for the assessment of minor development planning applications with surface water implications. This will aid LPAs in making informed and consistent decisions where the EA and / or LLFA has no statutory duty to provide comments as part of an application's review exercise.
11. Boroughs should review the benefits of removing Permitted Development rights for sites which fall within Flood Zones 3a and / or 3b, collaborating on Article 4 Directions where justifiable, defendable and beneficial. This could include provisions around sub-divisions, extensions and paving of gardens in specific areas.
12. Boroughs should use their Local Plans to ensure developments with a high susceptibility to groundwater flooding (as identified in the Sewer, Groundwater & Artificial Flood Risk Interactive Web Map and other available data) demonstrate that increased groundwater mitigation and management measures have been implemented to protect people from groundwater flooding. Any known groundwater and flow routes should be safeguarded to ensure ground water flood risk is not increased on site or elsewhere.
13. Boroughs should consider implementation of further surface water flood risk mitigation requirements for proposed developments within Flood Zone 3a (surface water) where the development is also within the 1 in 30yr RoFSW mapped extents. These requirements could be similar to those adopted for Flood Zone 3b (fluvial / tidal) Functional Floodplain with modifications as follows:

A. Development within the 1 in 30yr RoFSW mapped extent will be treated as if it were Flood Zone 3b (Functional Floodplain) as defined in PPG Table 1 (Paragraph 065).

B. Development may be possible within the 1 in 30yr RoFSW mapped extents outside of existing infrastructure or solid building footprints.

C. To enable development, the proposals must provide mitigation and resilience against flood risks (taking advice from the LLFA as appropriate) and provide appropriate compensation on existing flood risk levels (addressing the predicted 1 in 30yr and 1 in 100yr RoFSW mapped depths as a minimum), supported by detailed flood risk modelling if appropriate.

D. The development must not increase flood risk elsewhere and where possible reduce flood risk overall.

E. Where beneficial to flood risk and/or other planning requirements, it may also be possible for development to occur within the functional floodplain through the relocation (but not increase of footprint size) of an existing building's footprint within a site.

5 MANAGING FLOOD RISK

5.1 Master Planning

It is recommended that the Proposed Development is continued to be designed with flood risk and drainage implications in mind. Proposed ground levels will need to consider potential exceedance flow pathways from onsite drainage. Any displaced surface water flooding should be mitigated against to avoid increasing flood risk elsewhere. An Exceedance Flow Path has been produced in **Appendix E**.

5.2 Mitigating Measures

As there are areas of 'high' risk of pluvial flood risk, additional measures such as channel and threshold drains will be implemented in the proposed drainage strategy to ensure that these inundations are managed. Other drainage components like gullies and more detailed designed channel drains will be coordinated at a later stage.

The Exceedance Flow Path demonstrates that water flow paths will be flowing into landscaped areas and localised depressions to reduce the risk of adverse flooding onto external properties and mange this within the proposed developments boundary.

6 SURFACE WATER MANAGEMENT

6.1 Greenfield Runoff Rates and Volumes

Greenfield runoff rates have been calculated using FEH 22 catchment data method and a 6-hour rainfall event, these can be found in **Appendix F**. For this proposed development, it can be stated that only the building footprint and immediate catchment (0.9 ha) will be used when calculating the existing and proposed discharge rates. The table below shows the greenfield runoff rates for the development and factored to provide a runoff rate per hectare. The table also illustrates the current discharge rates based on existing site conditions. A time concentration of 5 minutes was assumed and a runoff coefficient of 1 has been used.

$$Q = 2.78\ C_V\ C_r\ i\ A_i \quad (1)$$

Where;

C_V is the volumetric runoff coefficient;

C_r is the dimensionless routing coefficient, with a value of 1.3 used;

i is the rainfall intensity; and

A_i is the impermeable area.

TABLE 6 – GREENFIELD RUNOFF AND EXISTING DISCHARGE RATES

Return Period	Greenfield runoff rates		Existing Discharge Rates (l/s)
	Whole Site [0.9 ha] (l/s)	Per hectare (l/s/ha)	
QBAR	4.4	4.9	-
1-year	3.7	4.1	179.9
30-year	10.5	11.7	425.3
100-year	13.9	15.4	539.1

6.2 Proposed Discharge Rates

It is proposed that surface water runoff from the site is 4.4 l/s (QBar), a vortex flow control device will restrict the outflow for the corresponding storm event, up to a maximum rate 1 in 100 year storm event (including an allowance of 40% for climate change). Further details will be provided within the proposed drainage strategy.

6.3 Delivering a SuDS Scheme

The philosophy of SuDS is about maximising the benefits and minimising the negative impacts of surface water runoff from developed areas. The 'four pillars' of SuDS design as described by the SuDS Manual are;

- Water Quantity;
- Water Quality;
- Amenity; and
- Biodiversity.

The philosophy of SuDS is about maximising the benefits and minimising the negative impacts of surface water runoff from developed areas throughout its life cycle. This is known as the treatment train philosophy and uses drainage techniques to systematically control the three elements of runoff; pollution, flow rates and volumes.

SuDS can improve the quality of life in developments by making them more vibrant, visually attractive, sustainable and more resilient to change, by improving urban air quality, regulating building temperatures, reducing noise and delivering recreation and education opportunities.

The SuDS design should therefore as much as possible, be based around the following;

- Using surface water runoff as a resource;
- Managing rainwater close to where it falls;
- Managing runoff on the surface;
- Allowing rainfall to soak into the ground;
- Promoting evapotranspiration;
- Slowing and storing runoff to mimic natural runoff characteristics;
- Reducing contamination of runoff through pollution prevention and controlling the runoff at source; and
- Treating runoff to reduce the risk of urban contaminants causing environmental pollution.

Any proposed development on the Site has the potential to maximise SuDS and conform to SuDS best practice. Ultimately a well designed and constructed SuDS scheme will provide a robust and reliable surface water drainage network, whilst providing increased amenity and biodiversity.

6.4 Drainage Hierarchy

As stated in the National Planning Practice Guidance, the aim should be to discharge surface water run-off as high up the drainage hierarchy, as reasonably practicable. Local Authorities and Water Boards often require proof that each option is not feasible before considering the next.

The drainage hierarchy is as follows:

1. Discharge into the ground (infiltration);
2. Discharge to a surface water body;
3. Discharge to a surface water sewer, highway drain, or another drainage system;
4. Discharge to a combined sewer.

For this Site, infiltration is not deemed feasible due the presence of Clay. Discharging into a watercourse will be unviable as this would incorporate bypassing third party land. The proposed strategy will be to discharge surface water into the Thames Water surface water sewage network surrounding the Site.

7 CONCLUSIONS AND RECOMMENDATIONS

From the conclusion of this report, it can be stated that the scheme complies with NPPF and the Westminster City Council's criteria in the City Plan. The proposals will not increase the risk of flooding elsewhere and has managed the safety of building occupants within the Site boundary.

The main conclusions from this flood risk assessment are detailed below.

- The Site is entirely located in Flood Zone 1 with some patches of low, medium and high risk pluvial flooding, predominantly within low laying areas of the site.
- The West London SFRA illustrates that the site is within an area that has potential for groundwater flooding of property located below ground level to occur.
- There is generally considered to be a low risk of flooding from all other sources.
- The predicted presence of clay and high groundwater means infiltration on site is not recommended at this stage.
- Flood protection measures will be implemented within the proposed drainage strategy to protect against pluvial flooding.
- There is existing drainage within proximity to the site. A pre-planning enquiry with Thames Water has been submitted to ensure for capacity within the network at the time of writing, however a response has not yet been received.
- Ultimately surface water will discharge into the nearest Thames Water surface water public sewer, with foul water to the nearest available foul water sewer, where feasible.
- Currently the surface water is proposed to discharge at 4.4 l/s, with foul water unrestricted. Overall, a betterment of over 99% will be achieved.
- The proposed development provides the opportunity to utilise SuDS. Not all SuDS techniques will be suitable for this site but through assessing the benefits and constraints the most appropriate SuDS techniques should be selected.

Appendix A – Site Map

whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
HILLINGDON, LONDON
P451907
JULY 2025

SITE LOCATION PLAN

Legend

Site Boundary

1:7,500

Appendix B – BGS Map

HAYES PARK WEST

P451907

BGS MAP

ACCESSED AUGUST 2025

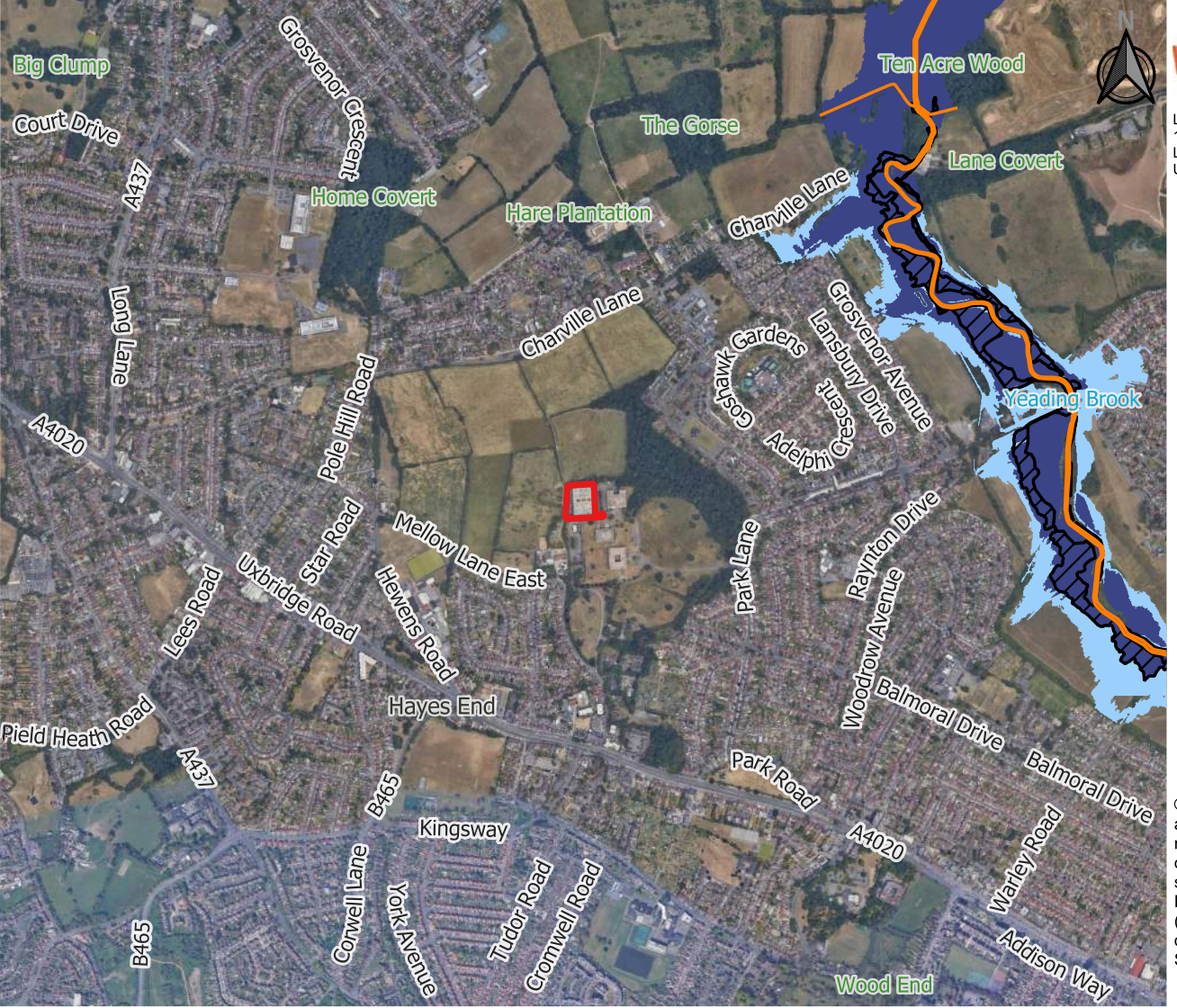
Bedrock geology

London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.

SITE BOUNDARY

whitby wood

Appendix C – Flood Maps



whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
P451907
JULY 2025

FLOOD ZONE MAP

Legend

- Site Boundary
- Flood Defence
- Area Benefitting From Flood Defence
- Flood Zone 2
- Flood Zone 3

1:20,000

whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES WEST PARK
P451907
JULY 2025

RISK OF FLOODING FROM RIVERS AND SEAS

Legend

- Site Boundary
- RoFRS Extents
  - High
  - Medium
  - Low

1:5,000

whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
P451907
JULY 2025

RISK OF FLOODING FROM RIVERS AND SEAS
PRESENT DAY DEPTH OF WATER

Legend

- Site Boundary
- RoFSW
- High
- Medium
- Low

1:2,000

whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
P451907
JULY 2025

RISK OF FLOODING FROM RIVERS AND SEAS
CLIMATE CHANGE
DEPTH OF WATER

Legend

Site Boundary

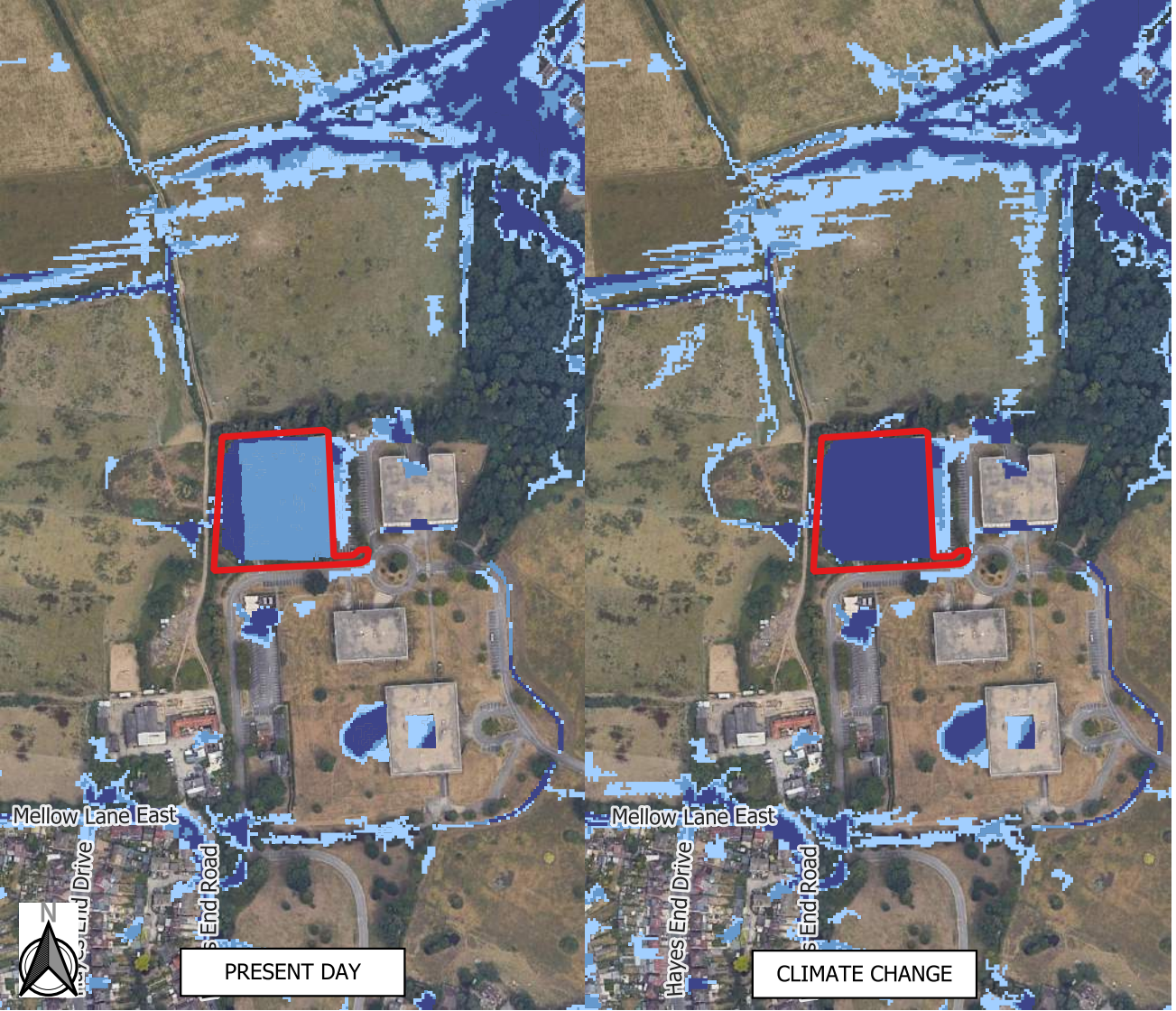
RoFSW Extents

High

Medium

Low

1:2,000



whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
P451907
JULY 2025

RISK OF FLOODING FROM SURFACE WATER

Legend

- Site Boundary
- RoFSW Extents
  - High
  - Medium
  - Low

1:5,000

whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

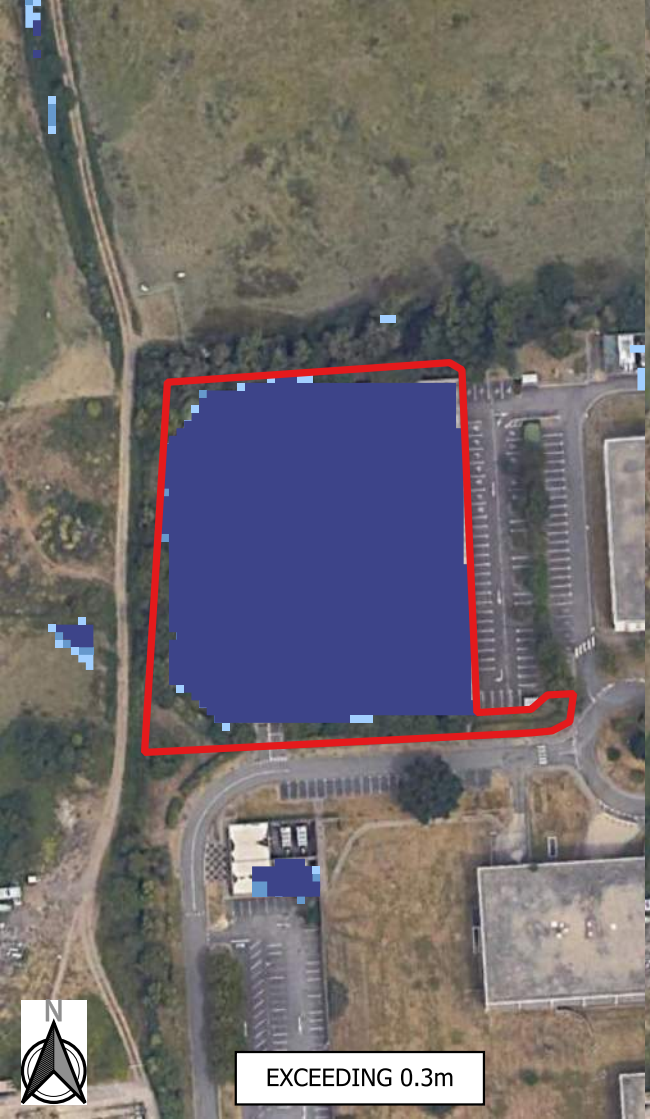
HAYES PARK WEST
P451907
JULY 2025

RISK OF FLOODING FROM SURFACE WATER
PRESENT DAY DEPTH OF WATER

Legend

- Site Boundary
- RoFSW
- High
- Medium
- Low

1:2,000



whitby wood

LEVEL 1, FRIARS YARD
160 BLACKFRIARS ROAD
LONDON SE1 8EZ
UNITED KINGDOM

HAYES PARK WEST
P451907
JULY 2025

RISK OF FLOODING FROM SURFACE WATER
CLIMATE CHANGE
DEPTH OF WATER

Legend

Site Boundary

RoFSW Extents

High

Medium

Low

1:2,000

Appendix D – SFRA Maps

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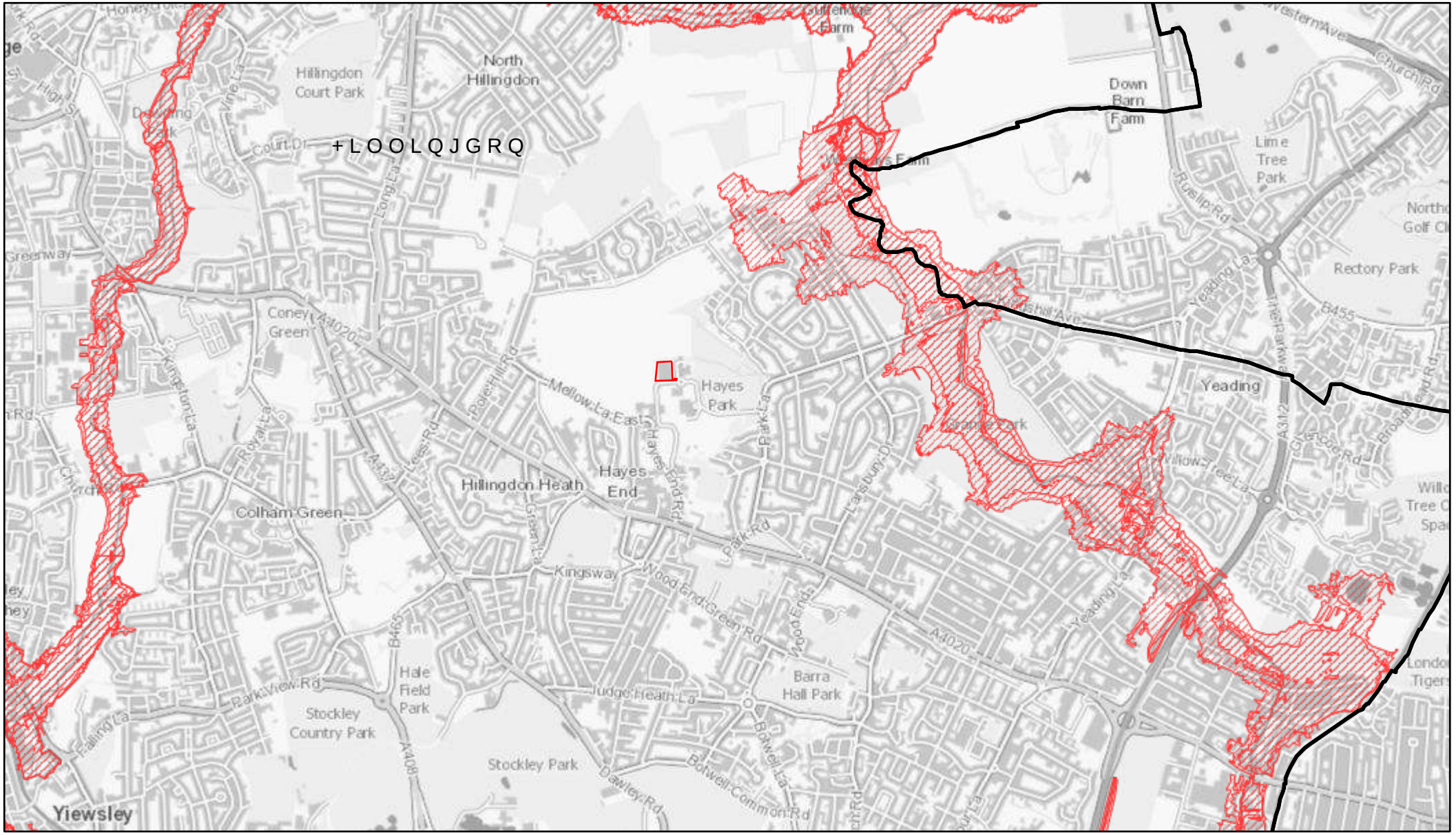

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/RQGRQ %RURXJKV RI %UHQW %DUQHW +DUURZ

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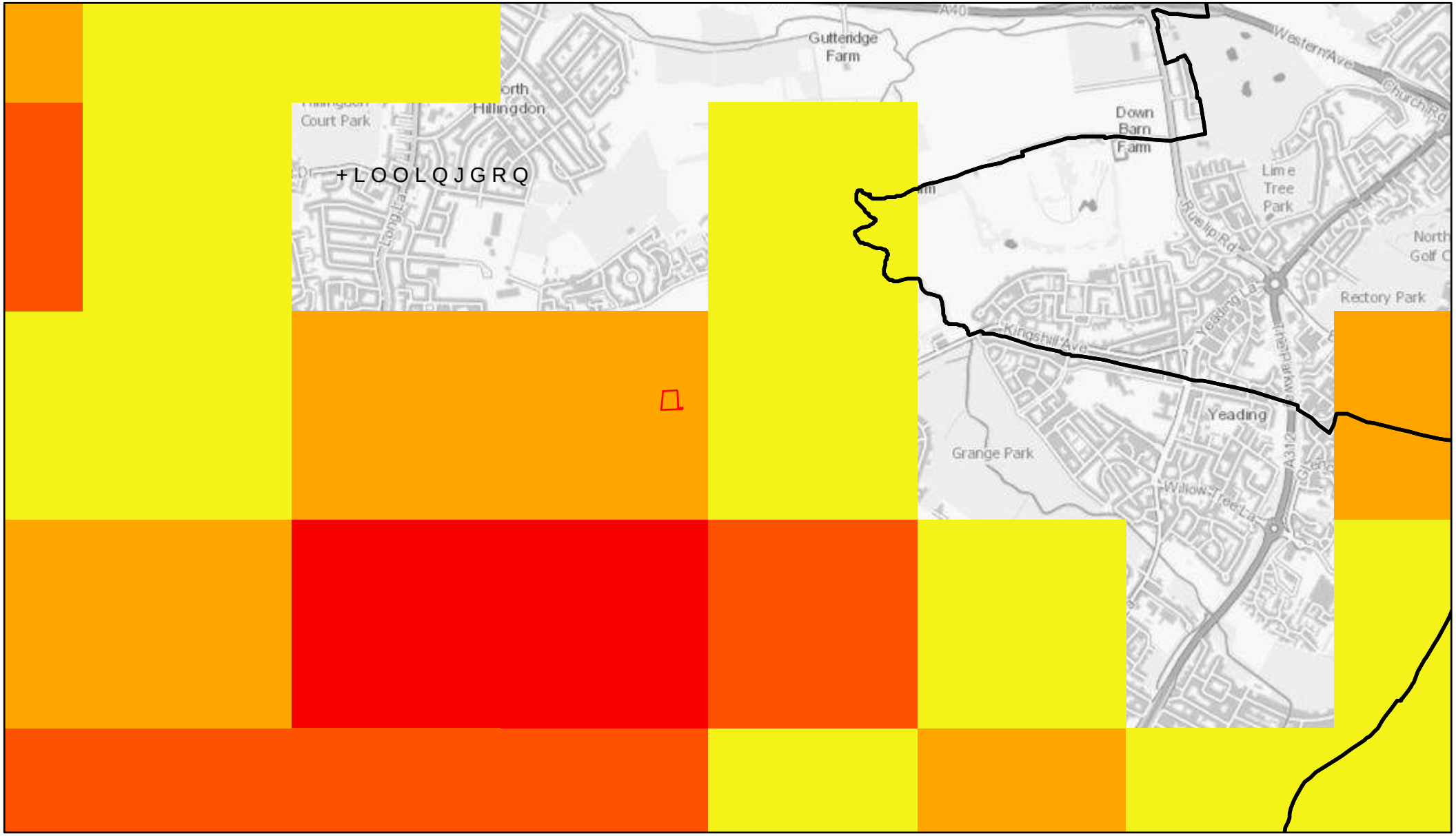
:HVW /RQGRQ 6)5$



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Appendix E – Exceedance Flow Paths

Red Line boundary extent subject to agreement with client and design team. The line matches the north and west extents of the title plan.

Existing woodland undergrowth - should this be left as is? ecologist/ arb to advise

Combination of herbaceous perennial planting, shrubs and ground cover

Proposed native hedgerow

2no. Blue Badge bays

Combination of herbaceous perennial planting, shrubs and ground cover - focussed on edible/ productive species

Manage existing wooded buffer; prune/ cut back canopy; infill native shrubs and ground cover

6no. EVCP Bays

Shrubs/ hedge

Shrubs/ hedge

Proposed Trees - 3 sizes
Small - 3.5m height, canopy area at maturity 10m2
Medium - 6m height, canopy area at maturity 20m2
Large - 8m height, canopy area at maturity 35m2

Combination of herbaceous perennial planting, shrubs and ground cover

Shrubs/ hedge

Hatched area shows extent of vegetated retaining wall system, max 2.5m height, hydroseeded for wildflower coverage. SEW waiting on information from supplier to understand retention system and potential impacts to existing tree RPA.

Light green shows wildflower verge at car park level.

Proposed native hedgerow

Vegetated retaining wall will require removal of existing tree T112 + potential impacts to T118 RPA. Client/ Arboriculture & ecology to advise

Red Line boundary extent subject to agreement with client and design team.

Existing trees and groundcover to landscape bank - no change

HAYES PARK WEST

EXCEEDANCE FLOW PATHS

GENERAL NOTES:
- DO NOTE SCALE FROM THIS SKETCH. THIS SKETCH CAN NOT BE USED FOR CONSTRUCTION.

Key
- SITE BOUNDARY
- FLOW PATH

PRELIMINARY

whitby wood

Project Title:	HAYES PARK WEST			
Project No:	P451907			
Sketch No:	P451907-WW-XX-XX-SK-C-0004			
Title:	EXCEEDANCE FLOW PATHS			
Scale:	Rev:	Date:	Eng:	Checked:
1:200	01	08/08/25	TC	RS

Appendix F – Runoff Rates

GREENFIELD RUNOFF RATE

Pre-development discharge

Site Makeup	Greenfield
Greenfield Method	FEH
Positively Drained Area (ha)	0.900
SAAR (mm)	629
Host	1
BFIHost	0.175
Region	6
QBar/QMed conversion factor	1.136
Betterment (%)	0
	Calc
QMed (l/s)	3.8
QBar (l/s)	4.4

Return Period (years)	Growth Factor	Q (l/s)
1	0.85	3.7
30	2.40	10.5
100	3.19	13.9

BROWNFIELD RUNOFF RATE

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.910
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	0
	Calc

Return Period (years)	Q (l/s)
1	179.9
30	425.3
100	539.1

50% BETTERMENT RUNOFF RATE

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.910
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	50
	Calc

Return Period (years)	Q (l/s)
1	90.0
30	212.6
100	269.5

82% BETTERMENT RUNOFF RATE

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.910
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	82
	Calc

Return Period (years)	Q (l/s)
1	32.4
30	76.6
100	97.0

QBAR STORAGE CALCULATION

Storage Estimate

Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.900
Peak Discharge (l/s)	4.400
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	852
to	1010

GREENFIELD STORAGE CALCULATION

Storage Estimate

Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.900
Peak Discharge (l/s)	13.900
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	664
to	860

100 l/s STORAGE CALCULATION

Storage Estimate

Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.900
Peak Discharge (l/s)	100.000
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	294
to	510

50% BETTERMENT STORAGE CALCULATION

Storage Estimate

Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.900
Peak Discharge (l/s)	269.500
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	160
to	326

BROWNFIELD STORAGE CALCULATION

Storage Estimate

Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.900
Peak Discharge (l/s)	539.100
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	72
to	230

HAYES PARK WEST

PRELIMINARY

ATTENUATION CALCULATIONS

GENERAL NOTES:

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Project Title:	HAYES PARK WEST			
Project No:	P451907			
Sketch No:	P451907-WW-XX-XX-SK-C-1001			
Title:	ATTENUATION CALCULATIONS			
Scale:	Rev:	Date:	Eng:	Checked:
NTS	P2	21/10/25	TC	RW

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