

Flood Risk Assessment

To accompany a planning application for a first
floor extension to

Waters Edge, Loddon Drive,
Wargrave, Berks, RG10 8HL

Prepared by

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1 Executive Summary

- A The extension is to create an upper floor to an existing single storey dwelling within an existing developed site and this is minor development;
- B The site lays in Flood Zones 3b, 3a and 2;
- C The site as a whole is at a Low risk from groundwater and reservoir flooding;
- D The additional floor's level is to be set at least 2.5 m above estimated flood levels;
- E There are no identified flood risks the the upper floor;
- F Flood resilience and mitigation methods are not required at first floor level;
- G The proposal for an upper floor provides an immediate and significant betterment over the existing provision offering both safe refuge and elevated sleeping accommodation;
- H Existing access/egress routes, although not ideal, are not affected and the site will be signed up to flood warning schemes;
- I There is no documented evidence of flood risk from any other sources;
- J The development does not impact on flood risk elsewhere;
- K Assuming the recommended warning and evacuation procedures can be maintained over the lifetime of the development, the proposed minor development to form an upper floor to an existing single storey dwelling is considered acceptable.

Client actions required

- I Sign up to flood warning schemes.
- II Complete an emergency flood plan.

2 Introduction

2.1 Site location

The project is at Waters Edge, Loddon Drive, Wargrave Berkshire RG10 8HL (see Figure 1).



Figure 1: Site location plan, as indicated with North topmost.

2.2 Development description

The proposal is for a domestic first floor extension not exceeding 250m² in footprint. The site is an existing developed site and the proposed work is classed as minor development.

The existing and proposed layouts and proposed sections are to be submitted under separate cover.

2.3 Site geology

Geological mapping data from within the vicinity indicate Alluvium-Clay, silt, sand and gravel. however this would require confirmation on site. If available on site, the superficial deposits will offer medium to poor permeability. Infiltration SuDS therefore may be viable (subject to site testing and ground water levels).

3 Policies

In preparation for this Flood Risk Assessment (FRA), National Planning Policy Framework^[3] and British Standards on Assessing and Managing Flood Risk^[2] were reviewed, and

their related policies are, where applicable, referred to in this report.

The Environment Agency has been consulted in order to establish the flood zone of the proposed site.

In addition, planning policies from the Local Authority were also reviewed including its Strategic Flood Risk Assessment.

Some of key policies are summarised as below.

3.1 Proximity of development to main rivers

The proposed development is greater than 20m (it is 53m) from a Main River hence the EA are not Statute consultees and EA standing advice applies.

3.2 Standing Advice

Generally the following applies: Apart from habitable basements, domestic extensions within the curtilage of the dwelling (see GDPO definition of, minor development) and non-domestic extensions with a footprint of less than 250 m² will not require a detailed FRA. These applications should demonstrate that the risk of flooding from all sources has been assessed.

3.3 Environment Agency Guidance on Standing Advice

The FRA should be:

- appropriate to the scale, nature and location of the development;
- proportionate to the degree of flood risk.

For all development covered by standing advice, a FRA should include:

- the site address;
- a description of the development;
- the estimated flood level for your development, taking into account the impacts of climate change over its lifetime;
- details of the finished floor levels;
- details of your flood resistance and resilience plans;
- any supporting plans and drawings any other information.

Floor levels

- floor levels are set at least 600 millimetres (mm) above the estimated flood level. You may be able to reduce this to 300mm if there is a high level of certainty about your estimated flood level. If there is a particularly high level of uncertainty it may need to be increased;
- if floor levels cannot be raised in this way, you will also need to include extra flood resistance and resilience measures. These measures should protect the property to at least 600mm above the estimated flood level.

The building design should also:

- prioritise excluding flood water where possible;
- speed recovery in case water gets in.

4 Flood risk analysis

4.1 Sources of potential flooding

Flood risk from various sources at the site is analysed in this section.

4.1.1 Flood risk from sea and rivers

Flooding can occur from the sea due to a particularly high tide or surge, or combination of both.

The site is not at risk from tidal flooding.

Flooding can also take place from flows that are not contained within a river channel due to high levels of rainfall in the catchment.

With reference to the Environment Agency flood map, Figure 2, the site lays within Flood Zones 3b, 3a and 2 (in risk order). This means that the site has a Very High probability of fluvial flooding (greater than a 1 in 30yr annual probability of fluvial flooding).

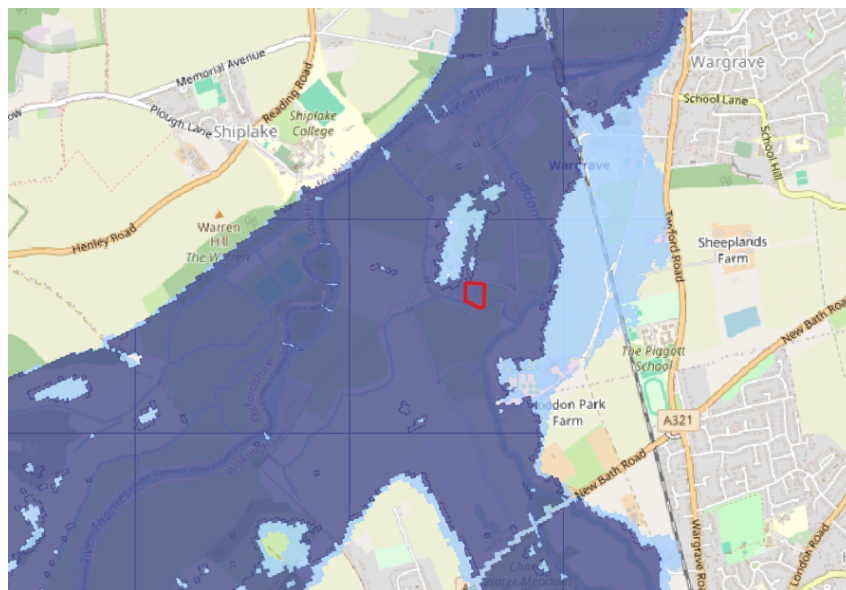


Figure 2: Flood mapping from the EA online data. The site falls within Flood Zones 3 & 2

Historic flooding

With reference to the EA historic flood mapping as extract at Figure 3, the site is shown to lay in an area of historic flooding.

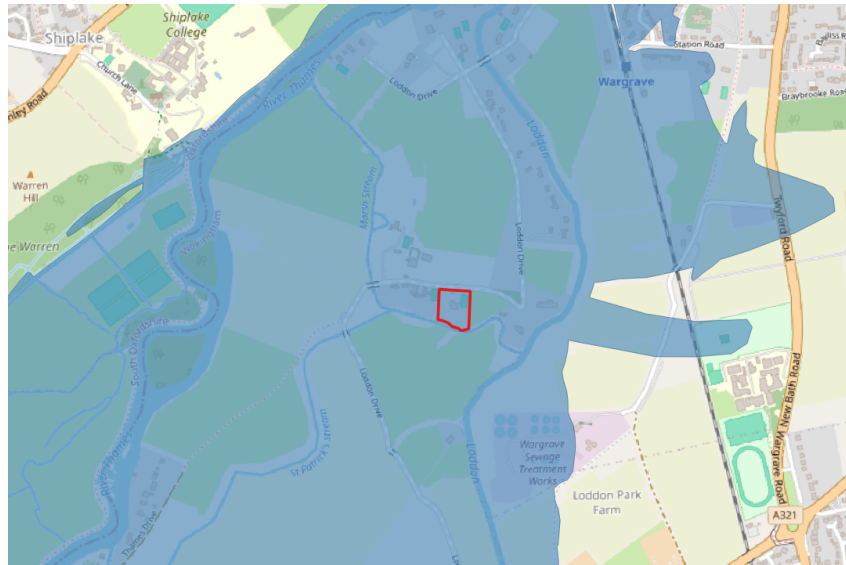


Figure 3: Historic flood mapping from the EA online data. The site falls within part an area of historic flooding

4.1.2 Flood risk from groundwater

Groundwater flooding occurs when water levels in the ground rise above surface levels. It is most common in low-lying areas underlain by permeable rock (aquifers), usually due to extended periods of wet weather. The site's geology is classified as having Very High susceptibility to groundwater flooding ($\geq 75\%$).

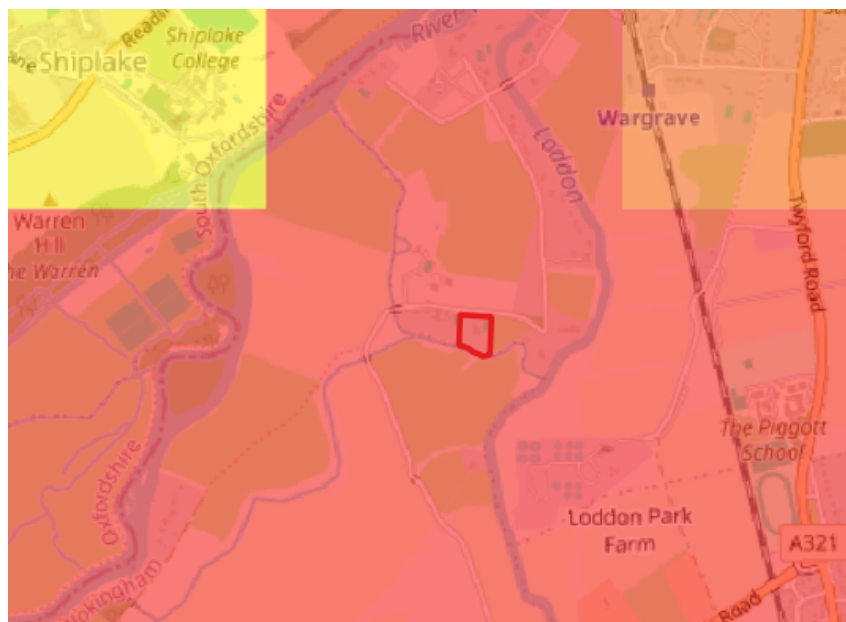


Figure 4: Susceptibility to ground water flooding. The site falls within an area at Very High, $\geq 75\%$ risk

Since the proposed development does not involve any basement elements, the impact of groundwater flooding on the proposed site will be minimal. Hence, the relative risk of groundwater flooding on the proposed site can be considered to be Low.

4.1.3 Flood risk from sewer and highway drains

Flooding occurs when combined, foul or surface water sewers and highway drains are temporarily over-loaded due to excessive rainfall or due to blockage.

There are no indicators to Sewer flooding at the site.

Hence, the risk of sewer and highway flooding to the proposed site can be considered to be Low.

4.1.4 Flooding risk from surface water

Flooding occurs when rainfall fall on a surface (on or off the site) which acts as run-off which has not infiltrated into the ground or entered into a drainage system.

Present day risk With reference to the 25.03.2025 release of the Flood Map for Planning data set, Figure 5, the dwelling is at a very Low risk from surface water flooding.



Figure 5: SW flood risk mapping of current risk. The site is not shown to be at risk.

Future risk With reference to the 17.09.2025 release of the E.A online SW data set, Figure 6, the dwelling will remain at a very Low risk (less than 1 in 1000yr) from surface water flooding.

For the design period, 1 in 100yr+ CC, there is a Nil probability of occurrence for any depth of surface water flooding at the site as shown in Table 1).



Figure 6: SW flood risk mapping including climate change. The site is in an area at Low, 1 in 1000yr, future risk

Depth	Probability of occurrence
0 - 0.2m	Nil
0.2 - 0.3m	Nil
0.3 - 0.6m	Nil
0.6 - 0.9m	Nil
0.9 - 1.2m	Nil

Table 1: Design period, 1 in 100yr + CC SW flood depth and highest related probability of occurrence at the extension

4.1.5 Flood risk from infrastructure failure

Flooding occurs because of canals, reservoirs, industrial processes, burst water mains or failed pumping stations.

The site is shown to be at flood risk due to reservoir failure in the event that it was to coincide with a fluvial flood event, as indicated by the lighter shaded areas in Figure 7.



Figure 7: Flood risk from reservoir flooding. The site is shown to be in an area at risk. (Source: EA flood mapping)

However the EA have previously stated that:

“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, we ensure that reservoirs are inspected regularly and essential safety work is carried out.”

Hence the flood risk to the site from reservoir failure is considered to be Low.

4.1.6 Urban flash flooding

With reference to the UFF dataset there are no referenced flash flood incidents at this location.

4.2 EA summary of flood risk

Figure 8 gives the EA’s overall summary of flood risk to the site.

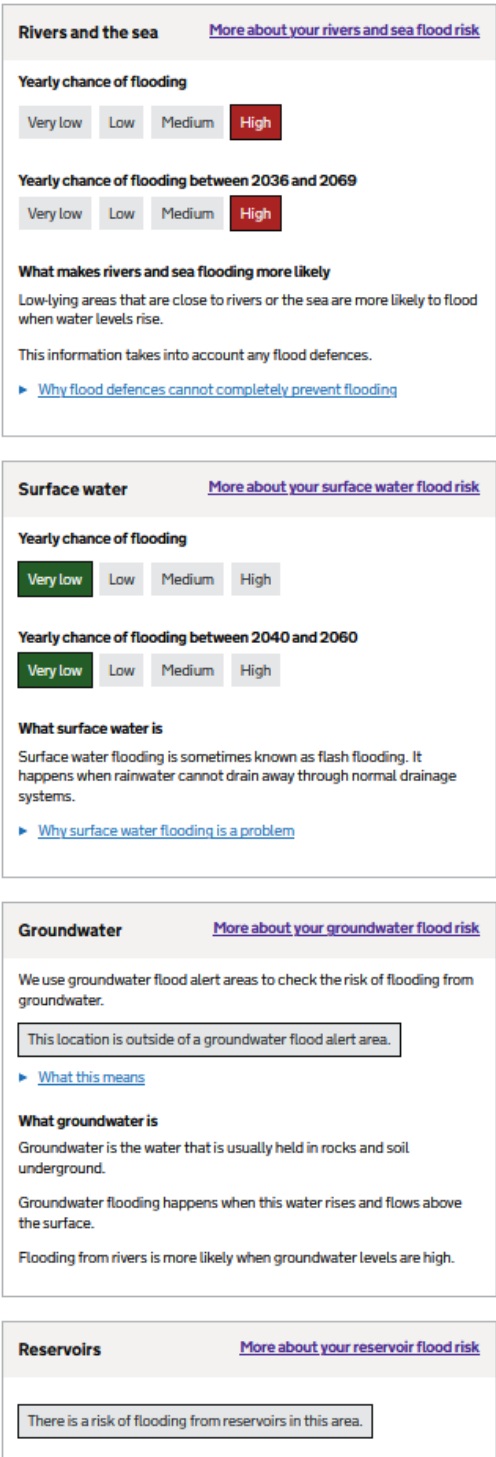


Figure 8: EA summary of flood risk to the site

4.3 On-site surface water analysis and management

4.3.1 Generation of Run-off

Given the footprint of the dwelling is not being increased the post-development surface water run-off volume will not increase when compared to the pre-development level because there is no overall reduction in permeable areas.

4.4 Loss of flood plain capacity

Because the first floor extension does not increase the plan area footprint of the dwelling there is no resulting loss in flood plain capacity.

4.5 Impact on flood risk elsewhere

Since the proposal will not increase run-off volumes nor displace flood water the impact on flood risk elsewhere is negligible.

4.6 Land Drainage Act and Local Bylaws

4.6.1 Collection and discharge of surface water to watercourse

The site's owner benefits from Riparian Rights to the natural water courses that cross the site.

This is the natural right of the proprietor of land to:

“collect and discharge the surface water runoff from their land onto an adjoining land owner, even where they have created an increase in flow by an improved system of drainage or by other means”^[1] (Case law: Durrant v Branksome U.D.C 1897).

This Common Law and natural Right does not however permit the owner to act in a “wilful manner”.

The applicant does not therefore intend to act in a “wilful manner” and hence will manage any additional run-off in line with current best practice where at all practicable to do so.

Such Rights do however come with associated Duties.

4.6.2 Riparian duties

Landowners have the primary responsibility for safeguarding their land and other property against flooding. Riparian owners have the responsibility of maintenance

of the watercourse which bound their property. Individual property owners and users are also responsible for managing the drainage of their land so that they do not adversely impact neighbouring land.

4.6.3 Land drainage consent

Land Drainage Act or Bylaw Consent may be required to carry out any work on or adjacent to, and for any discharge into, any watercourse on the development site. Such consent does not however remove any natural Rights or Duties.

5 Levels

5.1 Climate change allowances

The revised climate change allowance for the site is +14% as shown in Figure 9.

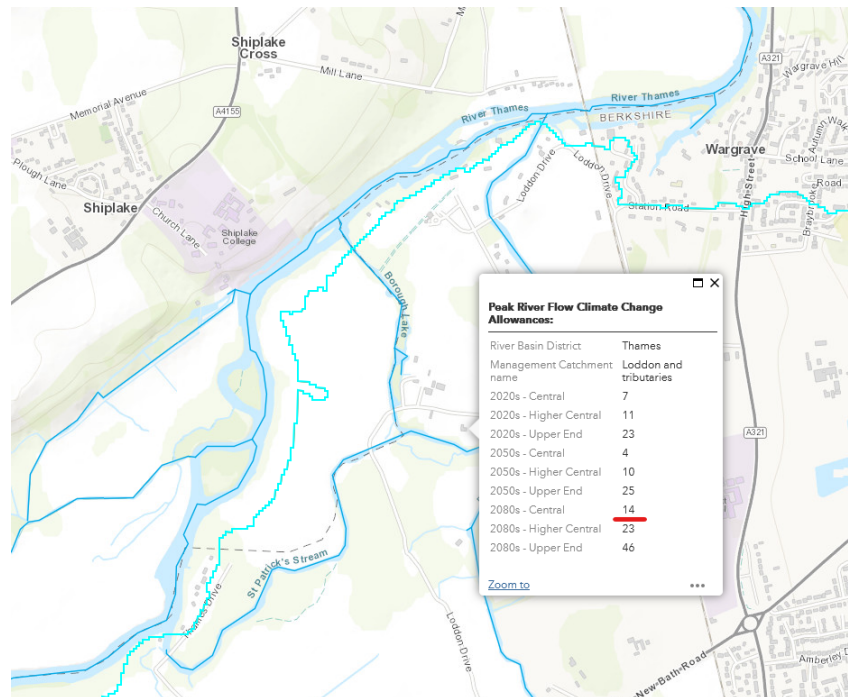


Figure 9: Revised climate change allowances

5.2 Flood level data

The flood data is extracted from the River Thames data as provided under a “Product 6” FOI request to the EA hence there is a high degree of certainty with this data.

The data does not provide +14% CC hence the data for +25% is used here in a conservative manner.

Figures 10 provides 1 in 100yr+ 25% CC flood levels and Figure 11 provides the related flood depths.

The design flood level at the dwelling is 34.62m AOD.



Figure 10: 1 in 100yr +35% CC flood levels, m AOD.



Figure 11: 1 in 100yr + 25% CC flood depths, m.

5.3 External ground level

Base on a flood level at the front entrance of 34.62m AOD resulting in a flood depth of 1.21m the ground level is calculated as $34.62 - 1.21 = 33.41\text{m AOD}$.

5.4 Existing floor level

The existing ground floor level is shown on Sectional plans to be 1.1m above external ground level at the front entrance hence at 34.51m AOD.

5.4.1 Existing flood depth in dwelling

Given the predicted flood depth to the front of the property is 1.21m the current predicted internal flood depth is 110mm for design period events.

5.5 Extension's floor level

In line with EA standing advice the FFL of the first floor extension should be set no lower than $34.62 + 0.3 = 34.92\text{m AOD}$.

Given the extension is vertical commencing at circa 2.6m above the ground floor level then the minimum is readily met.

5.5.1 Freeboard

Required = 300mm

Provided > 2.5m hence satisfactory.

5.6 Safe refuge

The proposed upper floor on what is currently a single storey bungalow will provide a significant betterment over the existing provision offering both safe refuge and elevated sleeping accommodation.

“Flood Warnings Direct” which is a free service providing flood warnings by phone, text or email. See <https://www.fws.environment-agency.gov.uk/app/olr/register>, or call the E.A. on 0345 988 1188 for full information.

6.5 Flood Plan

This report also provides the owners of the dwelling with a proforma Flood Plan (See Appendix A for an example). The plan will, when completed bespoke to the owners and property, provide guidance on emergency response procedures in the event of flooding to the site. This will:

- Provide details of who to contact and how;
- Provide details of how to turn off gas, electricity and water mains supplies;
- Provide details of designated safe egress routes out of the building and out of the local area at risk;
- Provide details of E.A. Flood warning codes;
- Provide details of local radio stations
- Provide a check list of essential items.

7 Conclusions

Given that:

- The extension is to create an upper floor to an existing single storey dwelling within an existing developed site and this is minor development;
- The site lays in Flood Zones 3b, 3a and 2;
- The site as a whole is at a Low risk from groundwater and reservoir flooding;
- The additional floor's level is to be set at least 2.5 m above estimated flood levels;
- There are no identified flood risks the the upper floor;
- Flood resilience and mitigation methods are not required at first floor level;
- The proposal for an upper floor provides an immediate and significant betterment over the existing provision offering both safe refuge and elevated sleeping accommodation;
- Existing access/egress routes, although not ideal, are not affected and the site will be signed up to flood warning schemes;
- There is no documented evidence of flood risk from any other sources;
- The development does not impact on flood risk elsewhere;

and assuming the recommended warning and evacuation procedures can be maintained over the lifetime of the development, the proposed minor development to form an upper floor to an existing single storey dwelling is considered acceptable.

Signed: 

Dr Robin Saunders CEng, C. Build E, MCABE, BEng(Hons), PhD

Date: 18th December, 2025

References

- [1] Anon. Land drainage and flood deence responsibilities. Technical report, Institution of Civil Engineers, 2016.
- [2] BSI. BS 8533:2011. Technical report, 2011.

- [3] Ministry of Housing, Communities and Local Government. National planning policy framework. 2021.

A Emergency flood plan (example)

Personal flood plan

Name

Environment
Agency

Are you signed up to receive flood warnings?
If not call Floodline on 0345 988 1188 to see if your area receives free flood warnings.

☐

Let us know when you've completed your flood plan by calling Floodline on **0345 988 1188**.
This will help us learn more about how people are preparing for flooding.

General contact list	Company name	Contact name	Telephone
Floodline	Environment Agency		0345 988 1188
Electricity provider			
Gas provider			
Water company			
Telephone provider			
Insurance company and policy number			
Local council			
Local radio station			
Travel/weather info			

Key locations

Service cut-off	Description of location
Electricity	
Gas	
Water	

Who can help/who can you help?

Relationship	Name	Contact details	How can they/you help?
Relative			
Friend or neighbour			

Be prepared for flooding. Act now

Personal flood plan

What can I do NOW?

☐ Put important documents out of flood risk and protect in polythene

☐ Look at the best way of stopping floodwater entering your property

☐ Make a flood plan and prepare a flood kit

☐ Check your insurance covers you for flooding

☐ Find out where you can get sandbags

☐ Identify what you would need to take with you if you had to leave your home

☐ Understand the flood warning codes

☐ Identify who can help you/who you can help



What can you do if a flood is expected in your area?

Actions	Location
Home - Move furniture and electrical items to safety - Put flood boards, polythene and sandbags in place - Make a list now of what you can move away from the risk - Turn off electricity, water and gas supplies - Roll up carpets and rugs - Unless you have time to remove them hang curtains over rods - Move sentimental items to safety - Put important documents in polythene bags and move to safety	
Garden and outside - Move your car out of the flood risk area - Move any large or loose items or weigh them down	
Business - Move important documents, computers and stock - Alert staff and request their help - Farmers move animals and livestock to safety	
Evacuation - Prepare a flood kit in advance - Inform your family or friends that you may need to leave your home - Get your flood kit together and include a torch, warm and waterproof clothing, water, food, medication, toys for children and pets, rubber gloves and wellingtons	

There are a range of flood protection products on the market to help you protect your property from flood damage. A directory of these is available from the **National Flood Forum** at www.bluepages.org.uk

Be prepared for flooding. Act now

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