# 27 Devonshire Road

## Flood Risk Assessment

Job Number: 1222

| Date | Version | Notes/Amendments |
|---|---|---|
| July 2022 | 1 | Issued for Information |
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| Acronyms | |
|---|---|
| **AOD** | Above Ordnance Datum |
| **CIRIA** | Construction Industry Research and Information Association |
| **EA** | Environment Agency |
| **FRA** | Flood Risk Assessment |
| **NPPF** | National Planning Policy Framework |
| **PPG** | Planning Practice Guidance |
| **SFRA** | Strategic Flood Risk Assessment |

# Introduction

Flume Consulting Engineers have been appointed to undertake a Flood Risk Assessment for the proposed development at 27 Devonshire Road, London N9 8NG.

This FRA has been carried out in accordance with the National Planning Policy Framework (NPPF) and the Planning Practice Guidance 'Flood Risk and Coastal Change'. This FRA also incorporates advice and guidance from the Environment Agency (EA), the Strategic Flood Risk Assessment (SFRA) produced by the London Borough of Enfield and CIRIA documents.

The Environment Agency's (EA) indicative floodplain map shows that the site is located in Flood Zone 2. This assessment will therefore focus on the flood risk to the site from watercourses, as well as from other sources.

## Site Description and Location

The existing property is a two-storey mid terrace dwelling. To the rear (east) of the property is an existing hard and soft landscaped area, with a large space between this property and the adjacent property at the rear which is set against the boundary line.

The dwelling fronts onto Devonshire Road, occupied entirely by similar dwelling types. A pedestrian footpath runs adjacent to the site boundary and the main carriageway.

The Brimsdown Ditch flows within 0.50 kilometres from the development, and the Salmon Brook (upstream Deephams STW) flows within 1 kilometres from the development, which is the source of the fluvial flood risk.

The site postcode is N9 8NG and the OS grid reference is TQ 35369 94146.

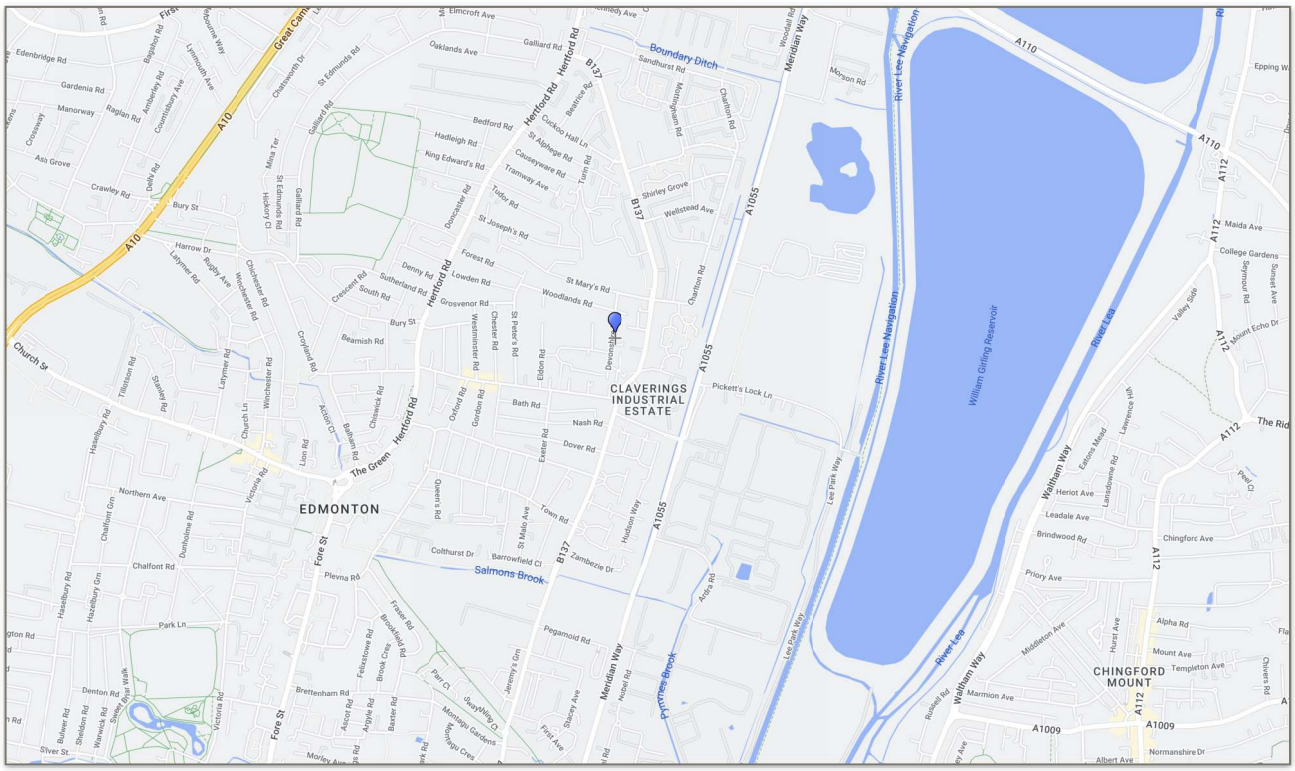


**FIGURE 1. SITE LOCATION**

## Development Proposal

The developed proposals are for a side and rear extension, which replaces a positively drained area and garage (Figure 2).

The proposed extension will be finished throughout to the same floor level as the existing ground floor, and will be accessed via main entrance. Vehicular access will be maintained and remain unchanged from the existing case (via Devonshire Road). Pedestrian street access is also unaffected.

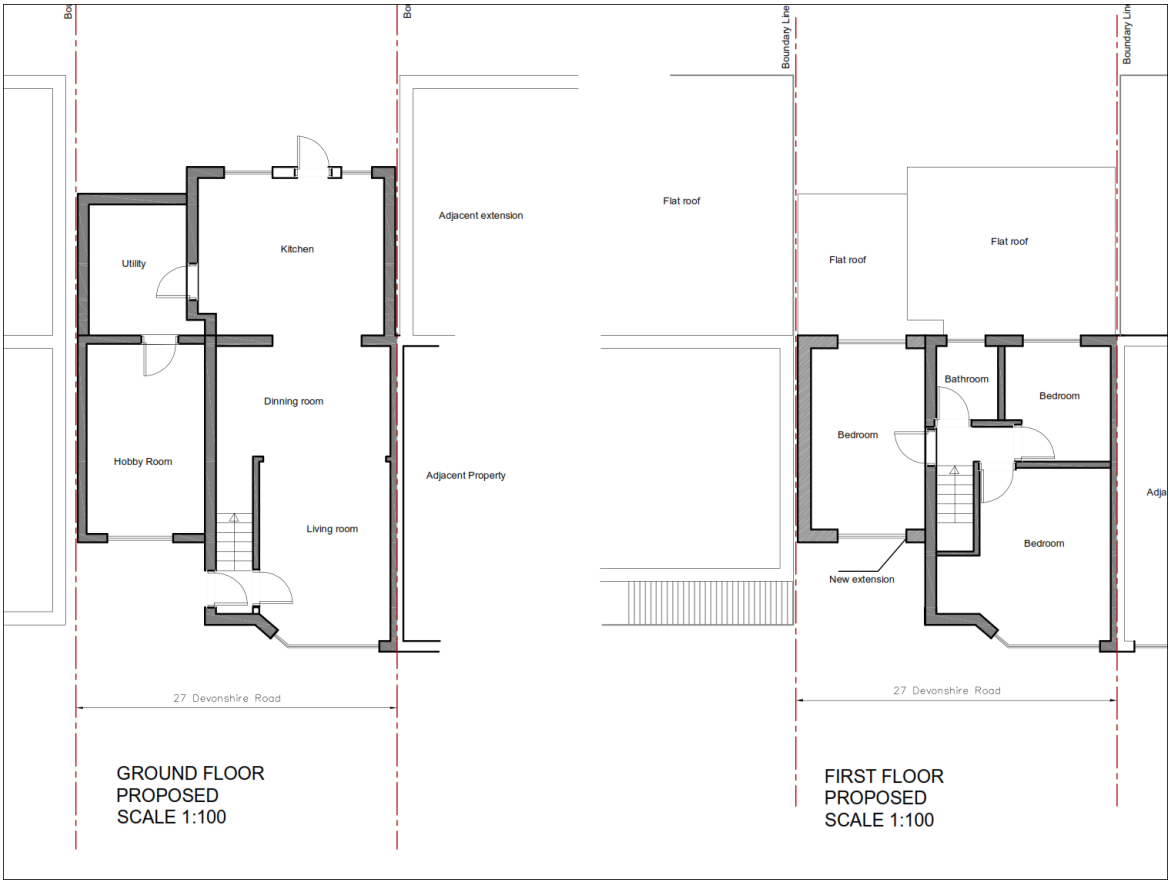


**FIGURE 2. EXISTING BUILDING & PROPOSED EXTENSION**

# Flood Risk Assessment

The National Planning Policy Framework states that minor developments such as residential extensions and conversions, are unlikely to raise significant flood risk issues. The NPPF refers applications to the Environment Agency's (EA) 'Standing Advice' for further guidance.

## Flood Risk from Watercourses

The EA's indicative floodplain map shows that the site is located in Flood Zone 2 (medium probability of flooding). Land in this flood zone is assessed as having annual probability of river flooding less than 1% and greater than 0.1%. The EA's indicative fluvial/tidal flood risk maps, Figure 3, suggest that the site is in an area which does not benefit from flood defences, however the EA's website also states that not all defences are shown on the map.

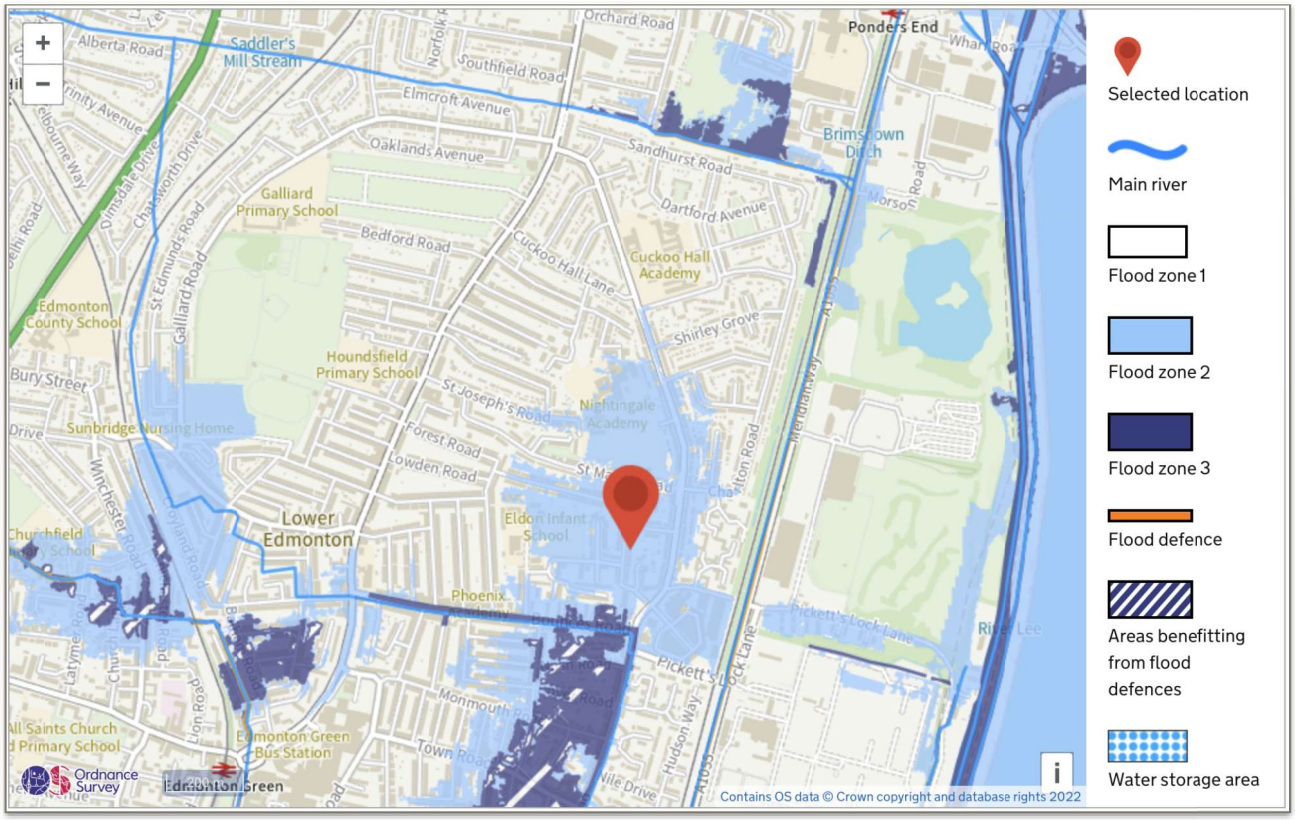


**FIGURE 3. ENVIRONMENT AGENCY FLOOD RISK FROM RIVERS OR SEA MAP (GOV.UK, 2022)**

Furthermore, it can be seen from the *Product 4 Maps* which are indicated in Figure 4, showing the site is not subject to flooding from rivers or the sea up to and including the 1 in 100 year plus climate change return period and the 1 in 200 year return period. The 1 in 1000 year return period appears to overtop the existing defences and inundate the site.

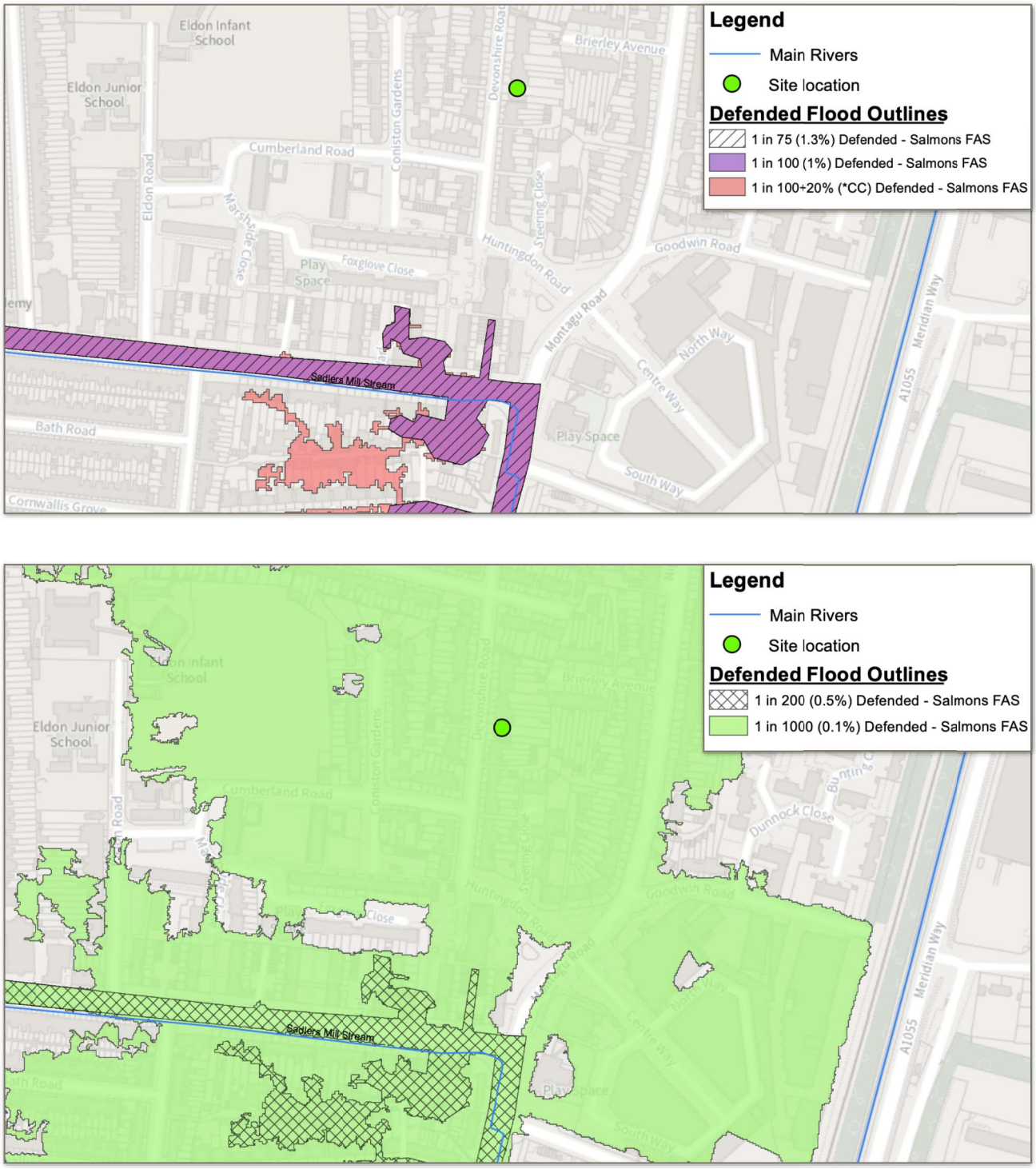


***FIGURE 4. ENVIRONMENT AGENCY DETAILED FLOOD MAP | PRODUCT 4 MAPS (EA, 2022)***

# Sequential and Exception Test

## The Sequential Test

In accordance with the NPPF, before planning permission can be granted the risk-based Sequential Test should be applied and accepted. This needs to be done for those developments in Zone 2 or 3, and for all but *minor* developments[1]. The Planning Practice Guidance (PPG) "Flood Risk & Coastal Change" states that "*The Sequential Test does not need to be applied for individual developments on sites which have been allocated in development plans through the Sequential Test, or for applications for minor development or change of use"*.

## The Exception Test

PPG goes on further to say *"the Exception Test does not need to be applied to minor developments and changes of use"*.

Therefore, the Sequential and Exception Tests do not need to be applied for this development.

[1] National Planning Policy Framework (para.164) and associated Technical Guidance (para.10)

## Flood Risk from Groundwater

Flooding from groundwater typically occurs following prolonged periods of wet weather within low laying areas underlain by permeable aquifers. When aquifers are fully saturated, flooding at surface level can occur from the sub-surface strata.

The susceptibility or vulnerability of the particular area, is highlighted on the groundwater vulnerability map (Figure 5), which indicates a *Low* risk of groundwater vulnerability in the area.

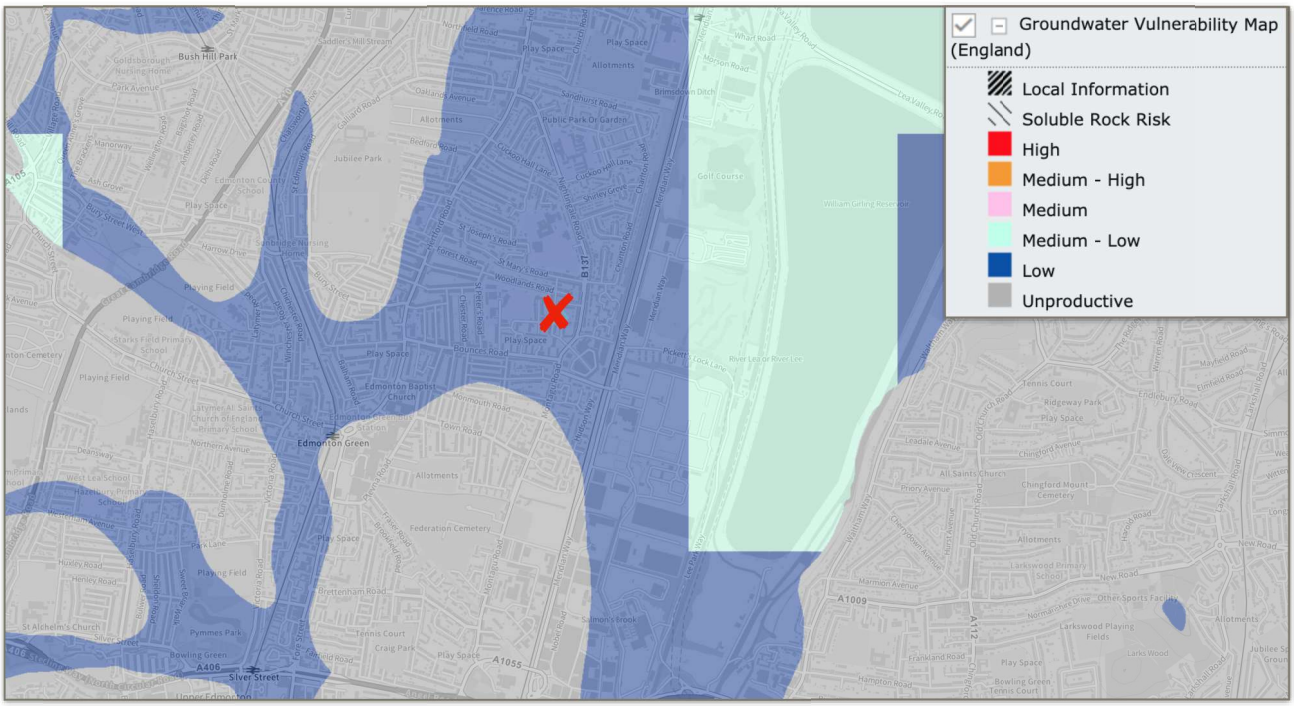


**FIGURE 5. DEFRA'S GROUNDWATER VULNERABILITY MAP (DEFRA.GOV.UK, 2022)**

Ares which are categorised as *Low vulnerability* are geological regions comprising of rocks that have low significance for water supply or baseflow to rivers, lakes and wetlands. They consist of bedrock or superficial deposits with a low permeability that naturally offer protection to any aquifers that may be present beneath; indicating a low risk of elevated groundwater in the area. Furthermore, according to the SFRA there are no recorded instances of flooding relating to groundwater in the vicinity of the proposed site.

Finally, groundwater flooding is an important consideration for subterranean basements. However, this is a small householder extension and no basements are proposed in this instance. As such it is considered that groundwater flooding does not pose significant risk to the development.

## Flood Risk from Surface Water and Overland Flows

Surface water flooding occurs when intense rainfall is unable to infiltrate into the ground or overwhelms the drainage system. This surface water runs across the surface of the ground causing flooding. The Environment Agency's Surface Water Flood Risk Map can also reflect surface water flooding along the line of small ordinary watercourses. Overland flows can also be generated by burst water mains, failed dams and any failure in a system storing or transferring water.

The EA's indicative Surface Water Flooding Map, Figure 6, shows that the site is at *Very low to Low* risk of surface water flooding.

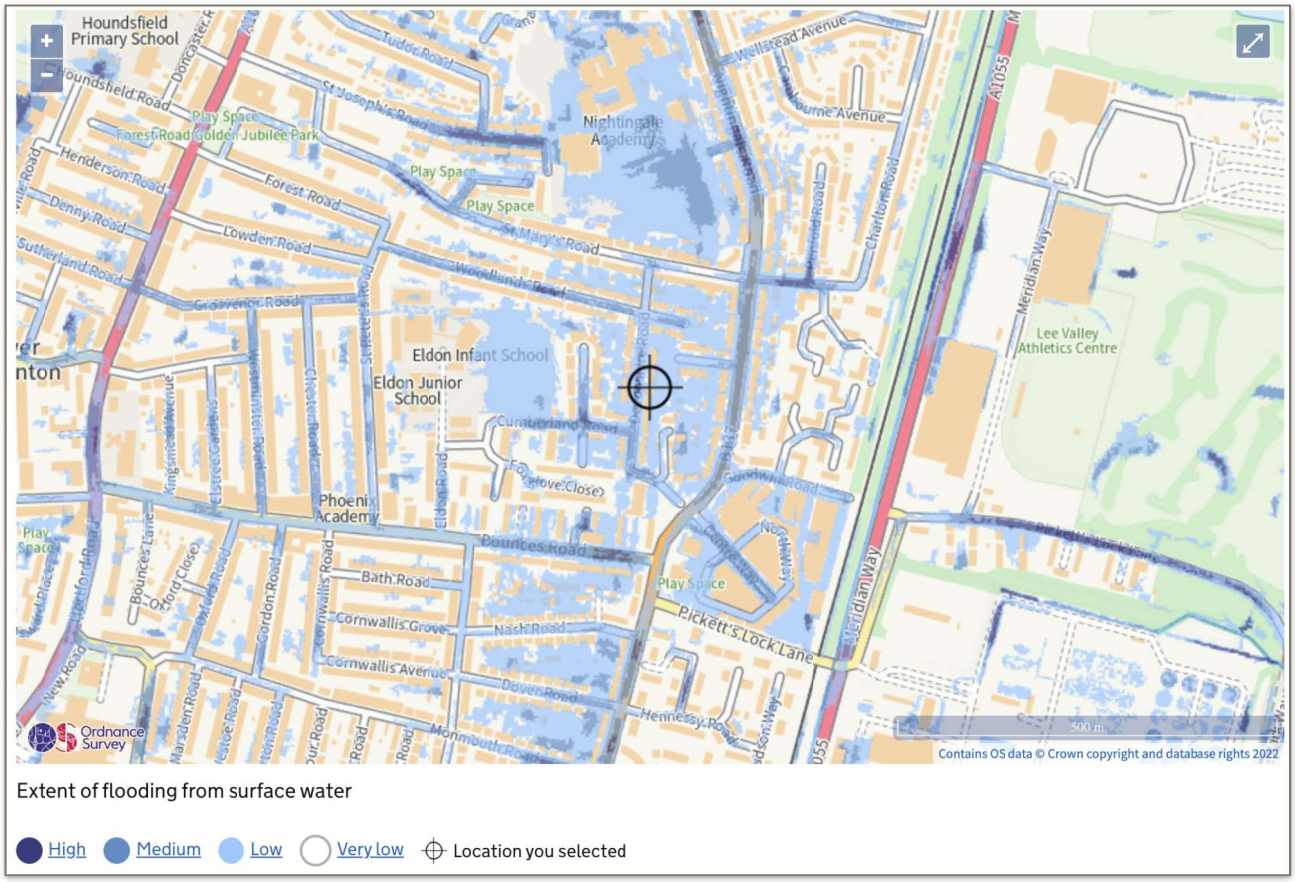


**FIGURE 6. ENVIRONMENT AGENCY FLOOD RISK FROM SURFACE WATER MAP (GOV.UK, 2022)**

These maps show the existing building appears to be at *Very Low* risk of surface water flooding (each year this area has a chance of flooding of less than 0.1%). The area where the proposed extension will be introduced is at Low risk of flooding (each year this area has a chance of flooding of between 0.1% and 1%).

Flooding from surface water is difficult to predict, or indeed model accurately, as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding. External ground levels immediately outside the building will fall away from the building thresholds, ensuring the minimisation of storm water ingress. This can be achieved by either reducing the external ground levels below internal floor levels, and/or incorporating channel drainage system along the entrance

into the building to positively drain overland flows. External ground levels should be set no lower than existing levels to ensure that the site remains above the predicted peak flood levels for all design flood events and to ensure that localised low spots that could result in surface water flooding are created. SuDS features such as permeable paving for new hard paved areas is also encouraged.

Finally, by ensuring that the internal FFL's are constructed no lower than the existing building FFL's (in accordance with EA Standing Advice), this should also reduce the associated risk from surface water flooding, as the surface water flood risk maps indicate the existing building is in an area of *Very Low* risk.

## Flood Risk from Reservoir and Infrastructure Failure

The EA's information states that reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Reservoir Act of 1975 ensures that reservoirs are inspected regularly and essential safety work is carried out.

The Environment Agency dataset 'Risk of Flooding from Reservoirs' identifies areas that could be flooded if a large reservoir were to fail and release the water it holds. The site is identified as having the potential to be inundated should a reservoir fail (Figure 7).


**FIGURE 7. ENVIRONMENT AGENCY FLOOD RISK FROM RESERVOIRS MAP (GOV.UK, 2022)**

There are seven large water supply reservoirs present within the Borough. Thames Water is responsible for the management of three of these reservoirs and ensuring all required safety standards are met.

Reservoirs in the UK have an extremely good safety record. The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected and essential safety work is carried out. These reservoirs therefore present a minimal risk.

## Flood Evacuation Plan

Although the site is categorised as having a residual risk of flooding from a overtopping in defences, the local authority have requested safe access and egress arrangements on site should overtopping of defences occur (0.1% AEP).

I. The proposed development is located within Flood Zone 2 and is at risk of fluvial flooding, however the site benefits from the presence of formal flood defences.

II. Residents/tenants responsible for the Flood Plan should be registered to EA flood alerts, as these are important to enable safe flood evacuation of the site.

III. A *safe haven* will be provided in the upper floors should overtopping of defences occur. This procedure should be explained to residents/tenants and displayed in the proposed dwelling, all common areas and adjacent to entrances to the building (if applicable).

IV. A contact list should be established by the site owner and regularly updated with changes in tenancy.

V. A flood kit must be prepared and regularly checked.

VI. It is recommended that further information is downloaded through the following link and distributed to residents of the site, and to advise residents of arrangements before a flood occurs: https://www.gov.uk/government/publications/flooding-what-to-do-before-during-and-after-a-flood

VII. If not already listed, it is recommended that the property is registered with the EA's Flood Warning Service. If you are unsure and/or you wish to register for this free service please contact Floodline Warning Service. Floodline is a free service operated by the EA that provides flood warnings direct to occupants by telephone, mobile phone etc. The EA is responsible for monitoring flood events and for issuing warnings to people in properties and businesses at risk of flooding. To fulfil their responsibilities, the EA operates a coded warning system. This is a four-stage warning system and each stage will trigger a set of procedures for the various emergency services. This warning system is outlined below.

| | | |
|---|---|---|
| **ONLINE FLOOD RISK FORECAST** | **Meaning**<br>Be aware.<br>Keep an eye on the weather situation. | **General advice**<br>• Check weather conditions.<br>• Check for updated flood forecasts on the Environment Agency website. |
|  <br>**FLOOD ALERT** | **Meaning**<br>Flooding is possible<br>Be prepared. | **General advice**<br>• Be prepared to act on your flood plan.<br>• Prepare a flood kit of essential items.<br>• Monitor local water levels and the flood forecast on our website. |
|  <br>**FLOOD WARNING** | **Meaning**<br>Flooding is expected.<br>Immediate action required. | **General advice**<br>• Move family, pets and valuables to a safe place.<br>• Turn off gas, electricity and water supplies if safe to do so.<br>• Put flood protection equipment in place. |
|  <br>**SEVERE FLOOD WARNING** | **Meaning**<br>Severe flooding.<br>Danger to life. | **General advice**<br>• Stay in a safe place with a means of escape.<br>• Be ready should you need to evacuate.<br>• Co-operate with the emergency services.<br>• Call 999 if you are in immediate danger. |
| **WARNING NO LONGER IN FORCE** | **Meaning**<br>No further flooding is currently expected in your area. | **General advice**<br>• Be careful. Flood water may still be around for several days.<br>• If you've been flooded, ring your insurance company as soon as possible. |

## Flood Mitigation Measures

The proposed building will not increase the vulnerability classification of the development, and will also not increase surface water run-off or volumes, as buildings and hard paved areas currently serve the existing site. It is proposed that the Finished Floor Level (FFL) of the ground floor extension remains the same as the existing ground floor FFLs. These proposals are in accordance with the EA's Standing Advice[2], which states that floor levels within the proposed development should be set no lower than existing levels, and flood proofing should be incorporated in order to protect the extension from flooding.

It is proposed flood resilient[3] materials will be used for flooring and on the walls up to minimise the potential for damage, in the event flood water impacts the proposed ground floor. Furthermore, the EA notes that a replacement floor constructed to a high standard with reinforced concrete and with a continuous damp proof membrane can be an effective solution where groundwater pressures are low.[4]

Finally, all drainage systems should be routinely maintained to reduce the risk of blockage and surface water flood risk. It is also recommended that channel drainage is introduced immediately outside of the proposed building threshold as this would assist in alleviating ponding issues.

If not already listed, it is recommended that the property is registered with the EA's Flood Warning Service. If you are unsure and/or you wish to register for this free service please contact Floodline Warning Service[5]. Floodline is a free service operated by the EA that provides flood warnings direct to occupants by telephone, mobile phone etc.

[2] https://www.gov.uk/guidance/flood-risk-assessment-standing-advice

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7730/flood_performance.pdf

[4] 'Flooding from groundwater: Practical advice to help you reduce the impact of flooding from groundwater' - *Environment Agency*

[5] www.environmentagency.gov.uk/floodline

## Conclusions

The NPPF states that minor developments such as residential extensions are unlikely to raise significant flood risk issues. The FRA has further demonstrated that the proposed extension has an acceptable flood risk within the terms and requirements of NPPF and accompanying technical guidance.

The proposed building extension will not increase the impermeable areas on the site, as the external area is currently positively drained hardstanding/roof areas. It will therefore not increase the flood risk from surface water, as there will be no increase in the surface water run-off rate or volumes.

If not already listed, it is recommended that the property is registered with the EA's Flood Warning Service.

**Note:**

This report has been prepared for the purposes of submitting for planning to the local planning authority for review in relation to the associated flood risk for the proposed development, and uses the most up-to-date information available to us at the time. It should not be relied upon by anyone else or used for any other purpose. This report is confidential to our Client; it should only be shown to others with their permission. We retain copyright of this report which should only be reproduced with our permission.

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