



HMCTS READING TRIBUNALS COURT (SOVEREIGN HOUSE)

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1. Introduction

1.1 Purpose of this Report

This report summarises the assessment of flood risk for a proposed refurbishment of Sovereign House located at Vastern Road, Reading, RG1 8BT. This report presents the findings of the assessment of flood risk, to and from the proposed Development, and where necessary provides an appraisal of possible mitigation measures to reduce the flood risks to acceptable levels.

The following tasks have been undertaken:

- A review of existing data and information.
- An assessment of the flood risks to the site, and the possible flood risks which could occur as a result of the proposed Development; and
- Where necessary, an assessment of the proposed measures to reduce the flood risk to acceptable levels.

1.2 Background

This study has been carried out in accordance with the National Planning Policy Framework (NPPF)¹. As part of the planning process, the NPPF requires a flood risk assessment from proposed developments that are:

- Within Flood Zones 2 or 3 including minor development and change of use.
- More than 1 hectare (ha) in Flood Zone 1.
- Less than 1 ha in Flood Zone 1 with a change of use in development type to a more vulnerable class (for example, from commercial to residential), where the development could be affected by sources of flooding other than rivers and the sea (for example, surface water drains or reservoirs).
- In Flood Zone 1 with critical drainage problems as notified by the Environment Agency (EA).

The EA flood maps have been reviewed and show that the proposed Development lies within Flood Zone 2, therefore a Flood Risk Assessment (FRA) is required.

The broad aim of the NPPF is to reduce the number of people and properties within the natural and built environment at risk of flooding. To achieve this aim, planning authorities are required to ensure that flood risk is properly assessed during the initial planning stages of any development.

Responsibility for this assessment lies with developers and they must demonstrate the following:

- Whether the proposed Development is likely to be affected by flooding.
- Whether the proposed Development will increase flood risk to adjacent properties.
- That the measures proposed to deal with any flood risk are sustainable.

The developer must demonstrate to the Local Planning Authority and the EA that the existing flood risk or the flood risk associated with the proposed Development can be satisfactorily managed.

¹ [Technical Guidance to the National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/publishing.service.gov.uk)

1.3 Environment Agency Requirements

The detail and complexity of a FRA should reflect the level of risk to the proposed Development. Guidance is available on the EA's website². The guidance is based on the requirements for different development scenarios, based on the size of the development and the location within the floodplain. The proposed Development falls within Flood Zone 2; this indicates a medium risk of fluvial flooding to the development site. The FRA should therefore contain:

1. A location plan and a site plan. The site plan should show the existing site, development proposals and identify any structures which may affect local hydraulics.
2. Surveys showing existing and proposed site levels.
3. An assessment of the flood risk, including:
 - Your site address.
 - A description of your development.
 - An assessment of the flood risk from all sources of flooding for your development, plus an allowance for climate change.
 - The estimated flood level for your development, taking into account the impacts of climate change over its lifetime.
 - An assessment of the residual risks resulting from the breach or overtopping of any flood defences.
 - Details of the finished floor levels.
 - Details of your flood resistance and resilience plans.
 - Any supporting plans and drawings The remaining (known as residual) risks to the site.
 - Consideration of the proposal relative to any existing Strategic Flood Risk Assessment (SFRA) carried out by the Local Authority.

1.4 Flood Risk

Flood risk includes the statistical probability of an event occurring and the scale of the potential consequences. The risk is estimated from historical data and expressed in terms of the expected frequency (or 'return period') of a flood of a given magnitude. The 10-year, 50-year and 100-year floods have a respective 10%, 2% and 1% chance of occurring in any given year (this is termed the Annual Exceedance Probability [AEP]), however, over a longer period the probability of flooding is considerably greater. For example, for the 100-year return period flood, there is a:

- 1% chance of the 100-year flood occurring or being exceeded in any year.
- 26% chance of it occurring or being exceeded in a 30-year period.
- 51% chance of it occurring or being exceeded in a 70-year period.

Table 1-1 provides a summary of the relevant AEP and corresponding return periods.

Table 1-1 Definition of AEP and 'return period' flood events

AEP (%)	Return period (years)
50%	2
10%	10
2%	50
1%	100
0.5%	200
0.1%	1,000

² <http://www.environment-agency.gov.uk/research/planning/93498.aspx>

2. Site Description

2.1 Existing Site

His Majesty's Courts and Tribunals Services (HMCTS) have purchased Sovereign House (hereafter referred to as 'the site') in 2024. The site is located 140m NE of Reading Station. It comprises of the Sovereign House which is a 17.7m high office building, comprising of 3 floors, on a site with an area of 0.24 hectares (2430m²). Currently, the site is not in use since being purchased by HMCTS, and due to it being a refurbishment of an existing building, it can be classed as brownfield.

The building Sovereign House is primarily known as an office building and has housed various organisations and businesses over the years. One notable tenant was Sovereign Housing Association, which occupied the building for a significant period, hence the name. Sovereign Housing Association is one of the largest housing associations in the UK, providing affordable housing across Southern England.

The site is located on Vastern Road which is a classified highway network with River Thames Walk easily accessible from the site. The surrounding area is characterised by a mix of office (Thames water utility company offices, Sterling insurance company offices), retail (The Range – homeware shop) and residential developments (Thames Quarter).

Berkeley Homes has recently secured planning permission at appeal for an extensive housing development on the former SSE site, adjacent and to the west of Sovereign House. The scheme will have six blocks of between 1 and 11 storeys.



Figure 2-1 Location of Development Site

2.2 Proposed Development

The refurbishment of Sovereign House into a Tribunals Court represents a significant step forward in modernizing judicial facilities under the Ministry of Justice (MoJ) and HMCTS. AtkinsRéalis (ARÉ) has been commissioned to provide comprehensive project management and multidisciplinary services from RIBA Stage 0 to Stage 3, for the establishment of the Tribunals Courts at Sovereign House, located in Reading. Following refurbishment, the building is to accommodate the following:

- 2no. hearing rooms to SSCS Standard type 2 (with dias)
- 5no. hearing rooms for Employment Tribunals Type 2
- 10no. Judicial offices
- 1no. staff meeting room (staff admin area with tea point for 10 staff)
- 1no. medical room / prayer & contemplation / wellbeing room (multifunction space)
- 1no claimants waiting room for 10 people
- 1no. respondent waiting for 10 people
- 4no. consultation rooms for 4 people
- Server / comms rooms
- a security office (near reception)
- provision of EV charging to two car parking spaces
- new gated access for car park
- an entrance is required into the secure corridor from the car park
- an external lift is required to provide level access to the secure corridor

2.3 Topography

The proposed Development site is situated on a relatively flat topographic terrain at an average elevation of 38.5m AOD, ranging from 38.5m AOD to 39.0m AOD. The surrounding areas, including the Vastern Road have an elevation of 38.0m AOD, 0.5-1m below that of Sovereign House.

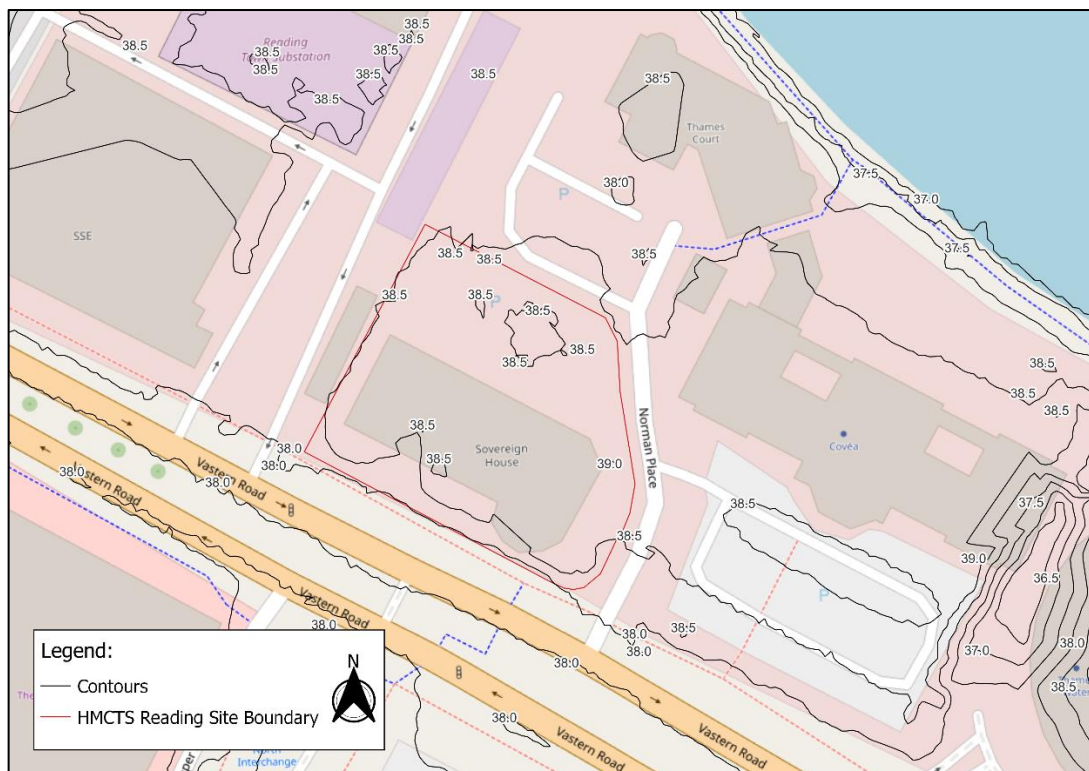


Figure 2-2 Topographic Terrain of the Development Site

2.4 Geology

A geotechnical desk study of the site was undertaken using readily available information from online sources, published data, and historical information.

The proposed Development site is underlain primarily by the bedrock geology of “Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated) – Chalk”³. The Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated) – Chalk is described by the British Geological Survey as a Chalk with flints - With discrete marl seams, nodular chalk, sponge-rich and flint seams throughout. Typology of flints and incidence of marl seams is important for correlation.

The Site is underlain by the superficial geology of Langley Silt Member - Clay and Silt. The Langley Silt Member - Clay and Silt is described as varying from silt to clay, commonly yellow-brown and massively bedded. The aquifer designation classification of the “White Chalk Subgroup” bedrock is Principal aquifer. The highly productive aquifer is up to 450 m thick and yielding 50 to 100 L/s from large diameter boreholes and up to 300 L/s from adited systems. Hard to very hard, good quality water⁴.

The proposed Development is not within a Source Protection Zone⁴.

2.5 Soils

Soil information was obtained from Soilsclapes viewer⁵. The soil underlying the proposed Development site is Soil Type 6 which is described as Freely draining slightly acid loamy soil.

³ [GeolIndex - British Geological Survey \(bgs.ac.uk\)](https://www.bgs.ac.uk)

⁴ [Magic Map Application \(defra.gov.uk\)](https://magic.defra.gov.uk)

⁵ [Soilsclapes soil types viewer - Cranfield Environment Centre, Cranfield University \(landis.org.uk\)](https://landis.org.uk)

3. Existing Data and Information

3.1 Local Flood Risk Management Strategy (LFRMS)⁶

The Reading Borough Council LFRMS is a legal document that provides a framework for addressing the risk of flooding across the city of Reading. Key flood risk information relevant to and around the vicinity of the proposed Development has been extracted for this report.

The objectives for Readings Local Strategy and Local Flood Risk Management are reflective of the requirements of the FWMA and the NFCERMS. The objectives are shown below:

1. To improve knowledge of Local Flood Risk within Reading Borough including collating and mapping all existing flood risk data.
2. To identify areas where flood risk is high or identify where there is future flood risk as a result of development or climate change.
3. To engage with local communities to; increase awareness of local flood risk; consult on potential mitigation measures; and inform residents of the work RBC undertake as a LLFA in managing this risk.
4. To reduce existing flood risk from local sources within the Borough.
5. To inform planning strategies and policies to facilitate flood risk management and mitigation from all local sources of flood risk except Main Rivers and reservoirs.
6. To prevent an increase in flood risk as a result of new development within the Borough.
7. To improve co-operation between Reading Borough Council and the Risk Management Authorities (RMAs).
8. To facilitate RBC as LLFA in undertaking the duties and responsibilities under the FWMA and the EU Flood Directive.
9. To set out the guiding principles for SuDS in the Borough.
10. To promote sustainability of Flood Risk Management through Water Framework Directive compliance, Climate Change Adaptations, Land Management and the protection and enhancement of habitats and biodiversity.
11. To take a holistic approach to flood management ensuring that the non-flood related benefits of schemes are maximised, selecting those with multiple and environmental benefits where practicable, and factoring in the monetary value of the additional benefits into the calculations.

3.2 Thames Catchment Flood Management Plan⁷

The River Thames, which lies adjacent to the site, falls within the Thames Catchment Flood Management Plan. The River Thames Catchment Flood Management Plan is divided into nine distinct sub-areas that have similar physical characteristics, sources of flooding and levels of risk (Appendix B. These sub-areas will allow the Environment Agency and the Lead Local Flood Authority (Reading Borough Council) to promote flood risk management approaches, policies, and actions that are most appropriate to deliver the various Government and regional strategies. The most appropriate approach

⁶ [Reading Borough Council - Local Flood Risk Management Strategy](#)

⁷ [Thames: Catchment flood management plan - GOV.UK](#)

to managing flood risk for each sub-area has been identified and allocated one of the six generic flood risk management policies (Appendix C).

The proposed Development site falls within the Abingdon, Byfleet and Weybridge, Guildford, Hoe Stream, Lower Lee, Lower Roding, Lower Thames, Oxford and Reading area. The vision and preferred flood risk management policy for this sub-area is Policy Option 8 where flood risk is low for the specific area of the existing building.

The current level of fluvial flood risk is relatively high to the surrounding area of the building due to the proximity to the River Thames and is suggested it will increase with climate change.

3.3 Reading Strategic Flood Risk Assessment⁸

The Strategic Flood Risk Assessment (SFRA) indicates that there are various types of flood risk present, with fluvial flooding from the main rivers and ordinary watercourses being the primary source. Surface water flooding is low to medium for the surrounding area.

Local flood risk within Reading is widespread and derives from a range of different sources that often interact with each other. For example, surface water flood risk often interacts with sewers, highway gullies, and non-main rivers of which many are culverted or partly culverted and form much of the drainage infrastructure in the City.

The main risk of flooding in Reading is from Main Rivers (specifically the River Thames, River Kennet and Holy Brook) with flooding from this source being reported as recently as January 2024. The Reading Strategic Flood Risk Assessment (SFRA) indicates that 18/20 historic flooding reports from 1894-2024 are from a Main River source.

Flood risk from groundwater has not been historically significant in Reading, as there are no extensive records of historical flooding from groundwater. Although, the chalky formations of the site due to their high groundwater recharge, can potentially lead to high groundwater levels and an increased risk of groundwater flooding during extensive wet periods. The likelihood of groundwater flooding occurring in Reading is generally low, but if it were to occur – the rate of water level rises from groundwater flooding is slow; hence, groundwater flooding does not generally pose a significant risk. Appendix B of the Reading LFRMS indicates that the site is not in an area with a modelled susceptibility to groundwater flooding that is greater than 75%.

From the Reading SFRA there are no extensive records of historical flooding from surface water runoff in Reading, as the historic flooding reports lists only contain two incidents attributed to surface water between 1894–2024, the most recent being in 1977, both of which included interactions with main rivers.

The Reading SFRA indicates that the RG1 postcode has 14 total number reports of sewer flooding since 1989, since privatisation – however, none of these reports are attributed to a particular location so are likely to have been caused by blockage or failure of local sewer assets that have since been repaired by the sewerage undertaker.

⁸ [Reading Borough Council - Level 1 Strategic Flood Risk Assessment](#)

3.4 Environment Agency Flood Map for Planning⁹

The Flood Map published by the EA contains flood zones for use in accordance with the NPPF and represents the risk of flooding from rivers and the sea. Flood Zone 1 represents a low probability of flooding, which means there is less than 0.1% (1 in 1,000 years) annual probability of flooding from rivers or the sea. Flood Zone 2 represents a medium probability of flooding, which means there is a 1% (1 in 100 years) to 0.1% (1 in 1,000 years) annual probability of flooding from rivers, or 0.5% (1 in 200 years) to 0.1% (1 in 1,000 years) annual probability of flooding from the sea. Flood Zone 3 represents a high probability of flooding, which means there is a 1% (1 in 100 years) or more annual probability of flooding from rivers, or a 0.5% (1 in 200 years) or more annual probability of flooding from the sea.

The Flood Map for Planning is a high-level strategic illustration of the flood risk extent along main rivers. In addition, the flood zone extent illustrated in the Flood Map for Planning does not consider the possible impacts of surface water flood risk, the probability of changing flood risk consequential to climate change, and fluvial or coastal flood defences

The EA Flood Map for Planning shows the proposed Development falls within Flood Zone 2 (Figure 3-1).

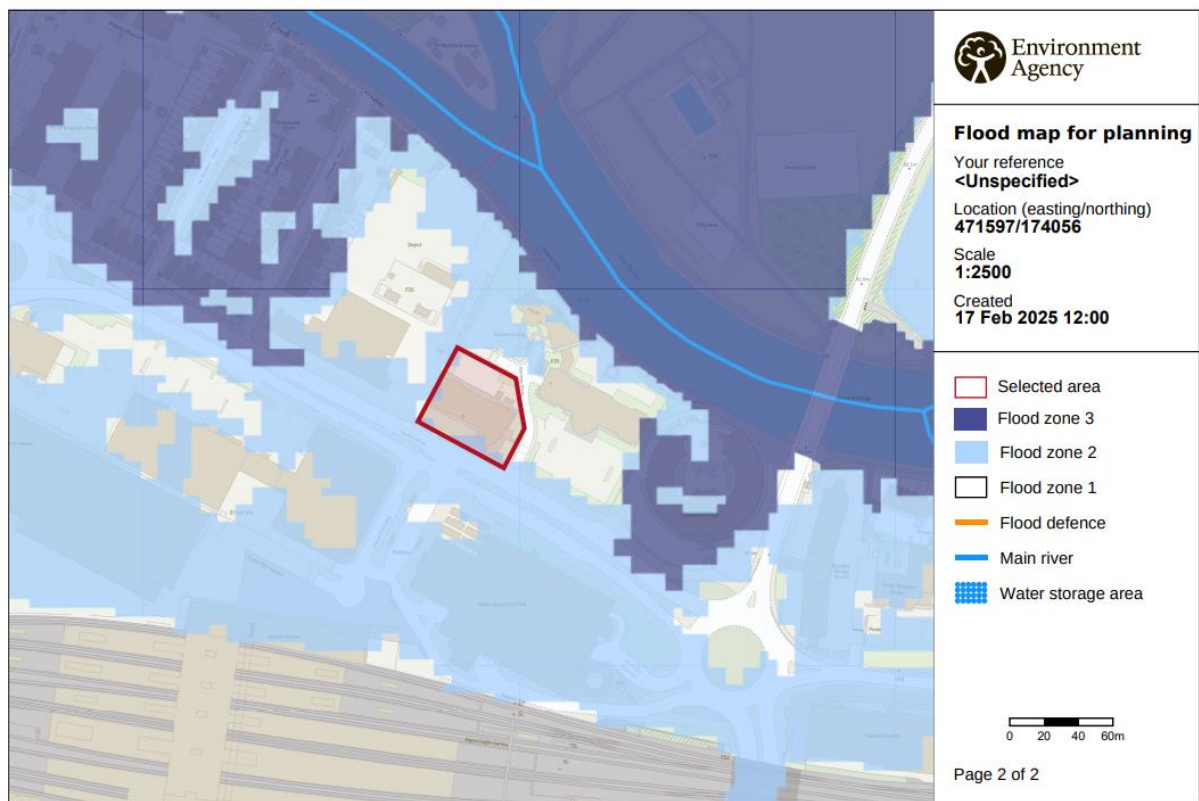


Figure 3-1 Environment Agency Flood Map for Plannin

⁹ [Flood map for planning - GOV.UK \(flood-map-for-planning.service.gov.uk\)](https://flood-map-for-planning.service.gov.uk)

3.5 Environment Agency Risk of Flooding from Rivers and Sea¹⁰

The Flood Risk from Rivers and Sea is a high-level strategic map of the extent of flood risk from main rivers. The Flood Risk from Rivers and Sea is based on predicted flood and ground levels and considers the presence and effect of flood defences, unlike the Flood Map for Planning. However, flood defences reduce but do not completely avert the chance of flooding as defences can be overtopped or fail.

High risk represents a greater than 3.3% annual probability of flooding. Medium risk represents between 1% to 3.3% annual probability of flooding. Low risk represents between 0.1% to 1% annual probability of flooding. Very low risk represents less than 0.1% annual probability of flooding.

The EA Risk of Flooding from Rivers and Sea map shows the proposed Development does not fall within the risk of fluvial flood extent (Figure 3-2).

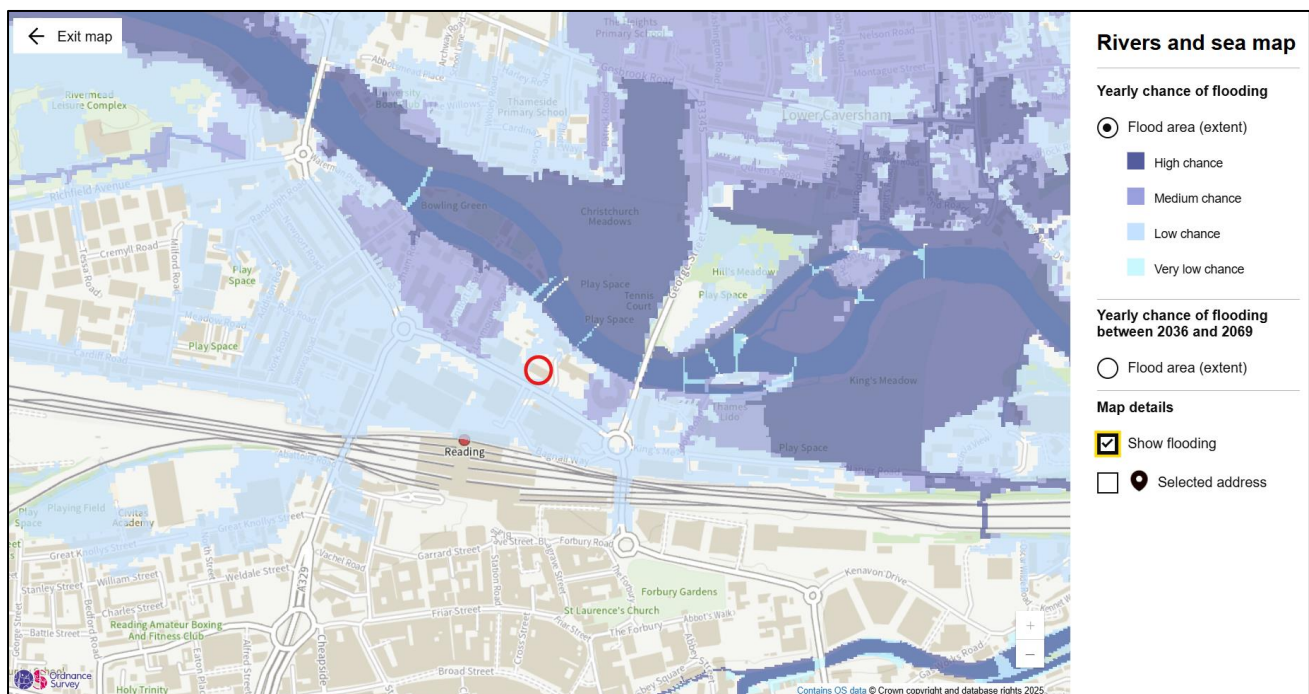


Figure 3-2 Environment Agency Flood Risk Map from River and Sea

3.6 Environment Agency Risk of Flooding from Surface Water

Surface water flooding occurs when rainwater cannot drain away through the normal drainage systems. This tends to affect areas with impermeable surfaces more severely. Therefore, the rainwater instead pools or flows overground. Surface water flooding can be difficult to predict as it is dependent on rainfall volume and

¹⁰ [Learn more about this area's flood risk - Check your long term flood risk - GOV.UK \(check-long-term-flood-risk.service.gov.uk\)](https://www.gov.uk/check-long-term-flood-risk)

location which are both difficult to forecast. In addition, local features can greatly affect the chances and severity of flooding.

'High' risk of surface water flooding means that the Site has a chance of flooding of greater than 3.3% each year. 'Medium' risk of surface water flooding means that the area has a chance of flooding between 3.3% to 1% each year. 'Low' risk of surface water flooding means that the area has a chance of flooding of between 1% to 0.1% each year. 'Very low' risk of surface water flooding means that the area has a chance of flooding of less than 0.1% each year.

The surface water flood risk extent map (Figure 3-3) shows the majority of the proposed Development is generally within an area of very low risk of surface water flooding but there are small areas at low risk of surface water flooding located in close proximity to the site (highlighted in Figure 2-2). This is likely to be caused by the topographic low spots adjacent to the site as the existing building is significantly raised above surrounding ground levels.

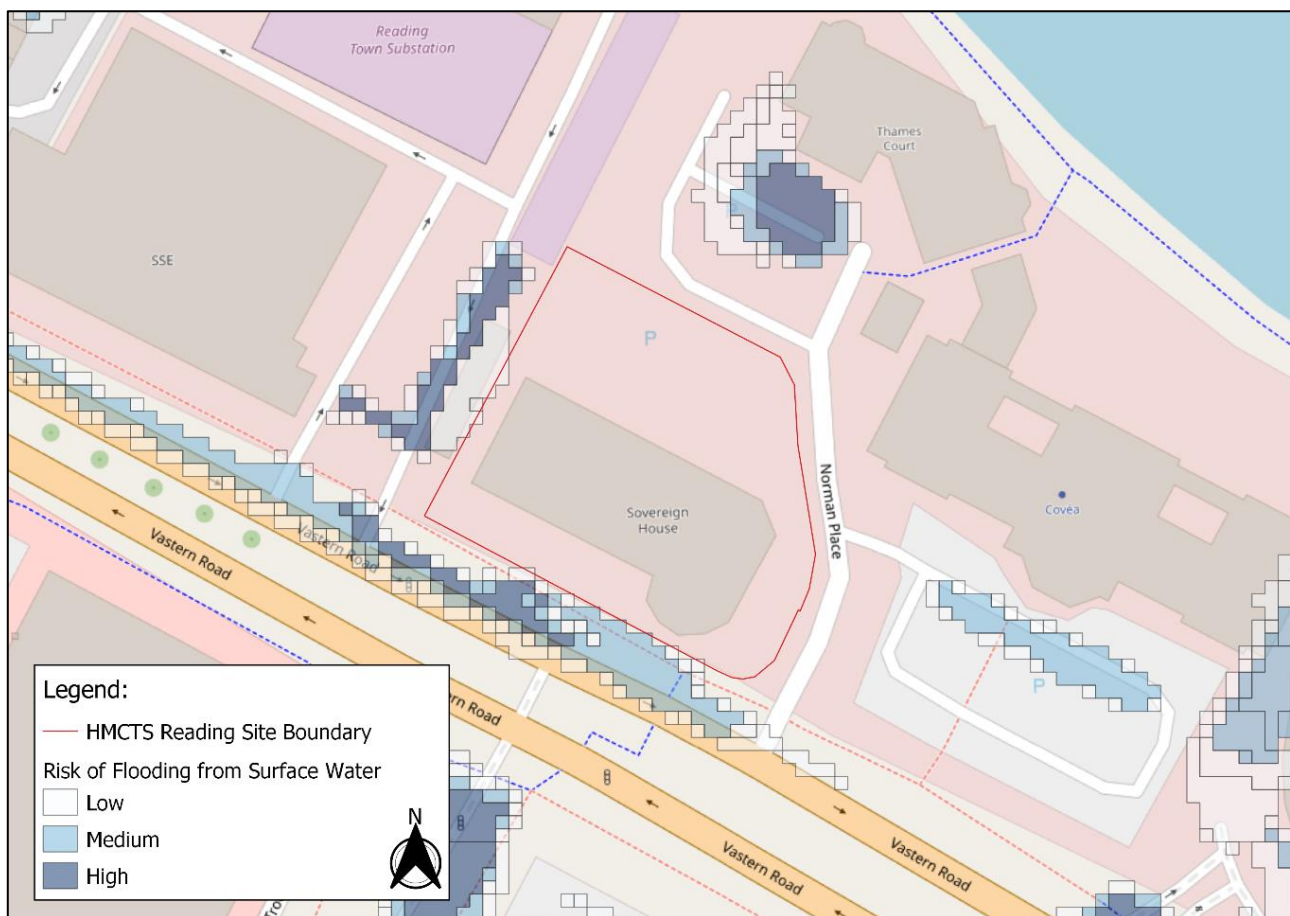


Figure 3-3 Surface Water Flood Risk Map

The surface water flood map of the high-risk scenario shows there are shallow (less than 30 cm) surface water flood depths in the areas adjacent to the development site¹¹ which do not impact the building, or the sites access and egress points. The surface water flood depths within the site boundary are 0cm.

¹¹ [Risk of Flooding from Surface Water - Data.gov](https://data.gov/)

3.7 Environment Agency Risk of Flooding from Reservoirs

The reservoir flood risk map shows the existing building does fall into the risk of flooding in the unlikely event of a reservoir failure when there is flooding from rivers. (Figure 3-4).

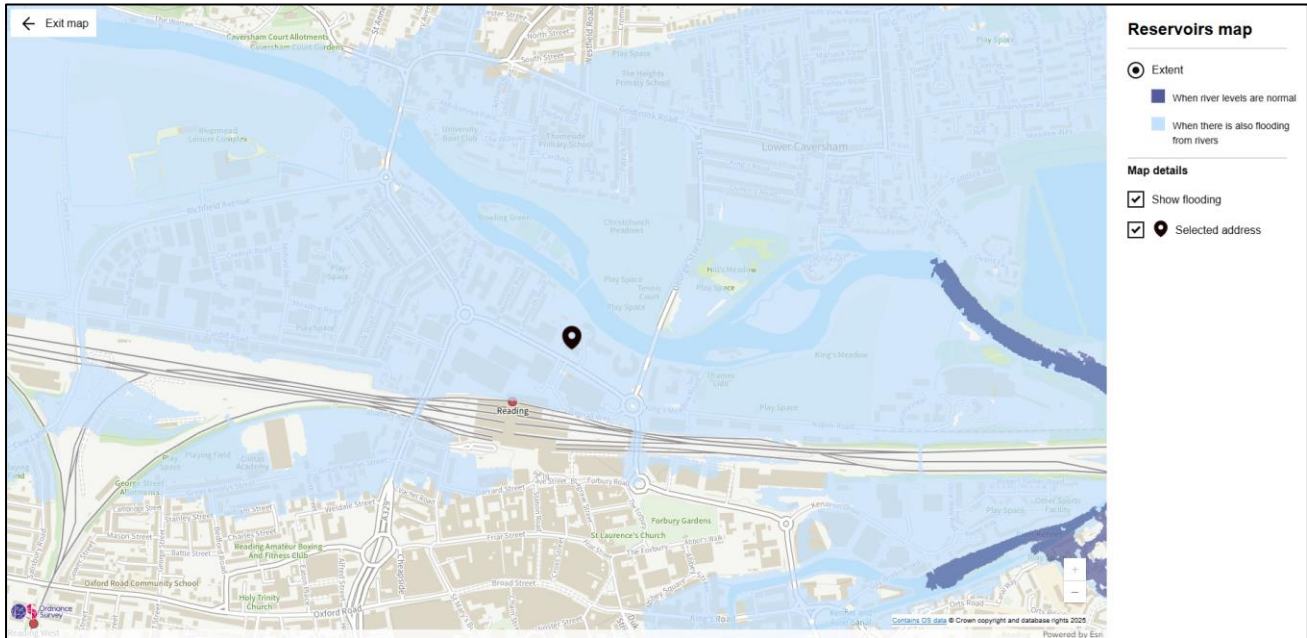


Figure 3-4 Risk of Flooding from Reservoirs

3.8 Groundwater Flooding

Flood risk from groundwater has not been historically significant in Reading, as there are no records of historical flooding from groundwater. However, the chalky formations of the site due to their high groundwater recharge, can potentially lead to high groundwater levels and an increased risk of groundwater flooding during extensive wet periods. The likelihood of groundwater flooding occurring in Reading is generally low, but if it were to occur, the rate of water level rises from groundwater flooding is slow; hence, groundwater flooding does not generally pose a significant risk. Appendix B of the Reading LFRMS indicates that the site is not in an area with a modelled susceptibility to groundwater flooding that is greater than 75%.

The EA “check long term flood risk” service also indicates that the risk of flooding from groundwater is unlikely in this area.

3.9 Historical Flooding¹²

The Historic Flood Map shows the maximum extent of individual recorded flood outlines of areas of land that have previously flooded in England from the river, sea, and groundwater springs that meet a set criterion. This, however, excludes flooding from surface water – except in areas where it is impossible to determine whether the source is fluvial or surface water, but the dominant source is fluvial.

¹² [Defra Data Services Platform](#)

Most records began in 1946, hence, there is limited detail about flooding incidents prior to this date. If an area is not covered by the Historic Flood Map, it does not mean that the area has never flooded, only that there are currently no records of flooding in this area that meet the criteria for inclusion. It is also possible that the pattern of flooding in the area has changed and thus the area would now flood or not flood under different circumstances.

The Historic Flood Map shows the proposed Development site has not historically experienced flooding since records began (Figure 3-5).

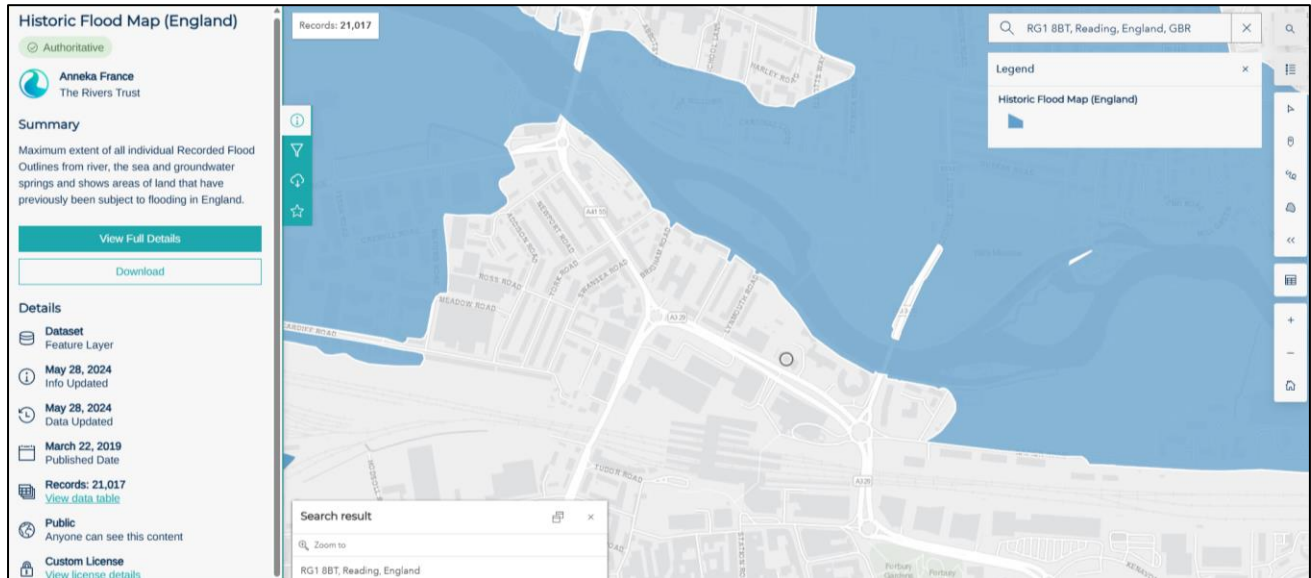


Figure 3-5 - Historical Flood Map

3.10 Site Drainage

There are currently some known elements of the existing drainage infrastructure. A CCTV survey has previously been undertaken on the existing private below ground drainage network within the site boundary.

The CCTV survey indicates that the surface water drainage from the car park, external bike storage and bin store area discharges to an existing 225mm in diameter pipe (Outfall 1) located along the eastern section of the site. The rainwater pipes around the perimeter of the building are understood to discharge into buried pipes and outfall into the 'Vastern Ditch' (Outfall 2 & 3). From the Reading Borough Council Strategic Flood Risk Assessment, this is believed to be a culverted water course that discharges into the River Thames near the Caversham Lock and is understood to be a Reading Borough asset.

The foul water drainage from the building is shown as discharging into the Thames Water foul sewer within Vastern Road.

Further details on the site's drainage such as CCTV plans can be found in the drainage strategy report 377915_15380-ATR-RTC-XX-T-C-0004.

3.11 Flood Warning^{13, 14}

The EA operates a Flood Warning service in areas at risk of flooding from rivers by using the latest available technology to monitor rainfall and river levels 24 hours a day to forecast the possibility of flooding.

The site is situated within a larger geographical area of the River Thames catchment where the EA provides general early notification of possible flooding, known as Flood Alert.

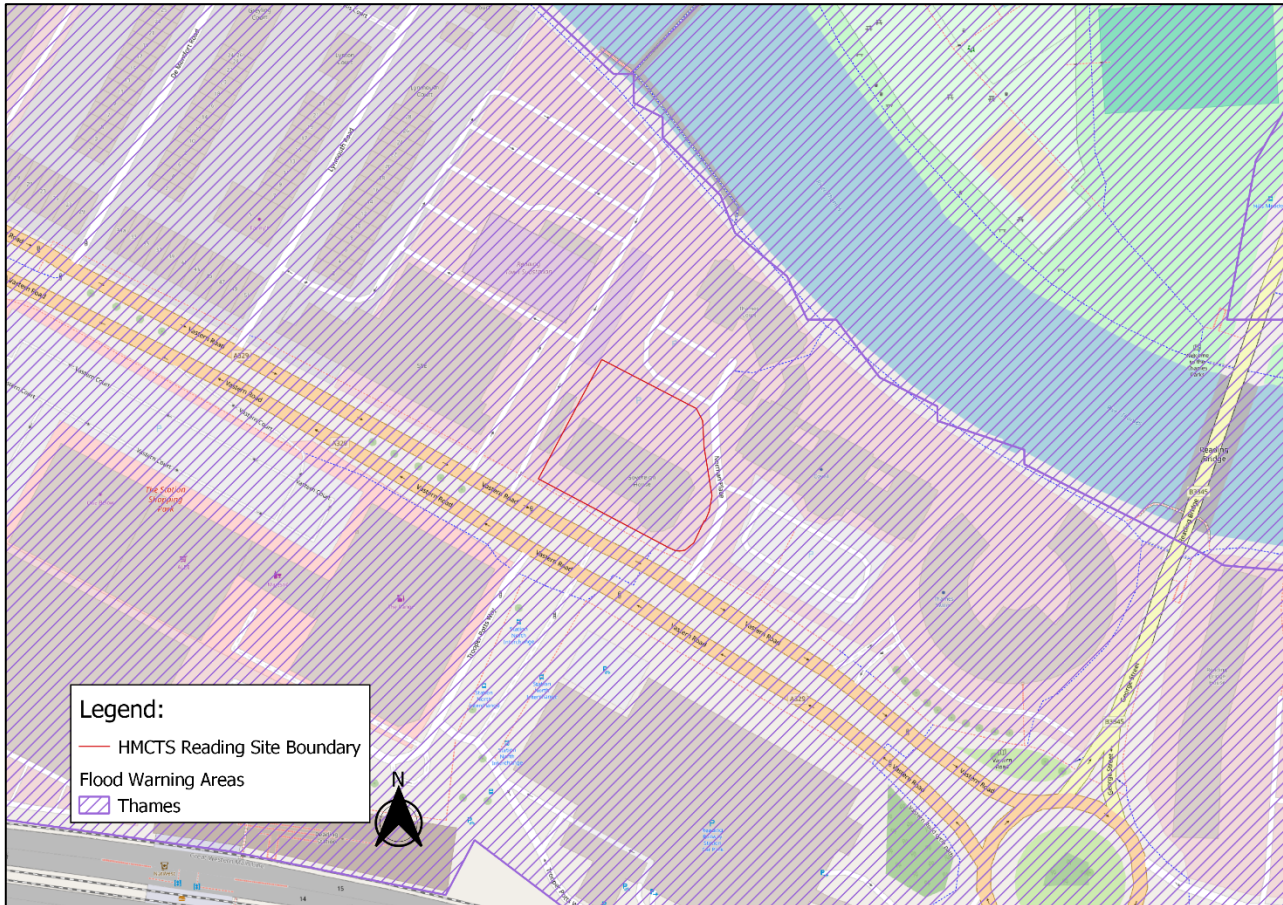


Figure 3-6 - Map of the coverage of the EA Flood Alert and Warning

¹³ [Flood Warning Areas - data.gov.uk](https://data.gov.uk)

¹⁴ [Flood Alert Areas - data.gov.uk](https://data.gov.uk)

4. Assessment of Flood Risk

4.1 Overview

This Flood Risk Assessment has included the following tasks:

- Identification of the site-specific requirements for a flood risk assessment for the development of the site;
- Data collection;
- Assessment of potential risk of flooding to or from the site;
- Requirements for mitigation measures.

4.2 Sources of Flood Risk

There are several sources of flood risk and flood mechanisms which have been investigated as part of this FRA. The sources of flood risk are:

- Fluvial flooding from River Thames
- Surface water flooding;
- Groundwater flooding;
- Sewer flooding;
- Other sources, e.g. reservoir, canal.

4.3 Fluvial Flood Risk

Based on the EA Flood Map for Planning, the majority of the proposed Development site falls within Flood Zone 1, which represents a very low probability of flooding from fluvial sources. However, there is a small overlap of the site boundary within Flood Zone 2 which represents a medium probability of flooding. This means there is between a 1% (1 in 100 years) to 0.1% (1 in 1,000 years) annual probability of flooding from rivers, or 0.5% (1 in 200 years) to 0.1% (1 in 1,000 years) annual probability of flooding from the sea (Figure 3-1). Furthermore, as shown Figure 3-5, based on the Historic Flood Map – the proposed Development has not previously experienced flooding. The areas of the site within Flood Zone 2 are situated around the site boundary but do not touch the building itself.

4.4 Surface Water Flood Risk

The EA surface water flood risk extent maps (Figure 3-3) shows the site predominantly isn't at risk from surface water flooding but there are some small areas of low risk - mainly where the low spots are on the site (Figure 2-2). The depth of surface water flooding within the site boundary is 0cm¹⁵. There is a risk of surface water flooding in close proximity to the site boundary, however this does not impact the access point to the building and therefore does not prevent safe access or ingress to/from the building. The EA surface water flood maps provide an indication of surface water flooding, but they do not consider site specific information such as information regarding floor levels, construction characteristics, or designs of drainage and structures are not considered.

¹⁵ [Technical map - Check your long term flood risk - GOV.UK](#)

4.5 Groundwater Flood Risk

As discussed in section 3.8, the proposed Development falls within an area that could potentially experience groundwater flooding due to its underlying geology. However, there is no recorded incident of groundwater flooding at or within the vicinity of the proposed Development. The EA 'check your long term flood risk' service also concludes that groundwater flooding is unlikely in this area. Nevertheless, this does not mean there is no risk of groundwater flooding. Prolonged periods of rainfall in the surrounding catchment can lead to an increase in groundwater levels and cause groundwater flooding. The main risk of groundwater flooding would be to the external lift as it will have a lift pit below the finish level, however this has been mitigated in the design. The lift pit has been made waterproof by the Structural Engineers, with the provision of a sump to enable pumping should water find its way into the pit.

4.6 Sewer Flooding

Artificial drainage systems and infrastructure within, or in close proximity to the existing building may present a risk of flooding through the capacity of the system network being exceeded or the structural, hydraulic, geotechnical or operational failure of the system infrastructure. The existing building is covered by a network of private drainage systems. It is considered the risk from surcharged sewer flooding is low; nevertheless, residual risk remains during extreme events and incidents of sewer blockage.

4.7 Other Sources

There is no Canal infrastructure within close proximity to the existing building.

As shown in Figure 3-4, the existing building is at risk of flooding in the unlikely event of a reservoir failure, when river levels are normal or in flood conditions. The risk of flooding from reservoir failure is low based on historical flood records and the diligent, continued inspection and maintenance by the operating authority. Reservoirs in the UK have an extremely good safety record with no reservoir failure incidents that resulted in the loss of life since 1925¹⁶.

4.8 Climate Change¹⁷

Climate change is expected to have a major influence on future flood risk. The expectations are that winter floods will occur more often, and in urban areas, flash flooding will be more frequent and of increased magnitude.

The EA Flood Map does not currently take account of future climate change. The NPPF advises that the effects of climate change at a regional level are likely to increase rainfall intensities and river peak flows; therefore, these impacts should be considered in the preparation of site-specific FRAs.

The EA Climate Change allowances have been adopted for the use of this study. As shown in Figure 4-1, the Thames and South Chilterns Management Catchment peak river flow allowances were used for the proposed Development, using the 2080s Central 31%, Higher 43%, and Upper 76% climate change allowance.

¹⁶ Biennial report on reservoir safety: 1 January 2019 to 31 December 2020 - GOV.UK (www.gov.uk)

¹⁷ Climate change allowances for peak river flow in England ([data.gov.uk](#))

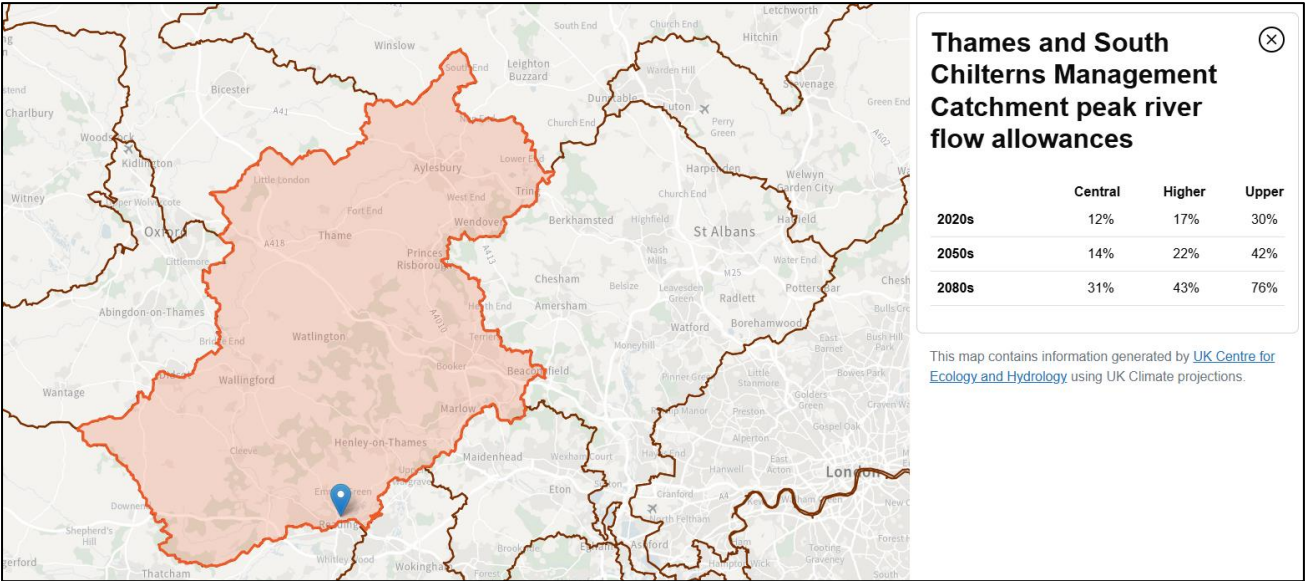


Figure 4-1 The Thames and Chilterns Catchment peak river flow climate change allowances

5. Mitigation of Flood Risk

Section 4 identified the potential flood risks to the existing building. This section sets out the principles of how these risks will be mitigated through appropriate design and operation of the existing building.

5.1 Fluvial Flooding

On the EA Flood Map for Planning, the proposed Development is situated in Flood Zone 2: medium probability of flooding (Figure 3-1). No mitigating action is deemed necessary for fluvial flood risk. This is due to the existing building sitting significantly higher than the surrounding ground levels that are within the flood zone and having never flooded historically.

The elevation of the existing building is an important consideration at the EA Flood Map for Planning generates its Flood Zones from a Digital Terrain Model (DTM) which does not consider built structures, e.g. walls, steps, and buildings. The survey of the site demonstrates that the building is approximately 0.8-1.0m above the surrounding ground levels and Vastern Road, and there is an approximately 2m tall brick wall protecting the site along its western perimeter which is not considered by the EA Flood Map for Planning. There is minor variance in the buildings finished floor levels (FFLs), on average they are 38.92mAOD. LiDAR levels of Vastern Road demonstrate that the elevation is approximately 37.90mAOD (Figure 5-1).



Figure 5-1: LiDAR elevation of Vastern Road (source: SCALGO)

5.2 Pluvial / Surface Water Flooding

The NPPF requires new developments to not exacerbate flood risk through the reduction of current flood storage capacity at the development site or increasing the runoff from the proposed Development.

Any surface water flood risk should be managed by directing overland flow away from the infrastructure and assets and then contained/conveyed within the proposed Development site or a drainage system is appropriately designed to ensure there is no increased off-site overland flow.

As this is a change of use application, with only minor changes to the external areas of the site, there will not be an increase in runoff when compared to the existing regime. It will also not exacerbate any surface water flooding issues as the changes in external areas are managed within the surface water drainage network. Therefore, the proposal will not exacerbate flood risk or reduce current flood storage capacity. As such, no specific mitigation measures are proposed for surface water flooding.

Climate change will likely impact the development site. The site falls in the Thames and South Chilterns Management Catchment, and therefore the upper end peak rainfall allowances for this catchment have been used in the design of the surface water drainage system. These can be seen in Figure 5-2. The surface water drainage system has been designed to attenuate the 1 in 100 year rainfall event +40% climate change allowance.

A separate detailed drainage report has been completed for the proposed Development site which demonstrates how surface water runoff associated with the proposed refurbishment will be managed (377915_15380-ATR-RTC-XX-T-C-0004).

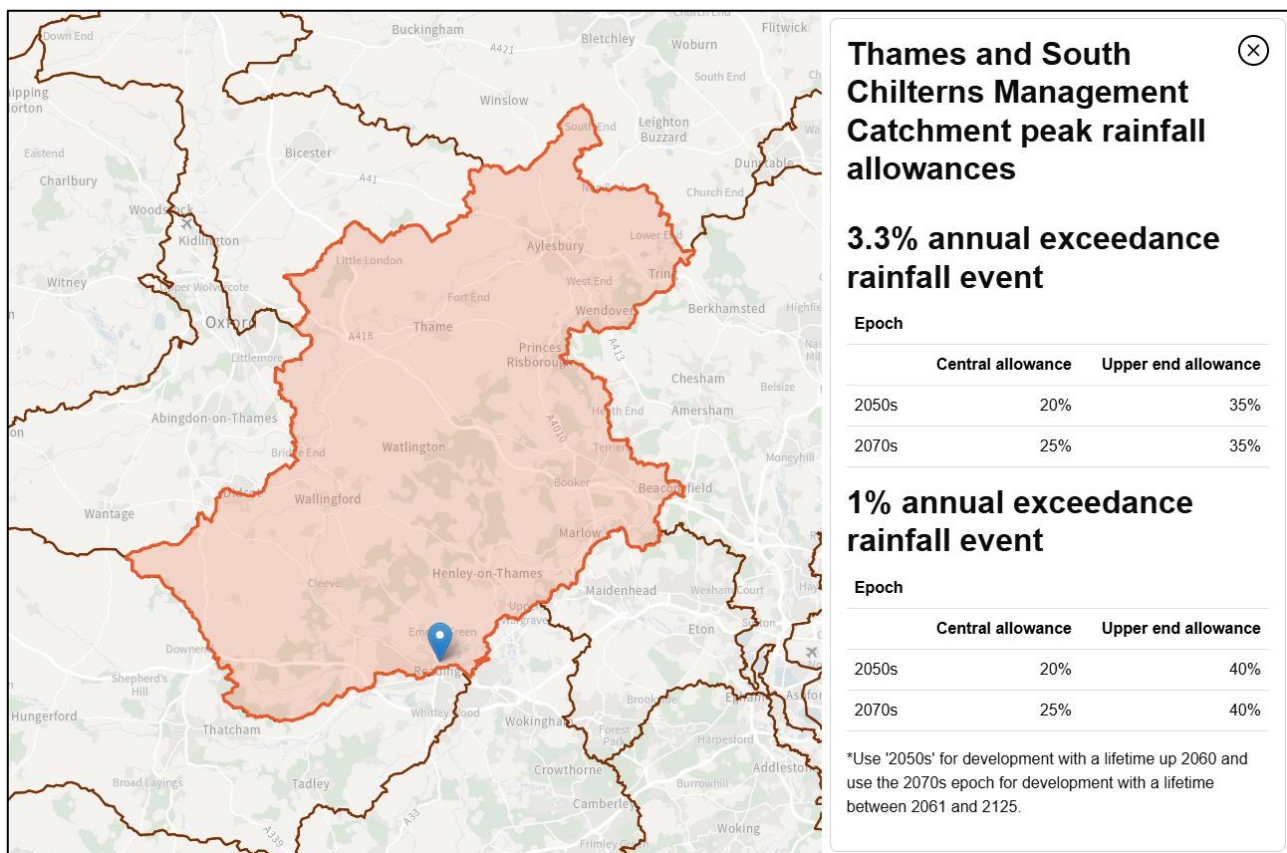


Figure 5-2: Peak rainfall allowances for the development site (source: Environment Agency)

5.3 Flooding from Sewers

No new surface water runoff and conveyance systems are proposed for the existing building. There are no historic reports of any sewer flooding at the site, therefore, it can be concluded that there is a low risk of flooding from any existing onsite drainage systems and therefore there are no specific mitigation measures proposed.

5.4 Flooding from Groundwater

Upon the evaluation of potential groundwater flood mechanisms and the geological and hydrogeological characteristics of the proposed Development area, there are no characteristics that suggest any significant propensity toward groundwater flooding. Therefore, there are no specific mitigation measures proposed to manage groundwater flooding.

5.5 Flooding from Other Sources

The existing building site is not at risk of flooding from canals. The site is at risk of inundation in the unlikely event of a reservoir failure with normal river levels or in flood conditions. No mitigating action is deemed necessary for flood risk from these other sources.

5.6 Sequential & Exception tests

The development proposal is a change of use application, which is still classified as 'less vulnerable' according to the flood risk vulnerability classification from annex 3 of the NPPF. As it is a change of use application with only minor changes to the external elements of the development, the site is exempt from the Sequential Test¹⁸. As the site is classified as 'less vulnerable' it is appropriate for development within Flood Zone 2 (see Appendix E) and is exempt from the Exception Test.

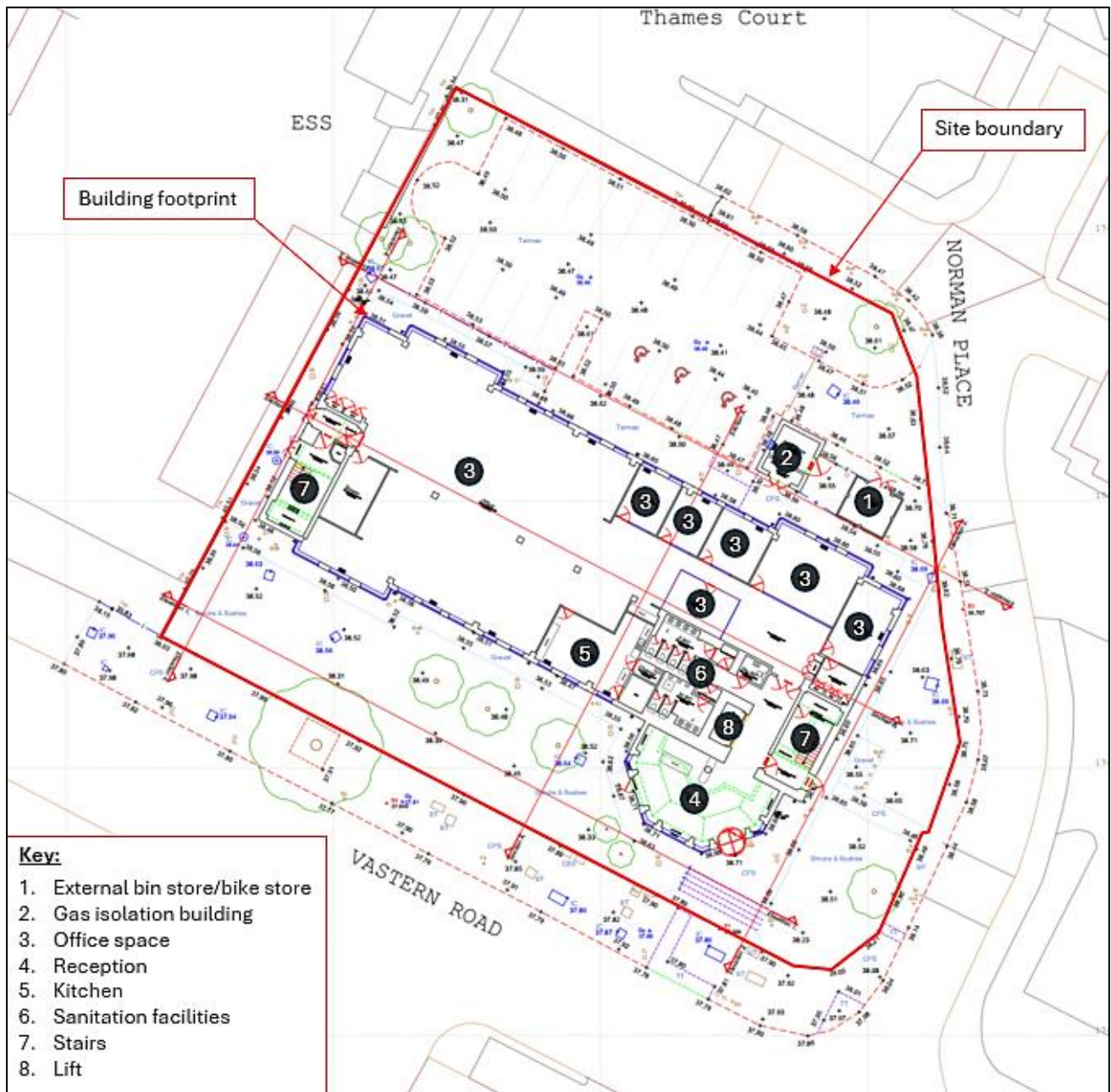
¹⁸ [National flood risk standing advice - GOV.UK](https://www.gov.uk/government/publications/national-flood-risk-standards/national-flood-risk-standards)

6. Conclusions and Recommendations

- This FRA assesses the potential flood risks to and from the existing building at Sovereign House, Reading in accordance with the NPPF.
- The EA Flood Map for Planning, and EA Risk of Flooding from Rivers and Sea map, respectively, show the proposed Development is in Flood Zone 2 and does fall within the risk of flooding from the river (and sea). However, due to existing levels of the existing building it would be recommended that no mitigation measures are required. For clarity, levels are to remain the same.
- As the development is a change of use application, it is exempt from the Sequential Test.
- The development is classed as 'less vulnerable' and therefore is exempt from the Exception Test.
- The proposed Development site is predominantly at a low or very low risk of surface water flooding, which is less than 1% or 0.1% chance each year. Climate change is expected to increase rainfall intensity, which may result in increased surface water runoff and consequently flood risk to the proposed Development site. The impacts of climate change will be managed by designing surface water storage to accommodate the predicted effects of climate change in the design life of the proposed Development, using the upper end climate change allowances for peak rainfall for the Thames and South Chilterns Management Catchment.
- A residual risk of flooding from the potential failure of artificial drainage systems within the site will always remain.

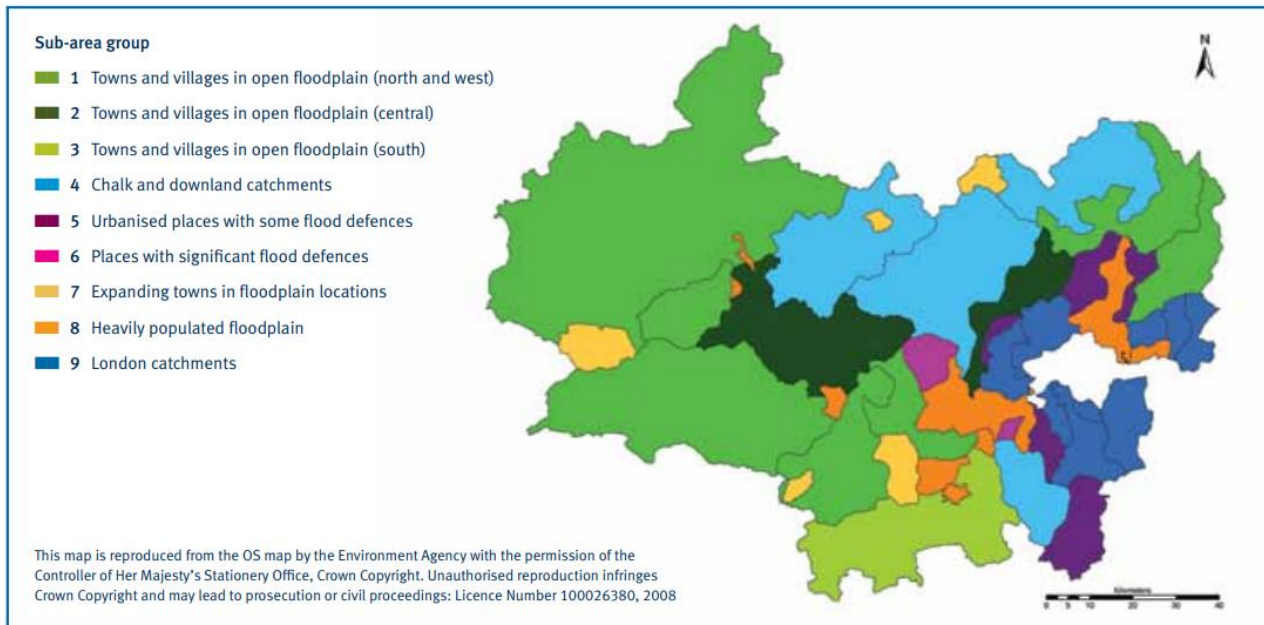
APPENDICES

Appendix A. Design of Site



Appendix B. River Thames nine sub areas¹⁹

Map 3. Sub-area grouping



¹⁹ [River Irwell Catchment Flood Management Plan.pdf \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674441/River_Irwell_Catchment_Flood_Management_Plan.pdf)

Appendix C. The six flood risk management policy options²⁰

→ Policy 1

Areas of little or no flood risk where we will continue to monitor and advise

This policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible.

→ Policy 2

Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions

This policy will tend to be applied where the overall level of risk to people and property is low to moderate. It may no longer be value for money to focus on continuing current levels of maintenance of existing defences if we can use resources to reduce risk where there are more people at higher risk. We would therefore review the flood risk management actions being taken so that they are proportionate to the level of risk.

→ Policy 3

Areas of low to moderate flood risk where we are generally managing existing flood risk effectively

This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

→ Policy 4

Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change

This policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future. In this case we would need to do more in the future to contain what would otherwise be increasing risk. Taking further action to reduce risk will require further appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

→ Policy 5

Areas of moderate to high flood risk where we can generally take further action to reduce flood risk

This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

→ Policy 6

Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits

This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off. The policy has been applied to an area (where the potential to apply the policy exists), but would only be implemented in specific locations within the area, after more detailed appraisal and consultation.

²⁰ [Thames: Catchment flood management plan - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/612212/Thames_Catchment_flood_management_plan.pdf)

Appendix D. Flood Risk Vulnerability Classification²¹

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 stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. (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”)⁵.
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. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.⁷
Less vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services,

²¹ [Technical Guidance to the National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)

Appendix E. Flood Risk Vulnerability²²

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	x	x	x

²² [Technical Guidance to the National Planning Policy Framework \(publishing.service.gov.uk\)](#)

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