WtFR Ltd

Flood Risk Assessment

7 Fore Street, Pinner, HA5 2HX

Date: 28th July 2025

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Issue sheet

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1 Introduction

National planning policy and, increasingly, local planning policy require a Flood Risk Assessment (FRA) to support development planning applications. In particular, to demonstrate how risks from all sources of flooding to the site and elsewhere will be managed.

This report details the FRA in respect of development proposals at 7 Fore Street, Pinner, HA5 2HX. A full assessment of the flood risk to the site and consideration of the surface water management as a result of the development has been considered as part of this analysis.

Data has been analysed from several sources to inform this assessment, including: the Environment Agency (EA), the British Geological Society (BGS), National Soil Research Institute (NSRI), Ordnance Survey (OS), commercially available historical mapping and relevant strategic documents developed by Hillingdon Council, in their capacity as the Lead Local Flood Authority and Local Planning Authority.

2 Policy Requirements

2.1 National Planning Policy

Paragraph 181 of the NPPF states "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[63]. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (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;

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".

Footnote 63 states "A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use".

Furthermore paragraph 30 of the Planning Practice Guide on Flood Risk and Climate Change states "A site-specific flood risk assessment is carried out by (or on behalf of) a developer to

assess the flood risk to and from a development site. Where necessary, the assessment should accompany a planning application submitted to the local planning authority. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users.

The objectives of a site-specific flood risk assessment are to establish:

- whether a proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- evidence for the local planning authority to apply (necessary) the Sequential Test, and;
- whether the development will be safe and pass the Exception Test, if applicable".

Continuing paragraph 31 of the Planning Practice Guidance quotes "The information provided in the flood risk assessment should be credible and fit for purpose. Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the interactive flood risk maps available on the Environment Agency's web site.

A flood risk assessment should also be appropriate to the scale, nature and location of the development. For example, where the development is an extension to an existing house (for which planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, the local planning authority would generally need a less detailed assessment to be able to reach an informed decision on the planning application. For a new development comprising a greater number of houses in a similar location, or one where the flood risk is greater, the local planning authority would need a more detailed assessment".

2.2 Local Planning Policy

Local Authorities consider flood risk through relevant environmental and climate change policies which enforce the requirements of the NPPF. Relevant local policy, as outlined by Hillingdon Council, is contained within the;

i) Strategic Flood Risk Assessment

ii) Local Flood Risk Management Strategy

The Strategic Flood Risk Assessment (SFRA) and the Local Flood Risk Management Strategy (LFRMS) are key sources of flood risk specific information for the area. The SFRA provides a more detailed review of flood risks and recommendations for ensuring developments can be constructed and operated safely in accordance with the NPPF. Furthermore, reference to the London Plan Policy 5.12 is considered within this assessment.

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2.3 Flood Risk Zones, Vulnerability and Classification

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning available on the Environment Agency's web site, as indicated in the table below.

Table 1 - Flood Zones

Flood Zone	Definition
Zone 1 *Low Probability*	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 *Medium Probability*	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a *High Probability*	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b *The Functional Floodplain*	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 2 - Flood Risk Vulnerability Classification

Essential Infrastructure
Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including 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 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 (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
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.

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Non–residential uses for health services, nurseries and educational establishments. Landfill* and sites used for waste management facilities for hazardous waste. Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable
Police, ambulance and fire stations which are not required to be operational during flooding. Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill* and hazardous waste facilities). Minerals 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.
Water Compatible Development
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.

* Landfill as defined in Schedule 10 to the Environmental Permitting (England and Wales) Regulations 2010.

Table 3 - Flood risk vulnerability and flood zone 'compatibility'

Flood Zones	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.

Notes to *Table 3*:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

2.4 Minor development in context of Planning Practice Guidance

Section 17 of the Planning Practice Guidance for Flood Risk and Coastal Change defines minor development as:

- minor non-residential extensions with a footprint less than 250 square metres;
- development that does not increase the size of buildings e.g. alterations to external appearance;
- householder development, e.g. sheds, garages, games rooms etc., within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

Furthermore section 18 of the Planning Practice Guidance for Flood Risk and Coastal Change looks at whether minor developments likely to raise flood risk issues? It states:

Minor developments are unlikely to raise significant flood risk issues unless:

- they would have an adverse effect on a watercourse, floodplain or its flood defences;
- they would impede access to flood defence and management facilities, or;

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- where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

The Environment Agency's advice on flood risk assessments is helpful for ensuring extensions or alterations are designed and constructed to conform to any flood protection already incorporated within the property and include flood resilience measures in the design.

The Environment Agency's advice for minor developments for household extensions is to ensure floor levels are either no lower than existing floor levels or 300 millimetres (mm) above the estimated flood level.

3 Summary of site characteristics and development proposals

The proposals are for a side and rear extension at 7 Fore Street, Pinner, HA5 2HX. The site is a brownfield / developed plot. The approximate area of the site is 340m^2, of which 200m^2 is covered by impermeable surfaces such hardstanding and roofing. The proposals are classified as minor development in the context of Planning Policy Guidance.

Figure 1 provides the location details and

Figure 2 shows an aerial photograph of the development site.

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Figure 1 - Detailed location plan of the development site, highlighted.

Figure 2 - Aerial photograph of the development site.

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Figure 3 shows the proposed ground floor layout for the development compared to *Figure 4* as existing.

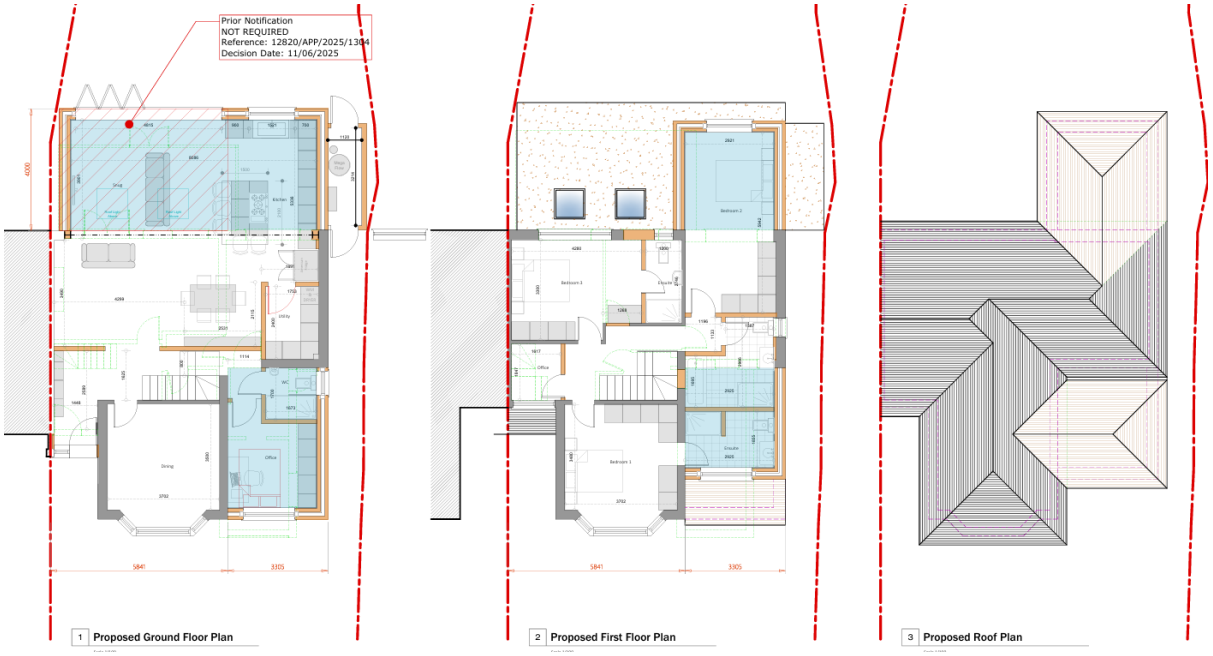

Figure 3 - Proposed ground floor plan

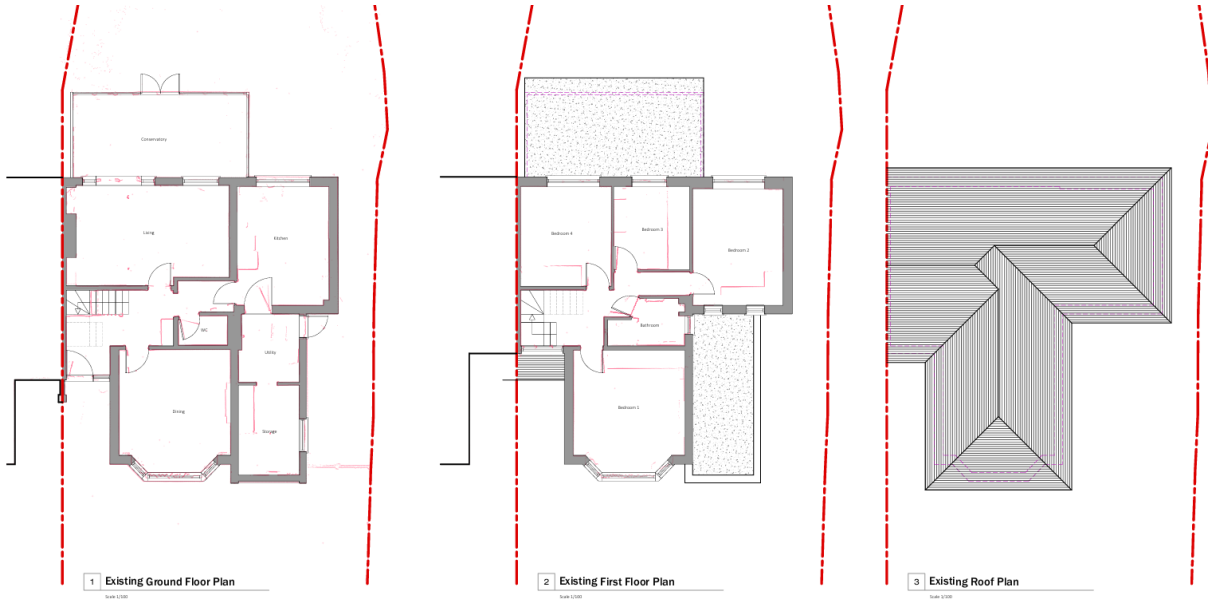

Figure 4 - Existing ground floor plan.

Figure 5 – Existing elevations

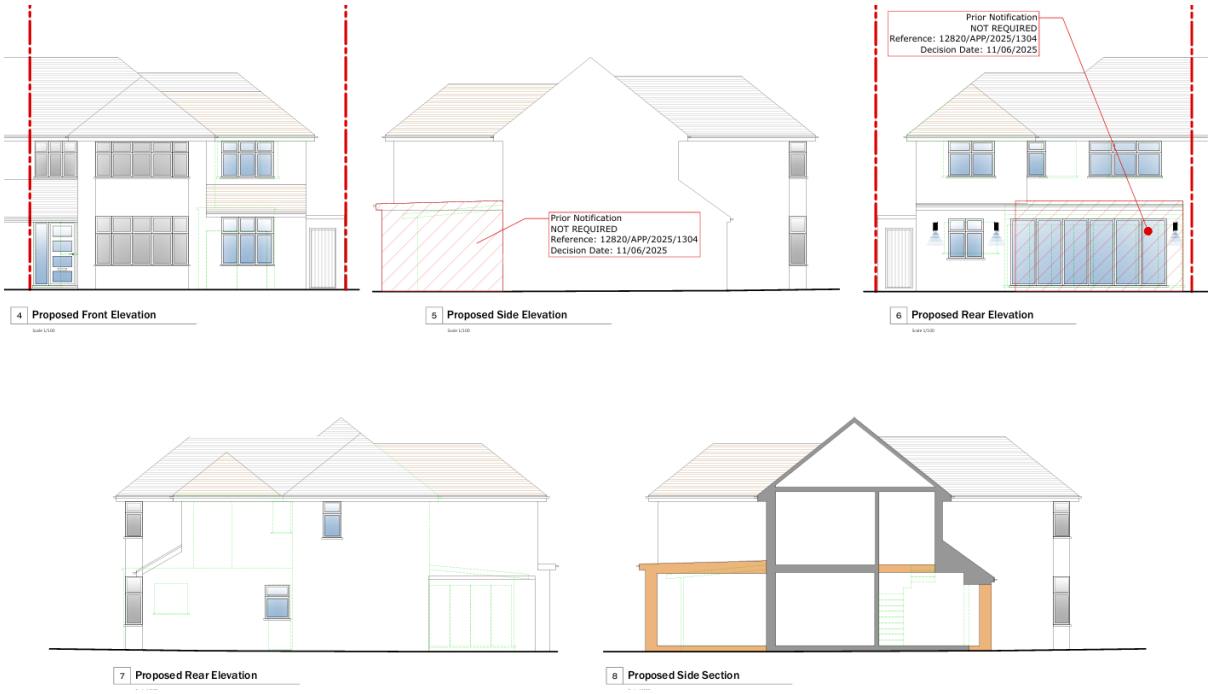

Figure 6 – Proposed elevations

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The development will result in no change in impermeable area as the works will be constructed over existing hardstanding areas. There will be an increase of 25.6m^2 in overall footprint.

Residential dwellings are classified as More Vulnerable development within *Table 2 - Flood Risk Vulnerability Classification* of the Planning Practice Guidance.

4 Sources of flooding

4.1 Fluvial/Tidal

The Environment Agency's Flood Map for Planning (Rivers and Sea) identifies fluvial and tidal flood zones and provides an indication of whether these zones are protected, due to the presence of flood defences. *Figure 7*, below, presents the Flood Map for the surrounding area and identifies the development site to lie within Flood Zone 2, and having between a 1 in 100 year and a 1 in 1000 year annual probability of river flooding.

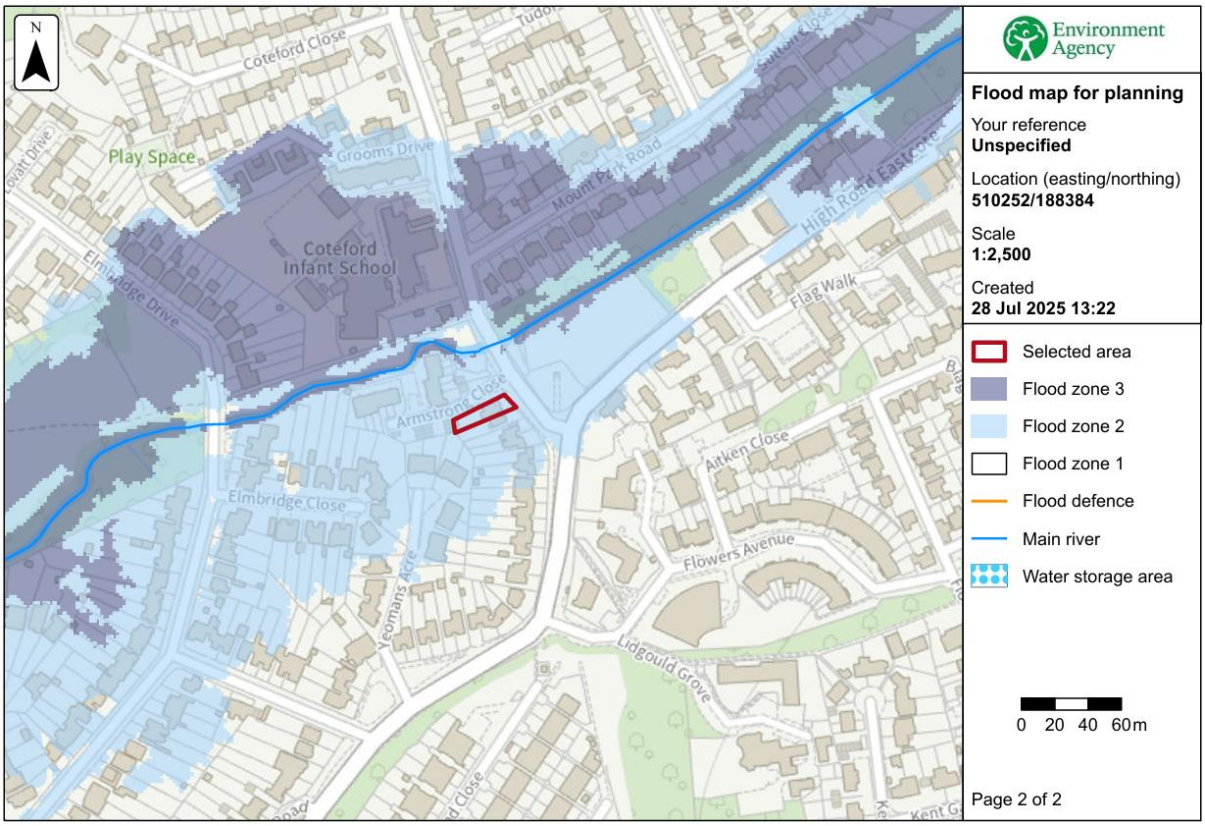

Figure 7 - Flood Map for Planning (Rivers and Sea)

4.2 Surface Water

The Environment Agency's updated Risk of Flooding from Surface Water (RoFSW) identifies pluvial flood risk. Figure 8, below, presents the surface water flood map for the development site and the surrounding area in the long-term scenario allowing for climate change, up to 2060.

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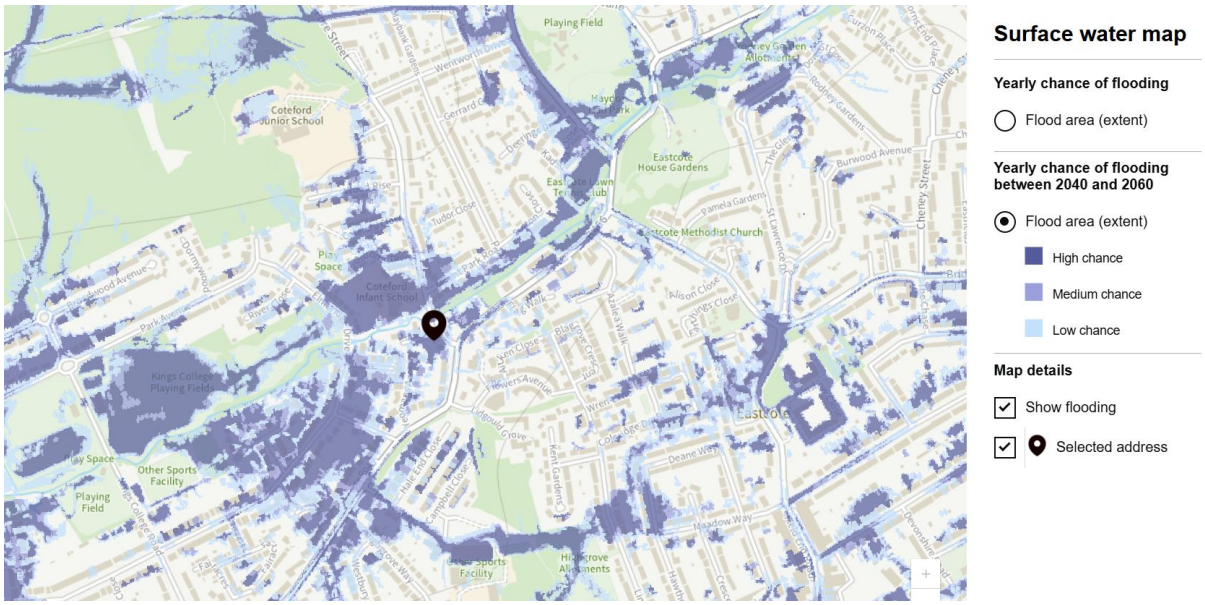

Figure 8 - Flood Map for Surface Water

The surface water flood map shows that area in the vicinity of the development site is at High risk of surface water flooding. High risk means that the probability of flooding in any given year is greater than 3% (1 in 30 year). The area of high risk is where the side extension is proposed. For the rear extension, this area is classed as very low risk.

Further mapping from the West London SFRA, see Figures 9, 10 and 11 show that the depth of flooding in 200mm, 300mm and 600mm scenarios.

These show high risk in areas of the development in the 200mm depth scenario. Some flooding (medium risk) occurs in the rear garden, that may impact the rear extension. Depths of 300mm are not predicted for the side extension; this extend to all parts of the proposed development for depths of 600mm. To err on the side of caution depths of 300mm shall be used to calculate flood compensatory storage and flood mitigation

measures.

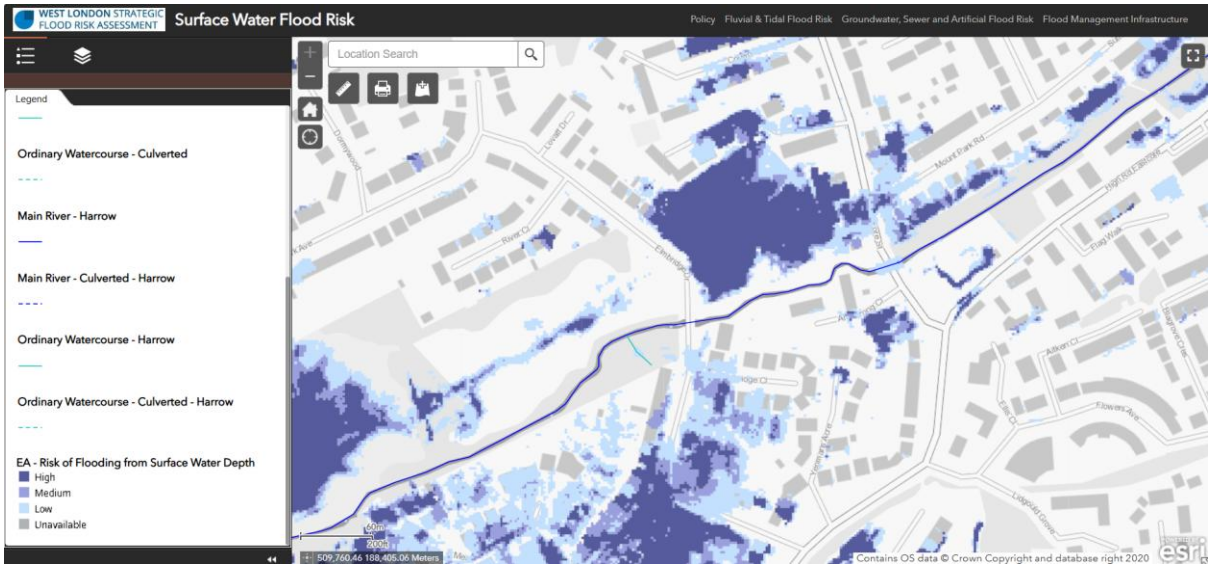

Figure 9 – Surface water 200mm depth risk of flooding

Figure 10 - Surface water 300mm depth risk of flooding

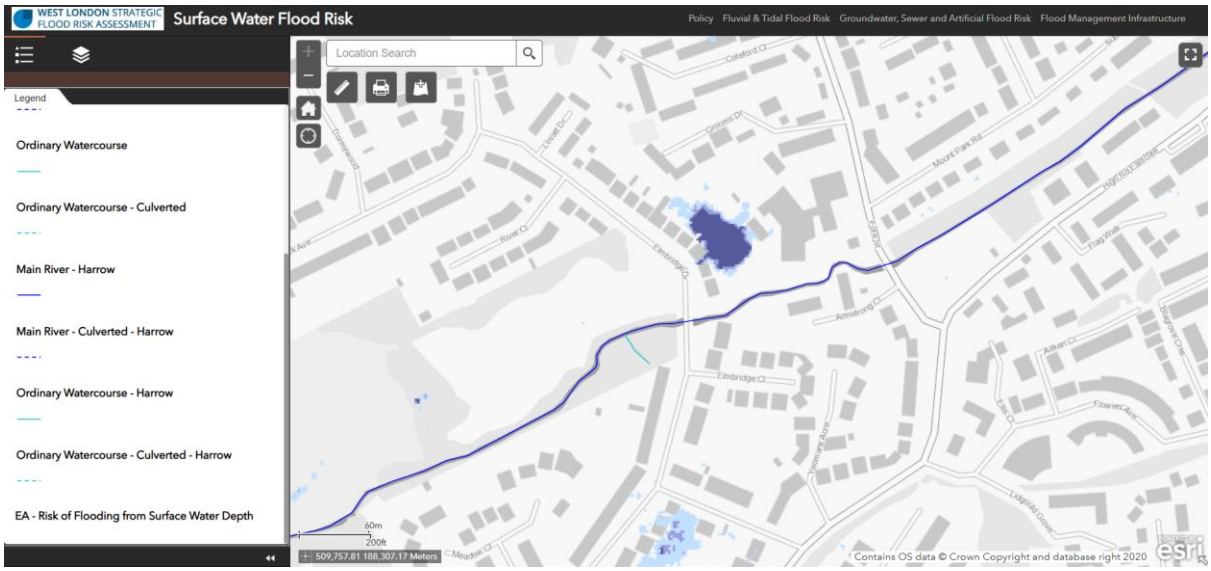

Figure 11 - Surface water 600mm depth risk of flooding

4.3 Reservoir

The development is at very low risk from reservoir flooding. Reservoir flooding is extremely unlikely to happen. 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 Environment Agency ensures that reservoirs are inspected regularly, and essential safety work is carried out.

4.4 Groundwater

The Environment Agency use flood alert data to assess the risk of flooding from groundwater. Flooding from groundwater is unlikely in this area.

The Environment Agency's Groundwater Vulnerability Map indicates that the development site is situated over an area classed as 'medium', as shown in Figure 12.

Further analysis shows that the development site is situated over a Groundwater Source Protection Zone – Zone III.

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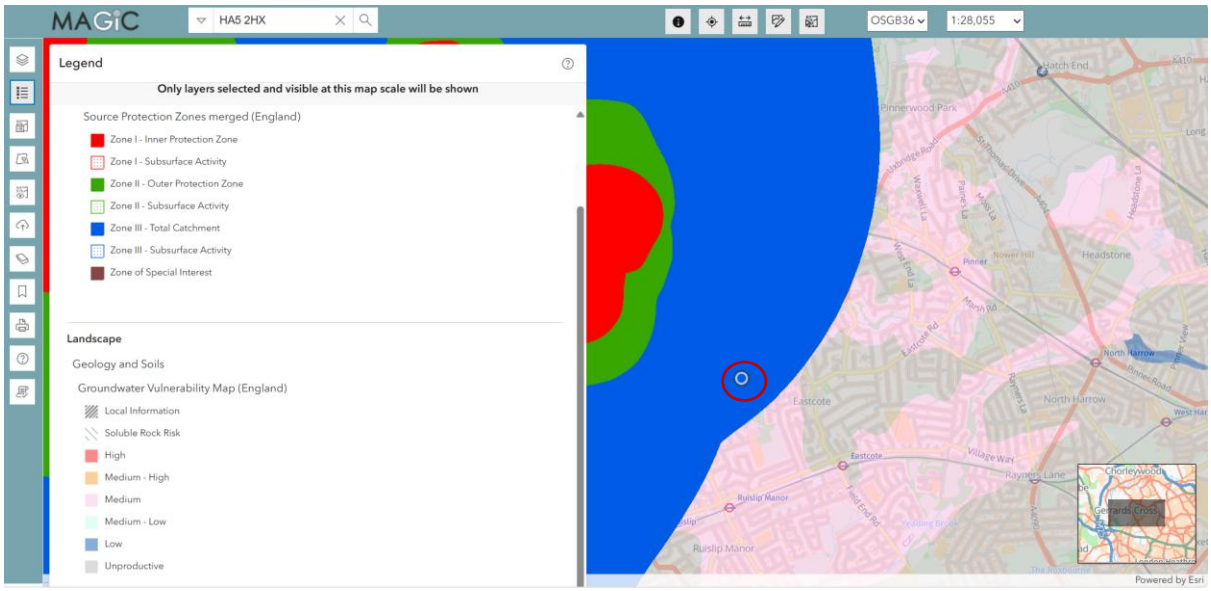

Figure 12 - Groundwater Vulnerability Map, site location highlighted.

Due to the propsed development requiring no groundworks, it is not expected that groundwater will be affected.

4.5 Flood history

A review of strategic flood risk documents has not identified there to be a history of flooding on the site.

4.6 Flood displacement

The development will increase the overall footprint by 25.6m^2. The side extension measures 8m^2, with the rear extension being 17.6m^2.

Both the side extension and rear extension are in areas of flood risk. To err of the side of caution flood depths of 300mm will be considered. As such a volume of 7.68m^3 (25.6x0.3) will need to be compensated. As such it is proposed that flood compensation takes within the rear garden, ensuring hydraucial connectivity and safeguarding there is no overall increase in flood risk.

4.7 Summary of flood risk and key issues to be managed

- The proposals are for a rear and side extension.
- The site is a brownfield / developed plot.
- The development will result in and increase of 25.6m^2 in impermeable area. This can be compensated by providing 7.68m^3 of storage within the rear garden.
- The site is within Flood Zone 2, and having between a 1 in 100 and a 1 in 1000 year annual probability of river flooding.
- In terms of surface water, the area of the extensions are at high risk of flooding, with depths of up to 300mm predicted.

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- There is currently a potential overland pluvial flow route through the development. The development will maintain a possible flow route to the north and between properties.

5 Surface Water Drainage

The existing runoff rate for the site has been calculated using the Modified Rational Rainfall Method given the site is already developed methodology. Table 4 details the approach to estimating the existing runoff rate.

Table 4 - Existing Runoff Calculation

Modified Rational Rainfall Method

where Q = 2.78 * Cv * Cr * Ri * A

CV =	0.75	fully impermeable areas, e.g. roads and hardstanding
Cr =	1.3	Routing Coefficient (CIRIA C697 recommends a value of 1.3)
Ri =	120 mm	rainfall intensity
A =	0.07 ha	current impermeable area
Q =	**23 l/s**	

At present the site drains via the public sewerage system at Q = 23 l/s.

6 Hierarchy of disposing surface water

The Planning Practice Guidance and part H of the Building Regulations state that "generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

- into the ground (infiltration);
- to a surface water body;
- to a surface water sewer, highway drain, or another drainage system;
- to a combined sewer".

6.1 Infiltration

Records from the British Geological Survey have been reviewed to understand the geology of the area. These show that the site is underlain partially by the London Clay Formation consisting of clay and silt, and the Lambeth Group consisting of sands, silts, clays or gravel beds of the Harwich Formation. Such soils may be suitable for infiltration. However, the site is over a source protection zone and as such infiltration is not advised.

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6.2 Surface Water Body

There is not a watercourse in the immediate vicinity. As such it is not to be considered to be accessible.

6.3 Surface Water or Combined Sewer

There is a public sewerage system available, and it is proposed that surface water is discharged to this system with separate connections to the foul and surface water systems, where available.

7 Use of SuDS

The NPPF, Planning Practice Guide and the Ministerial Statement promote the use of SuDS as a priority to aid the disposal of surface water from new developments.

Due to the minor nature of the development proposal there is limited capacity to include SuDS measures to minimise surface water discharge.

8 Management of flood risk

8.1 Critical / design flood

The analysis of flood risk from fluvial and tidal sources shows that the site is within Flood Zone 2, and having between a 1 in 100 and a 1 in 1000 year annual probability of river flooding.

A review of strategic flood risk documents has not identified there to be a history of flooding on the site.

Surface water flood risk information shows the vicinity of the development site is at High risk of surface water flooding. High risk means that the probability of flooding in any given year is greater than 3% (1 in 30 year). The area of high risk is where the side extension is proposed. For the rear extension, this area is classed as very low risk.

The finished floor level should, therefore, be set no lower than existing in line with Environment Agency guidance for minor development.

The development will increase the overall footprint by 25.6m^2. The side extension measures 8m^2, with the rear extension being 17.6m^2.

Both the side extension and rear extension are in areas of flood risk. To err of the side of caution flood depths of 300mm will be considered. As such a volume of 7.68m^3 (25.6x0.3) will need to be compensated. As such it is proposed that flood compensation takes within the rear garden, ensuring hydrauciall connectivity and safeguarding there is no overall increase in flood risk.

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The development will not detrimentally affect overland flood flows.

8.2 Surface water runoff

The development will result in an 25.6m^2 increase in building area, however this is all currently over existing hardstanding. As such, no attenuation storage is required although SuDS have been considered to better manage surface water discharges.

There is a public sewerage system available, and it is proposed that surface water is discharged to this system with separate connections to the foul and surface water systems, where available.

Due to the minor nature of the development proposal, there is limited capacity to include SuDS measures to minimise surface water discharge.

As such, the proposed development will not increase the risk of flooding elsewhere from surface water sources.

8.3 Flood Resistance and Resilience Measures

Considering the flood risk to the development alongside best practice guidance for flood resilient design, 'Improving the Flood Performance of New Buildings' (CLG, 2007), should be considered.

With flood depths predicted to be 300mm; it is proposed that flood resilience/resistant measures are incorporated to at least 600mm with the proposed extensions.

8.4 Safe refuge, access and egress

In the event of flooding, users of the development will have internal access to a higher floor for safe refuge.

8.5 Flood plan

As the development is situated in a high risk of pluvial flooding a flood warning and evacuation plan should be established and implemented post development. An indicative flood plan is provided below.

Recommended Flood Plan:

Before a flood

- Ensure you have adequate flood insurance. The Government backed Flood-Re scheme now makes insurance more accessible for flood risk properties;
- Register for the flood warning service and note the type available and its lead in times;
- Prepare and keep a list of all your contacts to hand or save them on your mobile phone/tablet;
- Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture and electrical equipment;
- Know how to turn off gas, electricity and water supplies;
- Prepare a flood kit of essential items and store in an easily remembered / accessible location. It can include copies of important documents, a torch, a battery-powered or

wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.

On receipt of a flood warning

- Tune into your local radio station on a battery or wind-up radio;
- Fill jugs and saucepans with water;
- Grab your already prepared flood kit;
- Collect blankets, torch, first aid kit, medication and food;
- Move important documents, personal items, valuables and lightweight belongings upstairs or to high shelves;
- Raise large items of furniture or put them into large bags;
- Move people, outdoor belongings, cars and pets to higher ground;
- Switch off water, gas and electricity at the mains when water is about to enter your home. Do not touch sources of electricity when in standing water;
- Fit flood protection products, if you have them, for example flood boards, airbrick covers and sandbags;
- If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths;
- Know your means of escape;
- Listen to the advice of the emergency service and evacuate if told to do so;
- Avoid walking or driving through flood water. 300mm of fast flowing water can knock over an adult and two feet of water can move a car.

After a flood

- If you have flooded, contact your insurance company as soon as possible;
- Take photographs and videos of your damaged property as a record for your insurance company;
- Contact your local authority for information on grants and charities that may be available to help you;
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outwear, including gloves, wellington boots and a face mask;
- Have your electrics, central heating and water checked by qualified engineers before switching them back on.

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9 Conclusions

The analysis of flood risk from fluvial and tidal sources shows that the site is within Flood Zone 2, and having between a 1 in 100 and a 1 in 1000 year annual probability of river flooding.

A review of strategic flood risk documents has not identified there to be a history of flooding on the site.

Surface water flood risk information shows the vicinity of the development site is at High risk of surface water flooding. High risk means that the probability of flooding in any given year is greater than 3% (1 in 30 year). The area of high risk is where the side extension is proposed. For the rear extension, this area is classed as very low risk.

The finished floor level should, therefore, be set no lower than existing in line with Environment Agency guidance for minor development.

The development will increase the overall footprint by 25.6m^2. The side extension measures 8m^2, with the rear extension being 17.6m^2.

Both the side extension and rear extension are in areas of flood risk. To err of the side of caution flood depths of 300mm will be considered. As such a volume of 7.68m^3 (25.6x0.3) will need to be compensated. As such it is proposed that flood compensation takes within the rear garden, ensuring hydrauciall connectivity and safeguarding there is no overall increase in flood risk.

The development will result in an 25.6m^2 increase in building area, however this is all currently over existing hardstanding. As such, no attenuation storage is required although SuDS have been considered to better manage surface water discharges.

There is a public sewerage system available, and it is proposed that surface water is discharged to this system with separate connections to the foul and surface water systems, where available.

Due to the minor nature of the development proposal, there is limited capacity to include SuDS measures to minimise surface water discharge.

Considering the flood risk to the development alongside best practice guidance for flood resilient design, 'Improving the Flood Performance of New Buildings' (CLG, 2007), should be considered.

With flood depths predicted to be 300mm; it is proposed that flood resilience/resistant measures are incorporated to at least 600mm with the proposed extensions

As such, the proposed development will not increase the risk of flooding elsewhere from surface water sources.

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Based on the likely flooding risk, it is considered that the proposed development can be operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.