

STRATEGIC FLOOD RISK ASSESSMENT – LEVEL 2



PREPARED FOR THE LONDON BOROUGH OF EALING

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
AEP	Annual Exceedance Probability
Ealing	London Borough of Ealing
EA	Environment Agency
FRA	Flood Risk Assessment
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
OS	Ordnance Survey
PPG	Planning Practice Guidance
RoFSW	Risk of Flooding from Surface Water
SFRA	Strategic Flood Risk Assessment
TWUL	Thames Water Utilities Limited
WMS	Web Map Service

1 INTRODUCTION

Local Planning Authorities (LPAs) are required under the [National Planning Policy Framework \(NPPF\)](#) to develop a Strategic Flood Risk Assessment (SFRA) which should assess the risk to an area from flooding from all sources, now and in the future. It should take into account the impacts of climate change and assess the impacts of land use changes and development on flood risk.

The London Borough of Ealing (Ealing) has commissioned a Level 2 SFRA to support the development of their Local Plan. This provides a detailed assessment from all sources of flood risk for specified sites requiring targeted assessments. The sources of flood risk assessed include fluvial, surface water, sewer, groundwater and artificial (reservoir and canal) sources. A total of 19 site allocations were assessed as part of this Level 2 SFRA, as listed in *Section 2.2* of this report.

The purpose of the assessment is to provide the information necessary for the application of the Sequential Test, which identifies the potential development sites with the lowest risk of flooding and whether development can be made safe without increasing flood risk elsewhere. It enables developers to then provide appropriate flood risk mitigation for their site and outlines how this can be achieved. The Site Assessments similarly provide information to support the application of the Exception Test where required.

The key outputs of the Level 2 SFRA include an updated Screening Assessment for the 85 allocated sites (*Appendix A – Screening Assessment*), which identifies which sites require a full Site Assessment. Site Assessments have been produced for each of the 19 sites that were identified (*Appendix B – Site Assessments*), which provides an assessment of each flood source, with planning considerations and potential mitigation measures that may be required for the assessed site.

1.1 Background

Ealing, together with the West London Boroughs of Barnet, Brent, Harrow, Hounslow, and Hillingdon, completed their joint [Level 1 SFRA](#) in 2018. It was written in line with the NPPF and [Flood Risk and Coastal Change Planning Practice Guidance](#) (PPG) and provides a strategic overview of all forms of flood risk throughout the study area. It provides the evidence base to inform the preparation of Local Plans and to ensure that development is steered away from areas identified as most at risk of flooding from all sources.

The [PPG](#) states that a Level 2 SFRA is required if:

- “you cannot allocate all land for development outside flood risk areas”
- “you can allocate land for development outside flood risk areas, but believe you may get high numbers of applications in flood risk areas on sites not identified in the local plan”

The Screening Assessment identified 14 sites which require assessment due to surface water flood risk, and a further five sites triggered a Site Assessment due to the significance of fluvial flood risk (two of which were also triggered by surface water flood risk). These sites have therefore been analysed in more detail in the Site Assessments.

1.2 Policy

This Level 2 SFRA has been produced in line with national, regional, and local policy. The [Level 1 SFRA](#) was also produced in line with policy which is relevant to the Level 2 SFRA, however there are some policy requirements which specifically relate to Level 2 assessments, and some policy updates which have taken place since the publication of the Level 1 SFRA. These are referenced within *Section 1.2.1*. The policies are put in place to ensure that flood risk is considered when making planning decisions about the design and location of any future development, including flood risk management features and structures. This therefore makes sure that development is steered away from areas at greater risk of flooding to protect both people and property.

The Level 1 SFRA has a section on '[Planning and Policy Framework](#)' which provides an overview of the flood risk policies and requirements on national, regional and sub-regional levels. Local borough-specific policies and requirements are also referenced for each borough with a link to the key documents relating to flood risk.

1.2.1 National Policy

The national policy which guides the requirements of SFRAs includes the [NPPF](#) and accompanying [PPG](#), which contain information on producing both Level 1 and Level 2 SFRAs, for example, when they are required, and what level of detail they should contain. The NPPF and PPG also introduce both the Sequential and Exception Tests. The Sequential Test compares the site which is proposed to be developed with other available sites to steer development towards the areas with the lowest flood risk. The Exception Test is required when the Sequential Test shows that it is not possible to locate development in an area with a lower risk of flooding. This is required for developments which are: Highly Vulnerable and in Flood Zone 2, Essential Infrastructure in Flood Zone 3a or 3b, or More Vulnerable in Flood Zone 3a. This Level 2 SFRA is structured to provide the basis for the application of this Test. [Section 4.2.1 of the Level 1 SFRA](#) provides further guidance on the application of the Sequential and Exception Tests.

Both the NPPF and PPG have undergone revisions since the publication of the Level 1 SFRA. The NPPF was most recently revised in September 2023, and key changes were made in the 2021 revision which are relevant to this Level 2 SFRA. This includes:

- Ensuring that plans consider all sources of flood risk.
- Incorporating appropriate flood resistant and resilient measures within developments to ensure they can quickly return to use after flood events without the need for significant refurbishment.
- Inclusion of the Flood Risk Vulnerability Classification within [Annex 3](#).

The PPG was most recently updated in August 2022, which brought it in line with the latest updates in the 2021 NPPF revision. The key updates to the 2022 PPG include:

- The explicit inclusion of a climate change allowance within 'design flood' and the consideration of surface water flood risk.
- The Functional Floodplain starting point is now the 3.3% annual exceedance probability (AEP) event (previously 5% AEP).
- The non-residential development lifetime starting point is set at 75 years.

The 2022 PPG also provided updated information on Sequential Testing, clarifying:

- When Sequential Tests should be applied, and when it is appropriate to move on to the Exception Test.
- Definitions of key terms such as ‘reasonably available’.
- Roles and responsibilities, including an emphasis on LPAs to select an area of search and consider if the Sequential Test is passed.
- Approaches to improve efficiency and certainty.

Updated information on the Exception Test is also provided within the 2022 PPG, including:

- Definitions of relevant key terms (such as ‘wider sustainability benefits to the community’).
- A new section on how developments can demonstrate an overall reduction in flood risk.
- Demonstration of Flood Zone incompatibility, rather than showing whether ‘development is appropriate’.

1.2.2 Regional Policy

[The London Plan](#) (2021) sets out an integrated economic, environmental, transport and social framework for the development of London. Policy SI 12 of the London Plan states that Local Authorities should use their SFRA to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. These actions must be informed by the [Thames River Basin District Flood Risk Management Plan](#).

1.2.3 Local Policy

Ealing’s draft [Local Plan](#) has four policies which are directly linked to flood risk management in the borough. These are ‘Policy SP.1: A Vision for Ealing’, ‘Policy SP.2: Tackling the climate crisis’, ‘Policy G4: Open Space – London Plan Ealing LPA – local variation’, and ‘Policy G5: Urban Greening – London Plan – Ealing LPA – local variation’. This Level 2 assessment has also informed the drafting of design principles for individual development sites as set out in Chapter 4 of the draft Local Plan. The preparation of Ealing’s [new Local Plan](#) is also underpinned by an Integrated Impact Assessment, which draws on the findings of this Level 2 SFRA. There is additionally an adopted [Development Management: Development Plan Document](#) which includes ‘Policy 5.12: Ealing Local Variation – Flood Risk Management’ which provides requirements and guidance to address flood risk as part of development proposals. The Level 2 SFRA will provide site-specific recommendations to help developers to meet these policy aims.

1.2.4 Flood Zones

The Environment Agency (EA) have defined Flood Zones to show the probability of fluvial and / or tidal flooding. The Flood Zones provide indicative flood risk information and are used as part of the planning process as a tool in the Sequential and Exception Tests. The fluvial / tidal Flood Zones are defined within the PPG ‘Flood Risk and Coastal Change’ ([Table 1](#)). There are however no areas in the borough which are tidally influenced. As recommended in the Level 1 SFRA, Ealing have also defined an additional Flood Zone 3a to account for predicted surface water flood risks across the borough. ‘Flood Zone 3a’ has therefore been split into ‘fluvial’ and ‘surface water’ subsets, where the surface water flood risk uses the extents predicted for up to and including the 1% AEP return

period events. It should be noted that a site may be in both the fluvial and surface water extents of Flood Zone 3a – in such cases the policy requirements should work in tandem with equal importance. All Flood Zones included in this assessment are defined as follows:

- **Fluvial Flood Zone 1** (Low Probability): Land having a less than 0.1% annual probability of river flooding.
- **Fluvial Flood Zone 2** (Medium Probability): Land having between a 1% and 0.1% annual probability of river flooding.
- **Fluvial Flood Zone 3a** (High Probability): Land having a 1% or greater annual probability of river flooding.
- **Surface Water Flood Zone 3a** (High Probability): Land within the EA’s Risk of Flooding from Surface Water (RoFSW) flood risk extents predicted for up to and including the 1% annual probability of surface water flooding.
- **Fluvial Flood Zone 3b** (Functional Floodplain): Land within EA modelled fluvial flood risk extents predicted for up to and including the 5% AEP return period events (the 5% AEP event is used despite the change in the 2022 PPG guidance as the 3.3% AEP fluvial model is not available), allowing for the impact of flood defences. It also includes land featured as part of the EA’s Flood Storage Areas dataset.

1.2.5 Vulnerability Classifications

The flood risk vulnerability classification that is required for the Sequential Test is outlined in [Annex 3 of the NPPF](#). It is summarised in *Table 1.1*.

Table 1.1: Flood risk vulnerability classifications (as outlined in Annex 3 of the NPPF)

Essential Infrastructure
<ul style="list-style-type: none"> ● Essential transport infrastructure which has to cross the area at risk. ● Essential utility infrastructure which has to be located in a flood risk area for operational reasons e.g., infrastructure for electricity supply (including generation, storage and distribution systems). ● Wind turbines / solar farms.
Highly Vulnerable
<ul style="list-style-type: none"> ● Police and ambulance stations; fire stations and command centres; 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
<ul style="list-style-type: none"> ● Hospitals. ● Residential institutions such as care homes, children’s homes, social services homes, prisons and hostels. ● Buildings used for dwelling houses, student 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. ● Holiday or short-let caravans and camping sites (subject to a specific warning/evacuation plan).
Less Vulnerable
<ul style="list-style-type: none"> ● Police, ambulance and fire stations which are not required to be operational during flooding. ● Buildings used for shops; financial, professional, and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the More Vulnerable class; and assembly and leisure. ● Land and buildings used for agriculture and forestry. ● Waste treatment (except landfill and hazardous waste facilities). ● Minerals 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 (with adequate pollution control measures to manage sewage during flooding). ● Car parks.
Water Compatible
<ul style="list-style-type: none"> ● Flood control infrastructure. ● Water transmission infrastructure and pumping stations. ● 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 (excluding sleeping accommodation). ● Lifeguard and coastguard stations. ● Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. ● Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

1.2.6 Flood Risk Vulnerability and Flood Zone Compatibility

The [PPG Flood risk vulnerability and Flood Zone ‘incompatibility’ table](#) provides guidance on the types of development that may be considered as suitable within each Flood Zone. It sets out some circumstances where the Exception Test will need to be applied following the Sequential Test. This is shown in *Table 1.2*.

Table 1.2: Flood risk vulnerability and Flood Zone ‘incompatibility’

Flood Zone	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a	Exception Test Required †	✗	Exception Test Required	✓	✓
Zone 3b	Exception Test Required *	✗	✗	✗	✓*

Key	
✓	Development is appropriate
✗	Development should not be permitted
†	In Flood Zone 3a Essential Infrastructure should be designed and constructed to remain operation and safe in times of flood.
*	In Flood Zone 3b Essential Infrastructure that has to be there and has passed the Exception Test, and Water Compatible uses, should be designed and constructed to: <ul style="list-style-type: none"> • Remain operational and safe for users in time of flood. • Result in no net loss of floodplain storage. • Not impede water flows and not increase flood risk elsewhere.

2 SITE ASSESSMENT

2.1 Purpose

The Site Assessments completed as a part of this Level 2 SFRA have two major purposes:

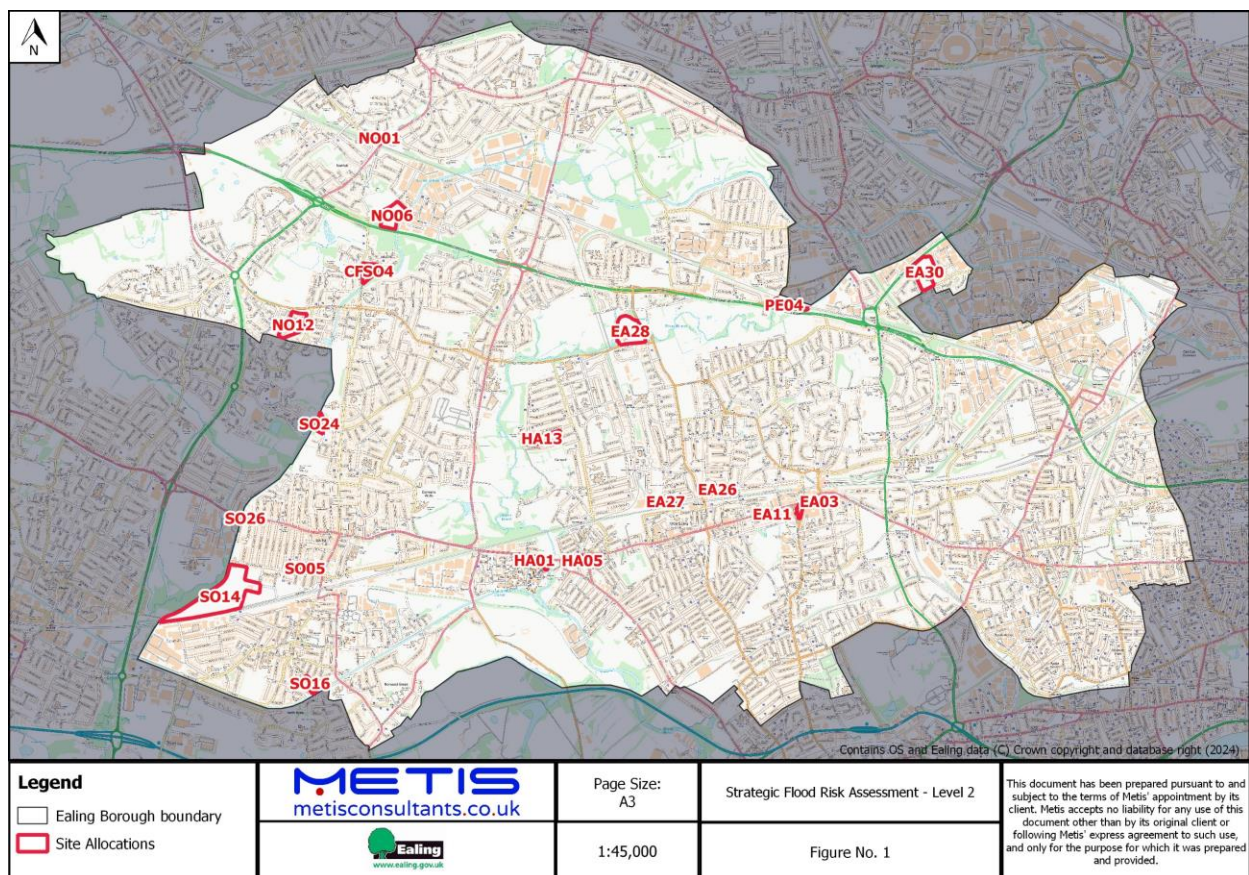
- Help LPAs apply the Sequential Test so that development is directed to areas that are at least risk of flooding.
- Provide the information needed to apply the Exception Test, checking whether a development can be built in a higher flood risk area.

The Site Assessments also provide recommendations and considerations for LPAs and prospective developers, to be used in conjunction with the guidance provided in [Section 6](#) of the Level 1 SFRA. For further information on the Level 2 SFRA methodology, refer to [Section 3](#) of this document.

2.2 Location Assessed

19 sites were assessed as part of this Level 2 SFRA. These are listed in [Table 2.1](#) and mapped in [Figure 2.1](#).

Figure 2.1: Borough map showing the location of the 19 sites targeted within the Level 2 SFRA



Note: the site IDs employed in this Level 2 SFRA reflect the original referencing system, which has now been superseded in the Regulation 19 version of the Local Plan. The amended referencing system, with reference to the original referencing, is detailed in Table 1 of the Regulation 19 Local Plan.

Table 2.1: Summary of site allocations

Site ID	Site Name	Proposed Use	Area (ha)
CFSO4	Airways Estate	Residential.	2.52
EA03	Sandringham Mews	Residential-led, mixed-use scheme with significant retail, employment, leisure and community space provision.	0.64
EA11	49 - 69 Uxbridge Road	Commercial-led mixed-use scheme with some residential and cultural / leisure facilities.	0.86
EA26	Castle House	Residential-led with some provision of affordable workspace.	0.99
EA27	Access House & T Mohan	Mixed-use intensification (industrial-led intensification with possible residential uses).	0.49
EA28	Gurnell Leisure Centre	Leisure-led scheme encompassing indoor and outdoor facilities with enabling residential use.	7.25
EA30	Twyford Abbey <i>*This site allocation is no longer being pursued.</i>	Residential and open green space.	5.39
HA01	Ealing Hospital	Residential and reprovision of car parking for hospital.	2.44
HA05	George Street Car Park	Residential-led, mixed-use scheme.	0.22
HA13	High Lane Housing Estate	Residential-led, mixed-use scheme.	3.62
NO01	Car Sales site & Northolt Leisure Centre	Residential-led, mixed-use scheme with leisure, library, employment / retail, and open space.	0.95
NO06	Northolt Driving Range	Employment-led, mixed-use scheme.	4.57
NO12	Yeading Lane II	Residential-led mixed use scheme	4.91
PE04	Alperton Lane South and Metroline Depot	Industrial-led mixed-use intensification.	1.89
SO05	Southall West London College	Residential, education and community.	1.18
SO14	The Green Quarter (Southall Gasworks)	Residential, employment uses, school and health centre.	22.00
SO16	Endsleigh Industrial Estate	Residential-led, mixed-use scheme including some industrial uses.	1.14
SO24	Cranleigh Gardens Industrial Estate & Kingsbridge Crescent	Residential, community.	1.43
SO26	Hambrough Tavern	Residential-led, mixed-use scheme.	0.17

3 METHODOLOGY

3.1 Site Selection

Sites were selected from a total of 85 sites put forward for development in Ealing’s draft Local Plan. A high-level Screening Assessment was undertaken on these sites to determine whether a Site Assessment was required (*Appendix A – Screening Assessment*). The criteria used to determine whether a Site Assessment was required is as follows:

“A Site Assessment is recommended where the extent of Flood Zone 2, Flood Zone 3a (fluvial), Flood Zone 3b (fluvial) and / or the Main River 1% AEP +35% climate change scenario) is greater than 0.49% of the site area, and the Flood Zone 3a (surface water) extent exceeds 7.5% of the site.”

7.5% has been chosen as a reasonable minimum percentage to assess the sites that are at risk of surface water flooding. This was deemed to represent both a precautionary and proportionate threshold, and whilst each site needs to be considered individually and on its own merits, employing a threshold as low as 7.5% should mean that there is sufficient space within the site to design the layout to avoid the need to locate the most vulnerable aspects of the development within the Flood Zone 3a (surface water) extent. There are 30 sites that are not identified as requiring a Site Assessment as the Flood Zone 3a (surface water) extent is below 7.5% coverage of the site, however these would still require an Exception Test as they are More Vulnerable and fall within Flood Zone 3a (surface water). These can be identified in the Screening Assessment (*Appendix A – Screening Assessment*).

Based on this assessment criteria, 19 sites were identified to require a Site Assessment. 14 sites were triggered by surface water flood risk, and five sites were triggered by fluvial flood risk (including two sites, EA30 and PE04, which were also triggered by surface water flood risk).

3.2 Analysis

The Site Assessments were carried out using datasets provided by the EA, Thames Water Utilities Limited (TWUL) and Ealing. Data was also obtained from the [Level 1 SFRA](#). Predicted flooding from surface water, sewer, fluvial, groundwater and artificial sources were analysed using the predicted proportion of each flood risk type within each site. The assessments for fluvial and surface water flood risks are based on the Flood Zones defined in the Level 1 SFRA. These are outlines of the predicted flood extents in both defended and undefended scenarios. The Flood Zones definitions are outlined in *Section 1.2.4*. The flood hazard rating used in the Site Assessments can be interpreted as shown in *Table 3.1*.

Table 3.1: Surface water flood risk hazard (HR) categories

Hazard Rating		Definition
Low	$0.5 \geq HR < 0.75$	Caution – Flood Zone with shallow flowing water or deep standing water
Moderate	$0.75 \geq HR \leq 1.25$	Dangerous for some (i.e. children) – Danger: Flood Zone with deep or fast flowing water
Significant	$1.25 > HR \leq 2.0$	Dangerous for most people – Danger: Flood Zone with deep fast flowing water
Extreme	$HR > 2.0$	Dangerous for all – Extreme danger: Flood Zone with deep fast flowing water

3.3 Assessment Template

Site Assessments were conducted on a specifically designed proforma. The sections included are summarised in *Table 3.2*.

Table 3.2: Site Assessment proforma details

Section	Contents
Current and proposed use	Development use of each site assessed
Current and proposed vulnerability classification	Identified the sites vulnerability classification as outlined in <i>Section 1.2.5</i> . For sites which may support a variety of different uses, the vulnerability classification is identified based on the most vulnerable use.
Risk summary	Percentage of the site area under each risk level for different types of flooding
Flood defences	Identifies if the site is benefitting from any fluvial flood defences
Flood Warning Areas	Identifies if the EA flood warning service is available at the site
Risk assessment	Data on risk from each flooding source, including flood depth, speed, hazard, duration, etc.
Flood mechanisms	For each flood source, how flood water behaves within the site
Site access / egress routes	Where flood-safe entry and exit routes should be located
Mitigation requirements	For each flood source, a list of mitigation measures to alleviate the flood risk for potential developments at the site. To be used in conjunction with the guidance provided in Tables 4.1, 4.2, 4.3, and 4.4 of the Level 1 SFRA .
Safety of development	Analysis of how secure the development is against future flooding, including climate change considerations. This section also identifies if the site can be developed based on Exception Test criteria.

Seven site-specific maps are appended to each Site Assessment proforma (*Appendix B – Site Assessments*). These are summarised in *Table 3.3*.

Table 3.3: Summary of maps

Number	Figure	Description
1	Fluvial Flood Depth (1% AEP + 35% Climate Change Allowance Event)	Provides the maximum flood depth for the fluvial defended 1% AEP + 35% climate change flood event. Data was extracted from EA models for River Brent. The 35% climate change event was chosen to review the maximum fluvial flood depth at the sites as it is closest to the 'higher' allowance peak river flow allowance for the London Management Catchment.
2	Fluvial Flood Hazard (1% AEP + 35% Climate Change Allowance Event)	Provides the maximum flood hazard for the fluvial defended 1% AEP + 35% climate change flood event. Data was extracted from EA models for River Brent. The 35% climate change allowance was used.
3	Surface Water Flood Depth (1% AEP Rainfall Event)	Provides the predicted surface water flood depth across a site using EA RoFSW data for a 1% AEP event. This is a detailed representation of the Flood Zone 3a (Surface Water) extent as defined in the Level 1 SFRA and <i>Section 1.2.1</i> .

Number	Figure	Description
4	Surface Water Flood Hazard (1% AEP Rainfall Event)	Provides information on the predicted hazard of surface water flooding, based on EA RoFSW mapping for a 1% AEP event. Details about how hazard can be interpreted are shown in <i>Table 3.1</i> .
5	Thames Water Utilities Limited (TWUL) Sewer Flooding Records	Provides the sewer flood incidences recorded by TWUL at four-digit postcode resolution. This includes records from when incidents were first captured in the database up until 01/11/2023, when it was received from TWUL.
6	Areas Susceptible to Groundwater Flooding	Provides the strategic scale map of groundwater flood areas on a 1km grid.
7	Reservoir Flood Risk - Wet day	Provides the individual flood extents for all large, raised reservoirs in the event that they were to fail and release the water held on a “wet day” when local rivers had already overflowed their banks.

3.4 Data Sources

A number of different datasets were used in this assessment, a description of these datasets, their purpose and their source are outlined in *Table 3.4*.

Table 3.4: Datasets used in the Site Assessments

Category	File name	Description	Data source	Purpose
Base map	Basemap	Polygons of streets, buildings, and other features in the area	Ordnance Survey (OS) Master Map	Map creation
	Ealing borough boundary	Polygon demarcating the borough boundary	OS Open Data	Defining study area; geographical boundary for other data needed
	OS Open Rivers	Line files showing the watercourses in the borough	OS Open Data	Determining locations of watercourses
	Reg19 sites Final	Polygons giving outlines of 85 proposed development sites in the borough	Ealing 2023	Conducting screening and site level assessments
Digital Terrain Model	LiDAR	Raster containing ground elevation data	EA 2023	Determining low elevation areas susceptible to surface water flooding
Flood defences	Spatial_Flood – Defences (without standardised attributes)	Lines showing EA flood defences which have a standard of protection equal to or better than 1% AEP for rivers and 0.5% AEP from the sea. (Some additional defences are also shown).	EA Web Map Service (WMS)	Analysing how flood defences affect current and future fluvial flooding
	Spatial_Flood – Defences (incl. standardised attributes)	Lines showing all flood defences currently owned, managed or inspected by the EA	EA WMS	

Category	File name	Description	Data source	Purpose
	Reduction_In_Risk_Of_Flooding_From_Rivers_And_Sea	Polygons showing the areas that have reduced flood risk from rivers and sea due to the presence of flood defences	EA WMS	
Flood Warning Areas	Flood_Warning_Areas	Polygon showing the areas where the EA Warning Service is available	EA WMS	Determining if site users can sign up to the EA flood warning service
Groundwater	Areas_Susceptible_to_Groundwater_Flood	Provides strategic scale map of areas susceptible to groundwater flooding on a 1km grid	EA 2023	Analysing current groundwater flood risk
Flood Map for Planning	Flood_Zone_2	Polygons showing land with annual probability of river flooding between 1% and 0.1%	EA 2023	Prioritising sites for assessment
	Flood_Zone_3	Polygons showing land having a 1% or greater annual probability of river flooding	EA 2023	Prioritising sites for assessment
	Flood_Zone_3b	Polygons showing land within EA modelled fluvial flood risk extents predicted for up to and including the 5% AEP extents, and land included within the EA's Flood Storage Areas dataset	Level 1 SFRA	
Risk of Flooding from Surface Water (RoFSW)	RoFSW_1inXX_Extent	Polygons showing flood extent, depth, and hazard values for rainfall scenarios with a 3.33% AEP, 1% AEP and 0.1% AEP chance of occurring in any given year. Hazard calculated from flood depth and velocity.	EA 2023	Prioritising sites for assessment; Analysing current and future surface water flood risk; Creating surface water flood risk mitigation plan
	RoFSW_1inXX_Depth			
	RoFSW_1inXX_Hazard			
Risk of Flooding from Reservoirs	Reservoir_Flood_Extent_Wet_Day	Map showing the largest area that might be flooded if a reservoir were to fail and release the water it holds on a wet day i.e. when rivers are at capacity	EA 2023	Analysing current flood risk from reservoir breach
Sewer flood records	Ealing Sewer Flooding Records 1-11-2023 REDACTED	Database of historic sewer flooding incidents by four-digit postcode	TWUL 2023	Sewer flood risk assessment

Category	File name	Description	Data source	Purpose
River model data	River Brent	Data from EA-generated model of River Brent	EA 2017	Fluvial flood risk assessment (current and future); Determining climate Change allowance extents; Creating fluvial flood risk mitigation plan; Applying Exception Test

4 GENERAL REQUIREMENTS

Table 4.1 outlines the general requirements that all of the sites within this Level 2 SFRA must follow. They have been referenced in the individual Site Assessments (*Appendix B – Site Assessments*) to make it clear where they are appropriate to be applied to the site. Further information on the mitigation requirements can be found in Tables 4.1, 4.2, 4.3, and 4.4 of the [Level 1 SFRA](#). These set out the requirements for major developments, minor developments, change of use (including changes to prior approval developments), and individual sites (from other flood risk sources).

A climate change allowance of 35% has been used to set out the recommendations. This allowance is used for master planning purposes only. Developers submitting planning applications should refer to the [Flood risk assessments \(FRAs\): climate change allowances](#) guidance. The fluvial Flood Zones in the borough can be viewed in the Level 1 SFRA [Webmap](#).

Table 4.1: General mitigation requirements for the site allocations

No.	Mitigation Requirement	Applicable Area	
		Fluvial	Surface Water
4.1	There should be no net loss of floodplain storage within new developments. Only Essential Infrastructure (subject to the Exception Test) and Water Compatible infrastructure are permitted.	Flood Zone 3b and Flood Zone 3a	Flood Zone 3a (1% AEP event)
4.2	Flood resistance measures should be considered where predicted flood depths are less than 0.3m. Flood resilience measures should be considered where predicted flood depths are greater than 0.6m. Predicted flood depths between 0.3m and 0.6m should be analysed on a case-by-case basis to determine if resistance measures are sufficient. Design plans should show floor levels (relative to Ordnance Datum) and predicted flood depths.	All	
4.3	Flood storage compensation needs to be provided if permissible development decreases the volume of a fluvial floodplain or surface water flood area. The compensatory storage provided must equal or exceed the storage lost to ensure there will be no net loss of flood storage. Where developments are proposed and within Flood Zone 3a (surface water), floodplain compensation must account for predicted flood depths for the 3.3% AEP and 1% AEP RoFSW mapping or depths predicted by site specific modelling.	Flood Zone 3b and Flood Zone 3a	Flood Zone 3a (1% AEP event)
4.4	Flood Warning and Emergency Plans need to feature measures to manage flood risk before, during, and after a flood, reducing the potential human impact of any flood event and making developments as resilient to flooding as possible. Key considerations can be found in the PPG.	All	

	<i>*Not required for minor and change of use developments where it can be demonstrated that neither a site-specific FRA, drainage strategy, or the second requirement of the Exception Test is necessary.</i>		
4.5	Residual risk should be mitigated through flood resilient / resistant designs and emergency planning to make sure the proper measures are in place to offer protection.	Entire area at risk	
4.6	Development sites within 8m of a non-tidal main river, flood defence structure or culvert may require a Flood Risk Activity Permit.	8m buffer area around non-tidal main rivers	
4.7	Development sites within specified distances of ordinary watercourses may require an approved ordinary watercourse consent.	5m buffer area around ordinary watercourses	
4.8	All basement rooms must have internal access and egress to a higher floor above the design flood level which can be utilised as part of emergency evacuation procedures.	Flood Zone 3a, Flood Zone 2	Flood Zone 3a (1% AEP event)
4.9	As part of any assessment for basement dwellings, evidence needs to be submitted to confirm the local water table level.	Flood Zone 3a, Flood Zone 2, Flood Zone 1	Flood Zone 3a (1% AEP event)

APPENDICES

Appendix A – Screening Assessment

Appendix B – Site Assessments

- CFSO4 Airways Estate
- EA03 Sandringham Mews
- EA11 49 – 69 Uxbridge Road
- EA26 Castle House
- EA27 Access House & T Mohan
- EA28 Gurnell Leisure Centre
- EA30 Twyford Abbey
- HA01 Ealing Hospital
- HA05 George Street Car Park
- HA13 High Lane Housing Estate
- NO01 Car Sales site & Northolt Leisure Centre
- NO06 Northolt Driving Range
- NO12 Yeading Lane II
- PE04 Alperton Lane South and Metroliner Depot
- SO05 Southall West London College
- SO14 The Green Quarter (Southall Gasworks)
- SO16 Endsleigh Industrial Estate
- SO24 Cranleigh Gardens Industrial Estate & Kingsbridge Crescent
- SO26 Hambrough Tavern