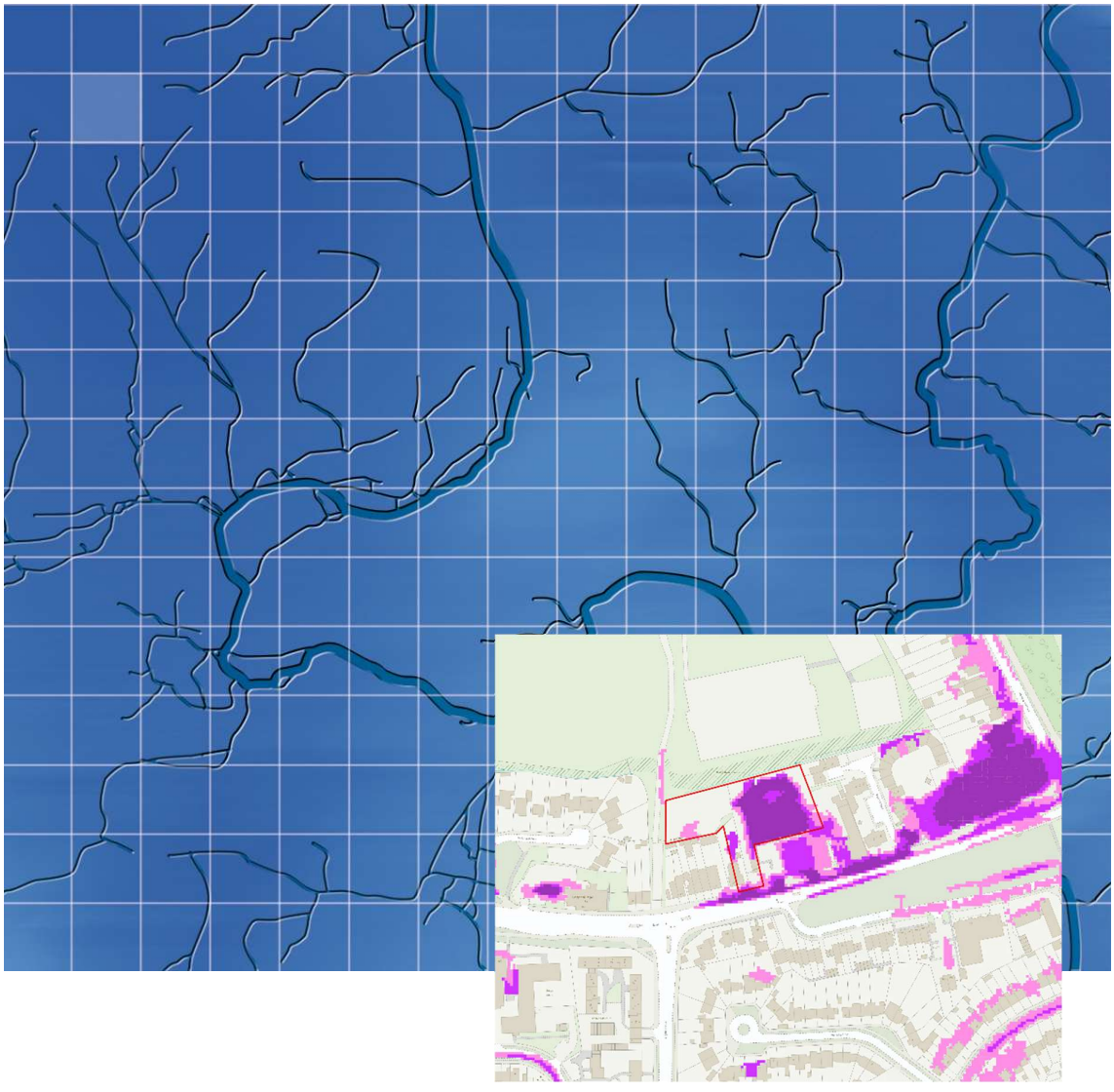
Reading Borough Council

May 2025

Land at 132-134 Bath Road (WR3u)

Level 2 Strategic Flood Risk Assessment



Reading Borough Council

Land at 132-134 Bath Road (WR3u) Level 2 Strategic Flood Risk Assessment

Document issue details

WHS10135

Version	Issue date	Issue status	Prepared By	Approved By
1.0	13/05/2025	Draft	Joseph Bentley (*Consultant*)	Paul Blackman (*Director*)

For and on behalf of Wallingford HydroSolutions Ltd.

The WHS Quality & Environmental Management system is certified as meeting the requirements of ISO 9001:2015 and ISO 14001:2015 providing environmental consultancy (including monitoring and surveying), the development of hydrological software and associated training.

Registered Office Maclean Building, Benson Lane, Wallingford OX10 8BB
www.hydrosolutions.co.uk

Land at 132-134 Bath Road (WR3u) Level 2 SFRA
Flood Risk Overview

Fluvial Flood Risk	**L**
Pluvial Flood Risk	**H**
Other Sources of Flood Risk	**L**
Confidence in Assessment	**M**

Flood Risk

Surface water flood risk represents the greatest risk at the site, with 46% of the site inundated by the design 1.0% AEP plus Climate Change event. It is considered high risk at this stage, however there is some uncertainty in its accuracy in the national scale mapping.

The entire site is in Flood Zone 1 and therefore the fluvial flood risk is considered to be low. The risk from other sources is also low.

The overall confidence in the assessment is moderate because national scale mapping was used to assess surface water flood risk.

Conclusions and Recommendations

The proposed development will consist of housing which is considered a *More Vulnerable* Development. *More Vulnerable* infrastructure is permissible in Flood Zone 2 but must pass an Exception Test if located in Flood Zone 3a, as specified in the latest NPPF. *More Vulnerable* infrastructure is not permissible in Flood Zone 3b. The entire site boundary is in Flood Zone 1, therefore fluvial flooding does not present a barrier to development at this site.

Pluvial flooding is significant at the site covering a large proportion of the site (46%) in the design 1.0% AEP plus climate change event. The analysis presented herein is based on national scale mapping, it is recommended it is assessed in more detail as part of a site-specific FRA with potential development of a bespoke hydraulic model to better inform flood risk.

Contents

1 Introduction

1.1 Background

Wallingford HydroSolutions Ltd has been commissioned by Reading Borough Council (RBC) to undertake a Level 2 Strategic Flood Risk Assessment (SFRA) at the land at 132-134 Bath Road (WR3u) site in accordance with the National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG) and associated guidance from the Environment Agency (EA).

Where there is a risk of flooding at the site, this risk has been quantified with the latest available datasets and any associated limitations with the assessment have been identified.

Where applicable, recommendations for improving our understanding of flood risk and/or mitigating the risk have also been included in this report.

1.2 Assessment of Flood Risk

For the site, a detailed assessment of the nature of flood hazard was undertaken. This included using the relevant fluvial modelling data to assess:

- The proportion of the site inundated for a range of return periods
- The speed of onset
- Flood depth
- Flood velocity
- Flood Hazard

The sites were assessed against a range of return periods, however the design event, the 100-year (plus central climate change) event, is the most important for planning purposes.

In addition to the analysis of modelling data, the location, standard and condition of existing flood defences was assessed. Other sources of flooding were also reviewed at each site. This included an assessment of surface water flooding and an assessment of groundwater flooding based on available hydrogeological information from BGS and Soilscapes. Potential access/egress routes were identified with respect to the risk posed from all sources of flooding.

Following a review of flood risk, flood defences and the identification of access/egress routes, an assessment was made on whether a future site-specific FRA would be able to show that the site can be allocated for development. The assessment takes into account the flood risk vulnerability of the development, the scale of development proposed along with any requirements for the Exception Test. In this context, any mitigative actions in the form of ground raising and compensatory storage are identified.

The site assessments also include guidance for the preparation of FRAs, including information about the use of SuDS.

1.3 Report Structure

This FRA follows the structure summarised below:

1 - Introduction (this section)

2 - Site Description

3 - Flood Risk

4 – Detailed Review of Primary Flood Risk

5 – Development Viability and FRA Recommendations

2 Site Description

2.1 General Location Plan

The Land at 132-134 Bath Road (WR3u) site is 0.51ha in area and is located directly south of the Kings Academy Prospect secondary school in south Reading. The land is currently occupied by a business park. The surrounding land use is suburban, see Figure 1.

In the Replacement Local Development Plan (RLDP) the site is proposed to be used for residential development. Between 17-25 dwellings are proposed at the site.

2.2 Topography

Based on 1m LiDAR data, within the site boundary the ground slopes from the north west to southeast, see Figure 2. This follows the fall of surrounding land. The ground levels within the site boundary range from 54.1 to 56.3m AOD. The average ground level is 54.5m AOD.

2.3 Nearby Watercourses

The nearest watercourse is the Holy Brook, a tributary of the River Kennet, which is located approximately 750m south of the site boundary. It runs from east to west at this location. Figure 1 shows the location of the nearest watercourse.

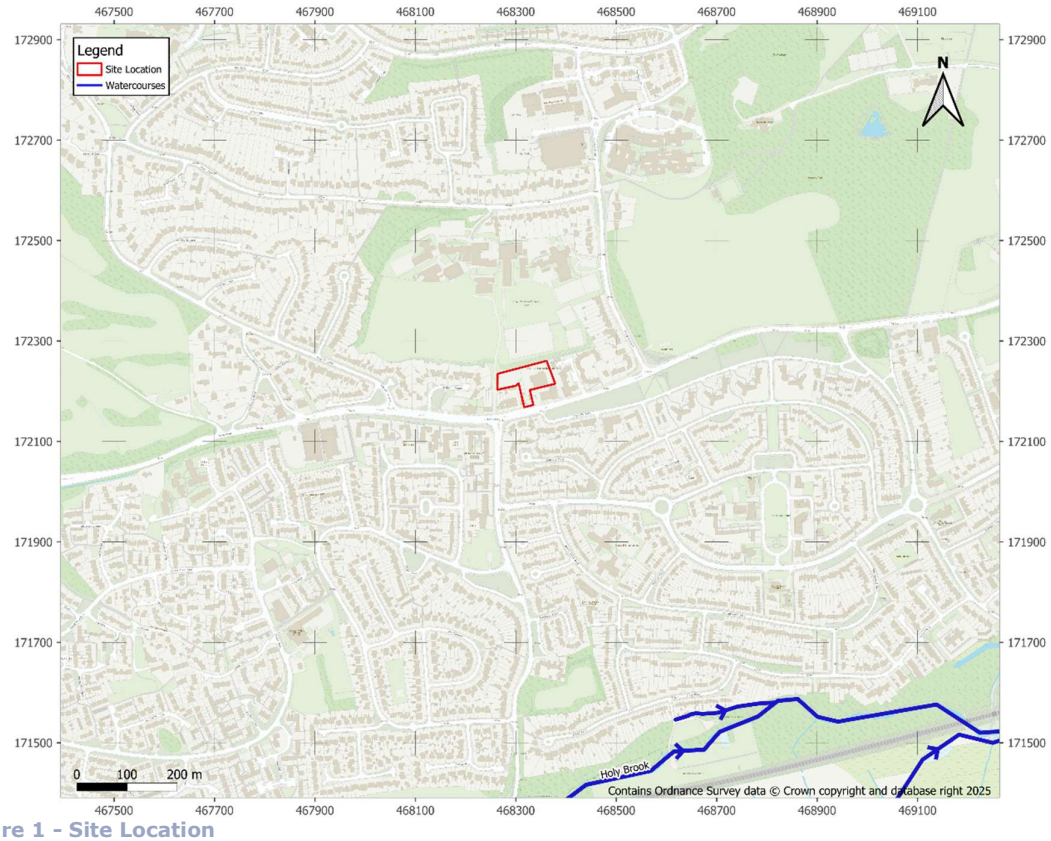


Figure 1 - Site Location

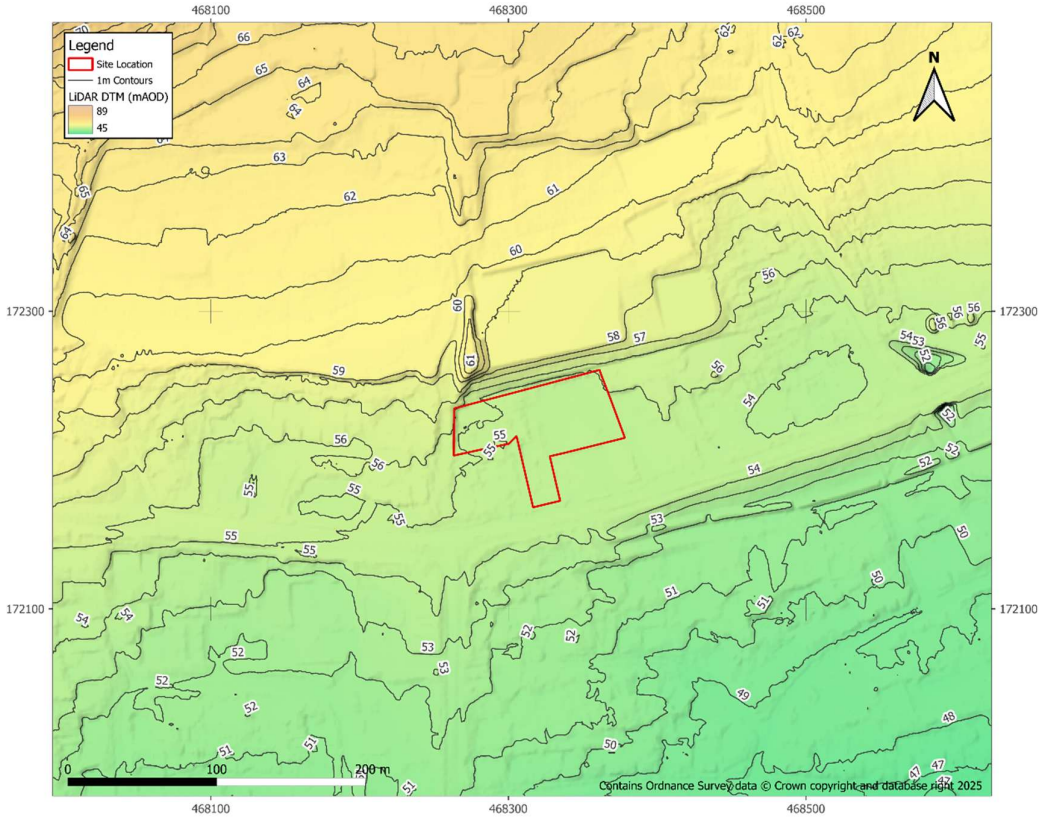


Figure 2 - Topography

3 Flood Risk

3.1 Historical Flooding

The EA has no records of historic flooding at the site. The nearest recorded historic flood extent occurred in June 1971, associated with the Holy Brook, flood extents from this event are located 730m south of the site boundary.

3.2 Fluvial Flood Risk

In the existing Flood Map for Planning (FMfP), the entire site is situated within Flood Zone 1, see Figure 3. These proportions are based on the latest national scale modelling, rather than the River Kennet (Tyle Mill to Thames Confluence) (2018) model, which informed the previous iteration of the FMfP and the level 1 SFRA for Reading Borough completed in November 2024. Viewing the 2018 model results these show similar extents for Flood Zone 2 and 3, with the site exclusively in Flood Zone 1.

The EA climate change fluvial outputs for Flood Zones 2 and 3 have also been assessed. The entire site remains in Flood Zone 1 for these events, see Figure 4. The 2018 model results show the similar extents. Fluvial flood risk is considered to be low.

3.3 Flood Defence Infrastructure

There is no formal flood defence infrastructure in the vicinity of the site. The site is also not located in an area associated with a reduction in risk of flooding from rivers and sea due to defences nor is it located within a flood storage area.

3.4 Surface Water Flood Risk

The EA's surface water flood maps show inundation in the lowest part of the site, to the east. In total, 33% of the site is inundated in the 3.3% AEP event, 42% is inundated in the 1.0% AEP event and 53% is inundated in the 0.1% AEP event, see Figure 5. When accounting for climate change, the proportions increase to 40% in the 3.3% AEP event, 46% in the 1.0% AEP event and 57% in the 0.1% AEP, see Figure 6.

Overall surface water flood risk is considered to be high, however whilst the flood extents are significant, there is some uncertainty in their accuracy (see section 4).

3.5 Groundwater Flooding

The site is underlain by the Lambeth Group which comprises Clay, Silt and Sand bedrock. This is expected to permit variable amounts of infiltration. No superficial deposits are present at the site. The soils are slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, which are expected to have impeded drainage.

The impeded drainage of the soils and variable drainage of the bedrock will likely mean that the water table is immobile, therefore groundwater flood risk is estimated to be low. However, more data is required at the planning stage to confirm the ground permeability and groundwater flood risk.

3.6 Reservoir Flood Risk

The FMfP shows that the site is not at risk from reservoir flooding, see Figure 7.

3.7 Flood Warning Service

The site is not located within a flood warning area.

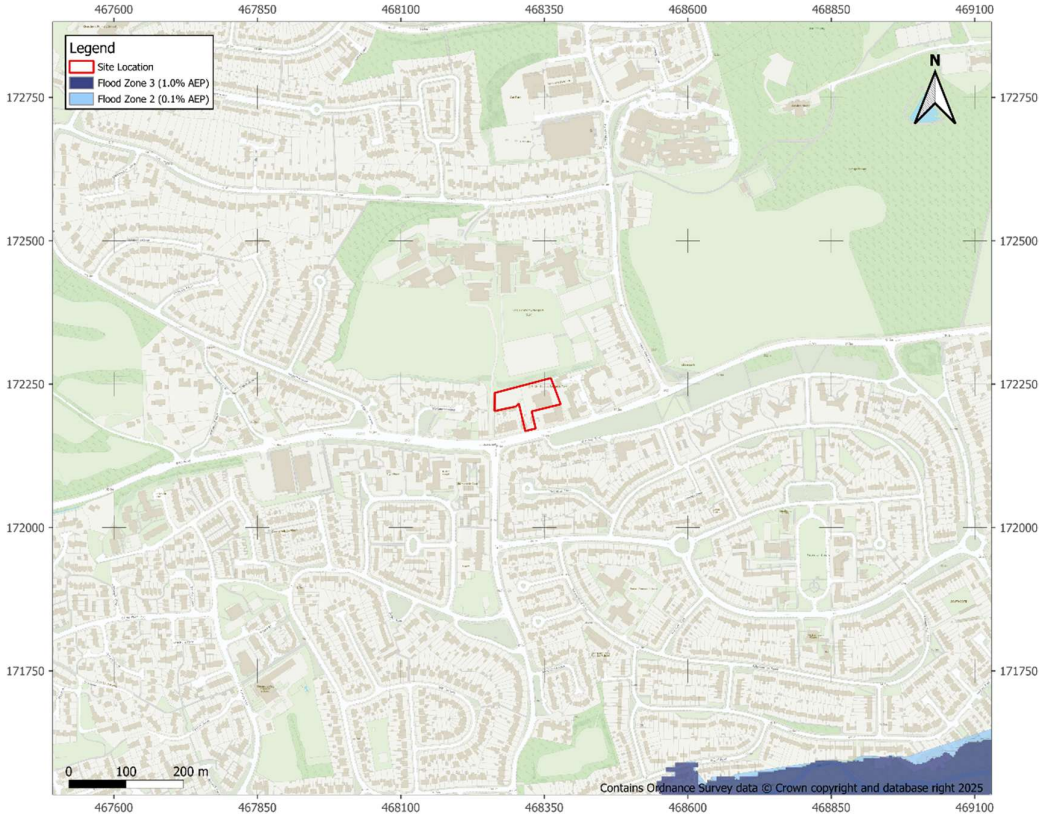


Figure 3 - Fluvial Flood Map

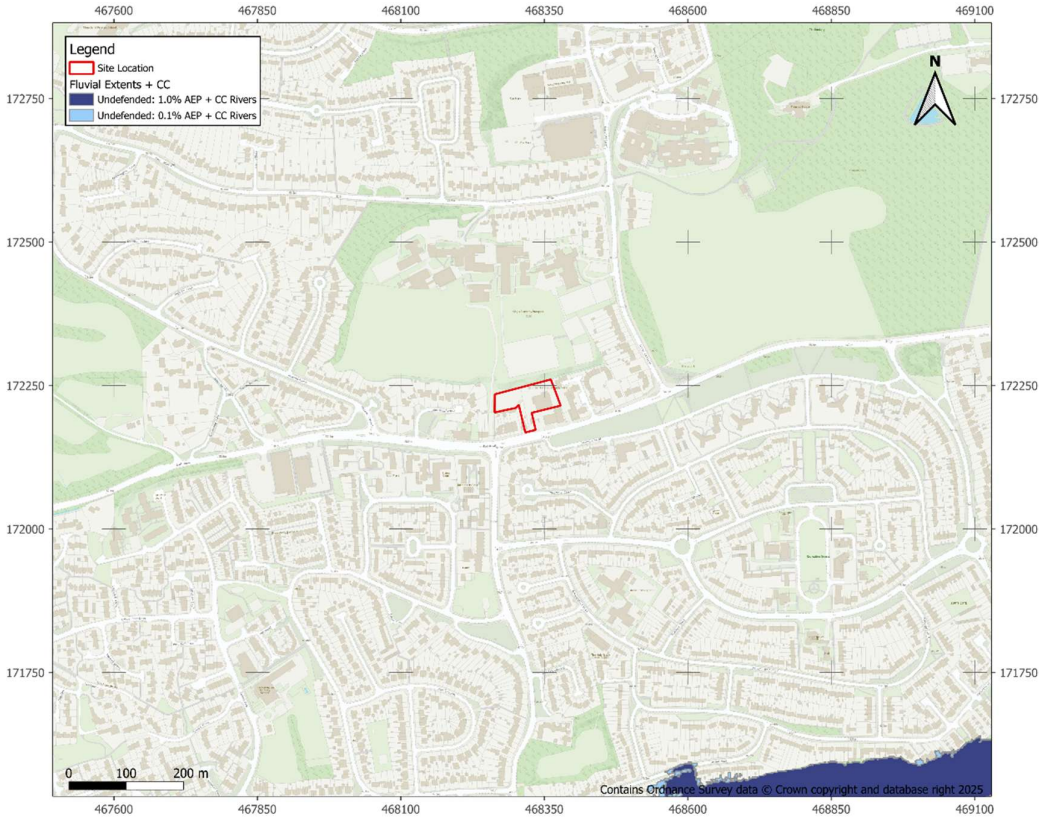


Figure 4 – Fluvial Climate Change Flood Map

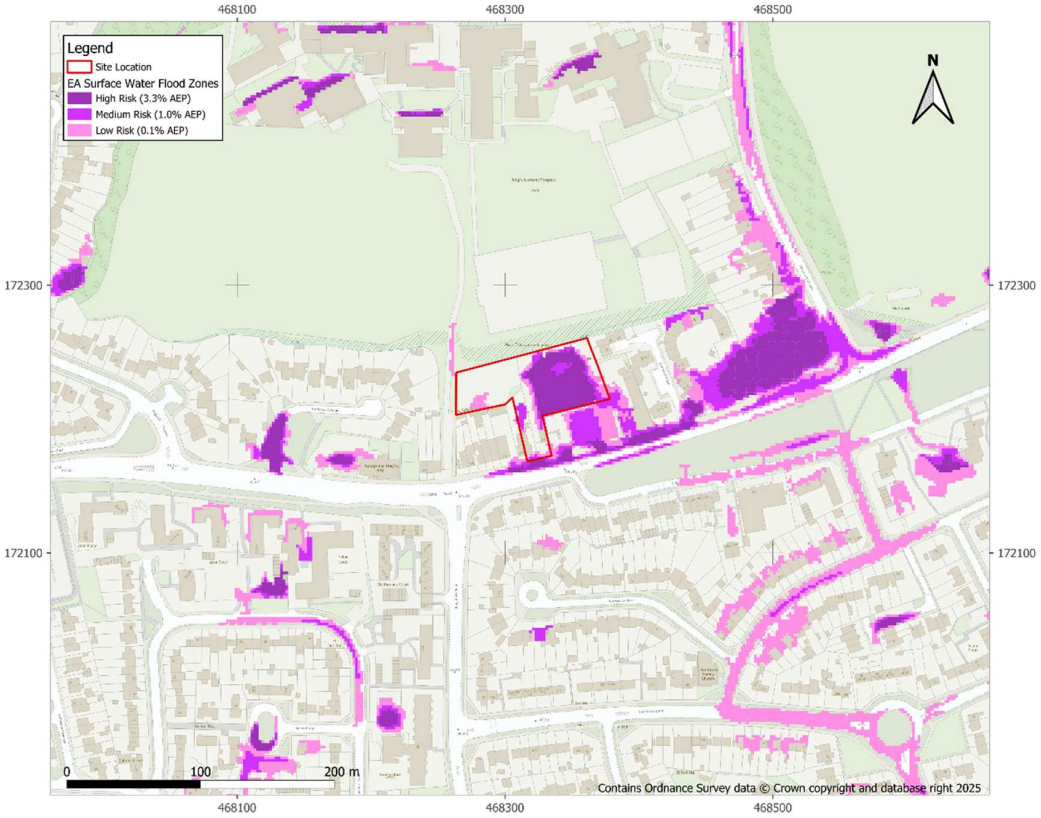


Figure 5 – Surface Water Flood Map

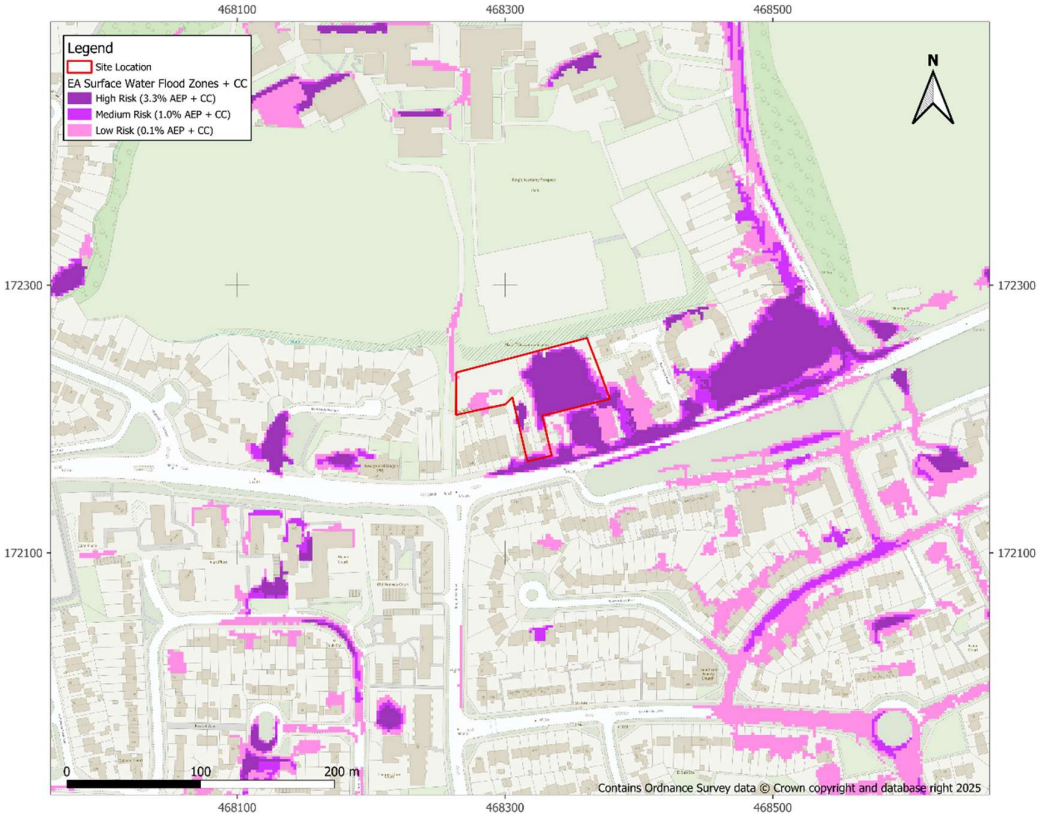


Figure 6 -Surface Water Climate Change Flood Map

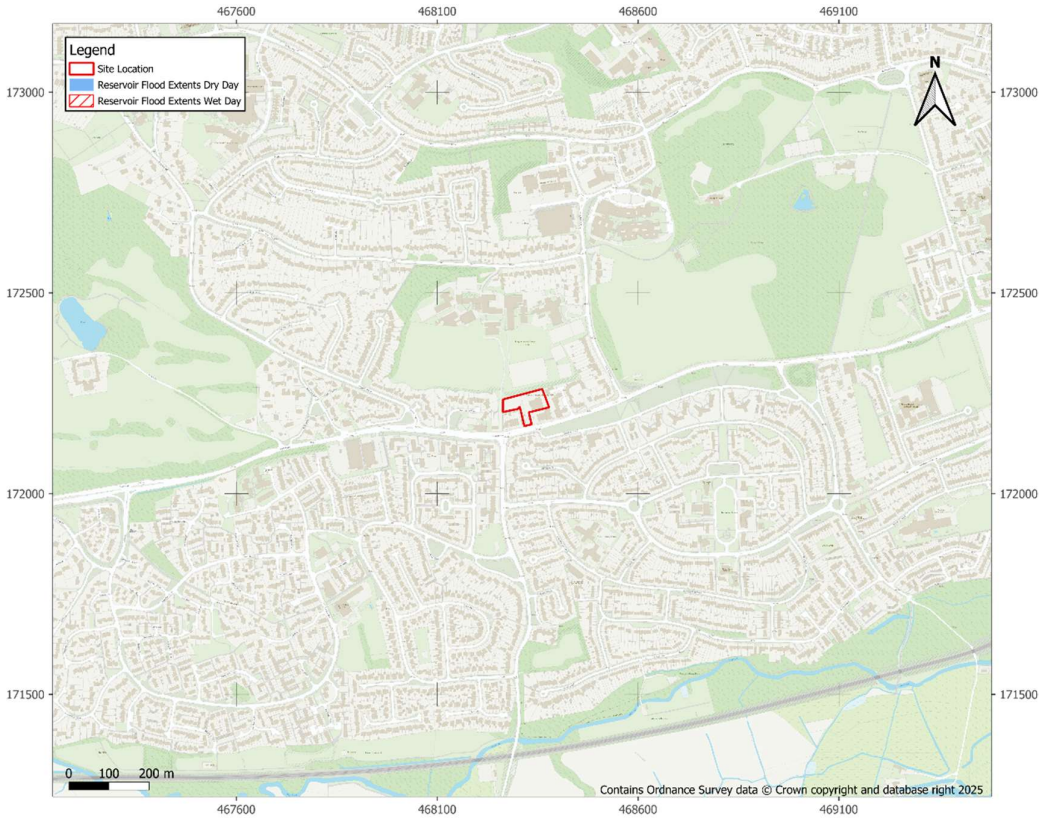


Figure 7 - Reservoir Failure Flood Map

4 Detailed Review of Primary Flood Risk

4.1 Primary Flood Risk

Pluvial flooding is considered to be the primary flood risk mechanism at the site and is therefore assessed in more detail in the section below.

4.2 Flood Risk Metrics

The EA surface water flood maps plus climate change were assessed for further detail on potential surface water flooding at this location. For the design 100-yr plus climate change event, 46% of the site is inundated. The current extents are based on national scale mapping, so velocity data is not available however depth banding is available. The maximum potential depth on-site is in the 0.3-0.6m depth band, however the most common band is 0-0.2m.

The mapping shows surface water flood risk to be largely focused in the east of the site. Furter analysis of LiDAR data shows there is a shallow basin in the east of the site, which is likely responsible for the surface water flooding. OS Mapping shows a drain directly north of the site boundary, which is not clearly captured by the LiDAR data. This could help convery surface water flows thereby surface water flooding in reality could be less severe if a drain is present. However, this should be assessed in further detail as part of a site-specific FRA.

4.3 Access and egress

Vehicular access to and from the site is possible westward along Bath Road, then northward onto New Lane Hill. This route is the quickest route to higher ground and therefore would provide relative safety from flooding. The proposed route is entirely within Flood Zone 1 and avoids major surface water flood pathways, see Figure 8.

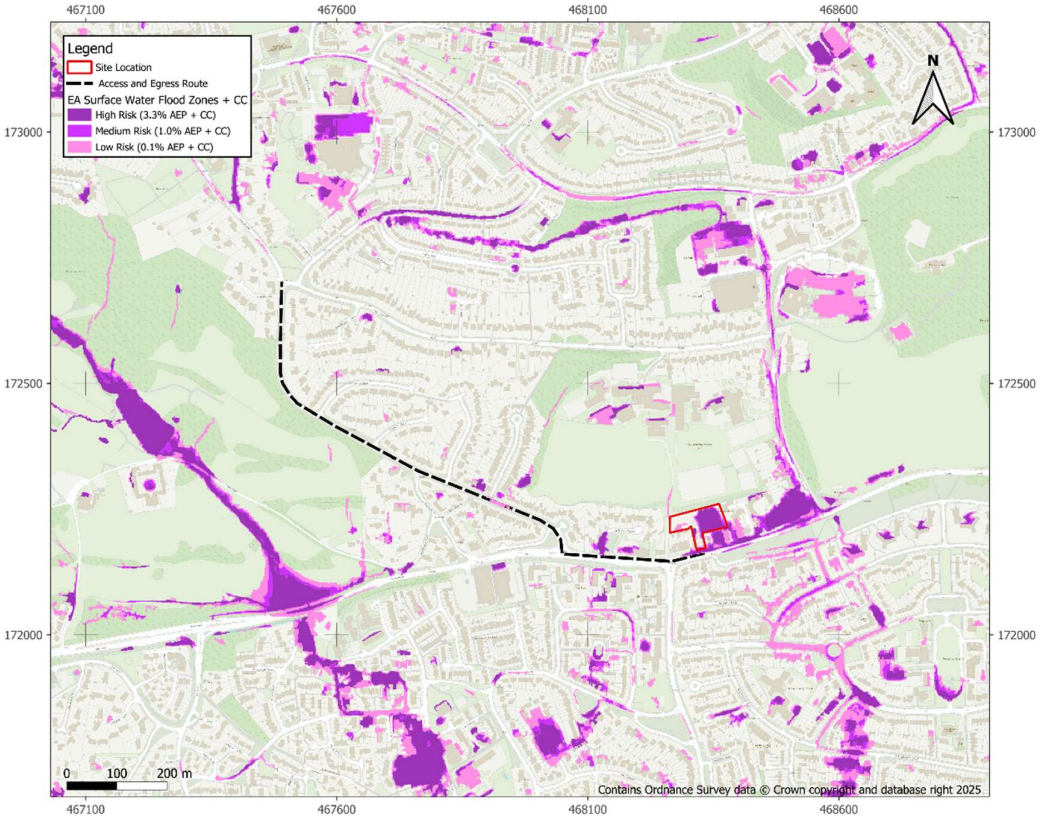


Figure 8 – Access/Egress Routes

5 Development Viability and FRA recommendations

5.1 Development Categorisation

The proposed development will consist of housing which is considered a *More Vulnerable* Development. *More Vulnerable* infrastructure is permissible in Flood Zone 2 but must pass an Exception Test if located in Flood Zone 3a, as specified in the latest NPPF. *More Vulnerable* infrastructure is not permissible in Flood Zone 3b. The entire site boundary is in Flood Zone 1, therefore fluvial flooding does not present a barrier to development at this site.

Pluvial flooding is significant at the site covering a large proportion of the site (46%) in the design 1.0% AEP plus climate change event. The analysis presented herein is based on national scale mapping, it is recommended it is assessed in more detail as part of a site-specific FRA with potential development of a bespoke hydraulic model to better inform flood risk.

5.2 Scale of Development

The total site area is 0.51 ha; allocated for between 15-23 dwellings. Currently a large proportion of the site is within the surface water flood extents. These will need to be considered when choosing where to locate infrastructure on site. As mentioned above further analysis is recommended to verify the surface water flood extents.

5.3 Sequential Approach

A sequential approach should be undertaken using the surface water flood extent prioritising more vulnerable residential development in lower flood risk areas (outside of the design flood extent if possible) with ancillary infrastructure such as car parks and green spaces located in higher flood risk areas if required. This is on the assumption that it does not increase flood risk elsewhere and is designed to be appropriately resistant and resilient to flooding. For this site it is recommended that the surface water climate change extents are used, which more clearly show the graduation in flood risk across the site.

5.4 Other Site-Specific Considerations

A site-specific FRA should consider in more detail the nature of the surface water flood risk to determine how quickly it occurs and the degree of hazard on site as there is some uncertainty in the national scale mapping. This may involve development of a bespoke surface water model for the site. If new infrastructure is proposed, the drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that surface water flood risk at the site and to 3rd party land is not increased. The site currently consists of mostly impermeable land use, meaning that there is scope to reduce the impermeable area within the site boundary, therefore potentially reducing site runoff and providing a betterment in terms of local flood risk.

In assessing and demonstrating the viability of any drainage solution for the site, a site-specific FRA should follow the non-statutory technical standards for SuDS and any relevant Local Authority Local Plan policies. The local soils at the site have impeded drainage. Therefore, infiltration SuDS solutions may not be possible. It is recommended that a geotechnical investigation is undertaken at this site to obtain further information relating to infiltration rates, this will confirm whether infiltration could be viable in some areas. Attenuated discharge to a watercourse will also need to be considered as part of a site-specific FRA. Discharge to sewer should be avoided, as per the RLDP.