



8 Lanesborough Street, Reading, Berkshire, RG2 6BS

Flood Risk Assessment

For Mr & Mrs A Chan

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July 2024

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EXECUTIVE SUMMARY

The Site would be expected to remain dry in all but the most extreme conditions. The consequences of flooding are acceptable, and the development would be in accordance with the requirements of the National Planning Policy Framework (NPPF). The Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF.

The Proposed Development should not therefore be precluded on the grounds of flood risk or drainage.

1.0 INTRODUCTION

1.1 Background

This Flood Risk Assessment (FRA) has been prepared by KRS Enviro at the request of Mr & Mrs A Chan to support a planning application for a rear single storey conservatory extension (“the Proposed Development”) at 8 Lanesborough Street, Reading, Berkshire, RG2 6BS (“the Site”).

This FRA has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)¹, associated Planning Practice Guidance on flood risk and coastal change² (PPG) and the PPG ‘Site-specific flood risk assessment checklist. This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

It is recognised that developments which are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. The development design should be such that future users will not have difficulty obtaining insurance or mortgage finance, or in selling all or part of the development, as a result of flood risk issues.

1.2 National Planning Policy Framework (NPPF)

One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.

It advises that where new development is exceptionally necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible, reduce flood risk overall. A risk-based approach is adopted at stages of the planning process, applying a source pathway receptor model to planning and flood risk. To demonstrate this, an FRA is required and should include:

- whether a Proposed Development is likely to be affected by current or future flooding from all sources;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- if necessary, provide the evidence to the Local Planning Authority (LPA) that the Sequential Test can be applied; and
- whether the development will be safe and pass part c) of the Exception Test if this is appropriate.

The report findings are based upon professional judgement and are summarised below with detailed recommendations provided at the end of the report. The report includes rainfall data from

¹ Ministry for Housing, Communities and Local Government (2023) National Planning Policy Framework: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf

² Communities and Local Government (2022) Planning Practice Guidance - Flood Risk and Coastal Change: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

the Flood Estimation Handbook (FEH) and hydrogeological information from the British Geological Survey (BGS). The assessment will summarise and refer to these datasets in the text.

1.3 Report Structure

This FRA has the following report structure:

- Section 2 describes the location and the existing and Proposed Development;
- Section 3 outlines the flood risk to the existing and Proposed Development;
- Section 4 details the proposed surface water drainage for the Site and assesses the potential impacts of the Proposed Development on surface water drainage;
- Section 5 outlines the mitigation measures used to manage the overall level of flood risk;
- Section 6 details the Sequential and Exception Tests; and
- Section 7 presents a summary and conclusions

2.0 LOCATION & DEVELOPMENT DESCRIPTION

2.1 Site Location

The Site is located at 8 Lanesborough Street, Reading, Berkshire, RG2 6BS (see Figure 1). The National Grid Reference (NGR) of the Site is 470176, 170368.

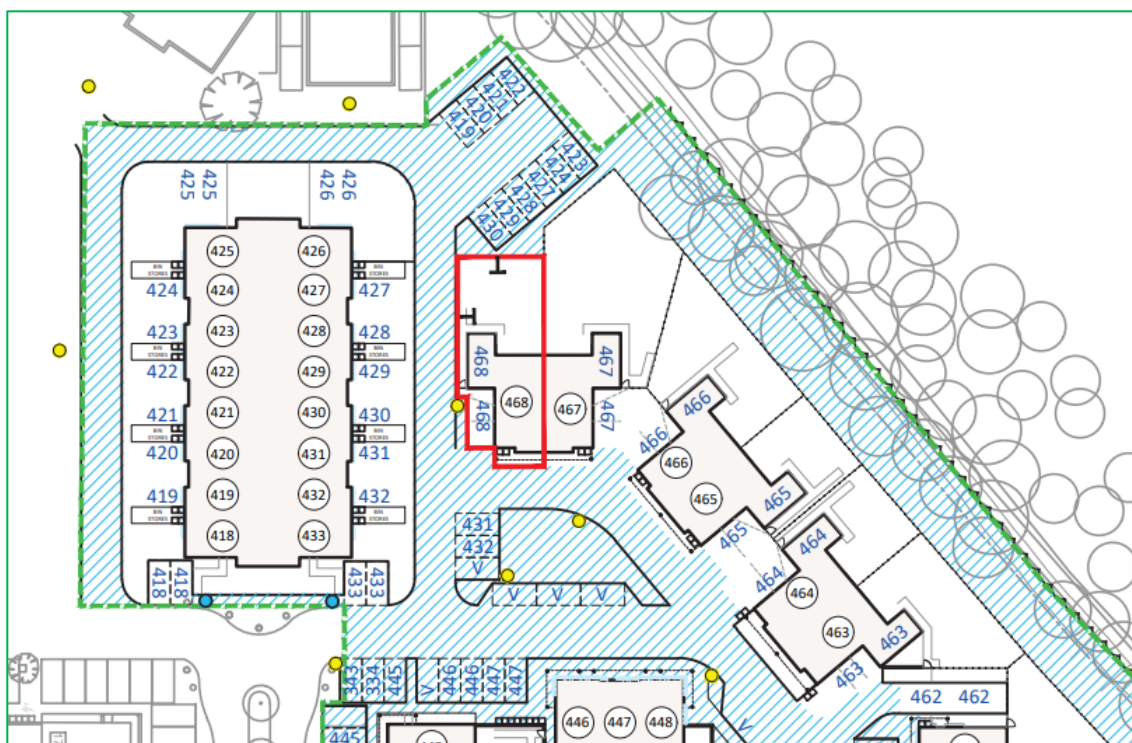


Figure 1 - Site Location

2.2 Existing Development

The existing Site consists of a semi-detached house with attached garage (see Appendix 1).

2.3 Proposed Development

The Proposed Development is for a rear single storey conservatory extension to the existing house (see Appendix 1). Further details with regard to the Proposed Development can be found in the accompanying information submitted with the planning application.

2.4 Ground Levels

The Site has an approximate ground level of 38.84 metres Above Ordnance Datum (mAOD).

2.5 Catchment Hydrology

There is a small unnamed watercourse located approximately 35m to the north of the Site which is a tributary of the River Kennett. There is a drainage ditch located approximately 160m to the south east of the Site. There are numerous ponds and lakes within the vicinity of the Site, the closest being Longwater Lake which is located approximately 220m to the south east of the Site.

The River Kennet is located approximately 680m to the north of the Site which flows in an easterly direction and ultimately discharges into the River Thames.

2.6 Ground Conditions

The British Geological Survey (BGS) map³ shows that the bedrock deposits at the Site consist of the Lambeth Group – clay, silt and sand. The superficial deposits consist of the Beenham Grange Gravel Member – sand and gravel.

Information from the National Soil Resources Institute⁴ details the Site area as being situated on loamy and clayey floodplain soils with naturally high groundwater.

³ https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.14476159.932338379.1655890995-1831306757.1655472887

⁴ <http://www.landis.org.uk/soilscapes/>

3.0 FLOOD RISK

3.1 Sources of Flooding

All sources of flooding have been considered, these are; fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial drainage systems/infrastructure failure.

3.2 Environment Agency

Information regarding the current flood risk at the application Site and local flood defences has been obtained from the Environment Agency (see Appendix 2).

3.3 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRA's. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the flood risk assessments: climate change allowances guidance⁵. Table 1 shows the peak river flow allowances by river management catchment.

The flood risk assessments: climate change allowances guidance recommends that the central allowances are used to assess climate change throughout the lifetime of the development which is 100 years. Therefore, the fluvial design event for the Site is the 1 in 100 year (+21%) event.

Table 1 - Peak River Flow Allowances by River Catchment

River Catchment	Allowance Category	2020s	2050s	2080s
Kennet and tributaries Management Catchment	Upper	+32%	+39%	+76%
	Higher	+16%	+16%	+35%
	Central	+10%	+8%	+21%

3.4 Environment Agency Flood Zones

A review of the Environment Agency's Flood Zones indicates that the Site is located within Flood Zone 2 and therefore has a 'medium probability' of flooding, as shown in Figure 2. Flood Zone 2 has a between a 1 in 100 and 1 in 1000 annual probability of river/sea flooding (1% - 0.1%) in any year

The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. They show the worst case scenario.

The Environment Agency Flood Zones and acceptable development types are explained in Table 2. Table 2 shows that most development types are generally acceptable in Flood Zone 2.

⁵ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances>

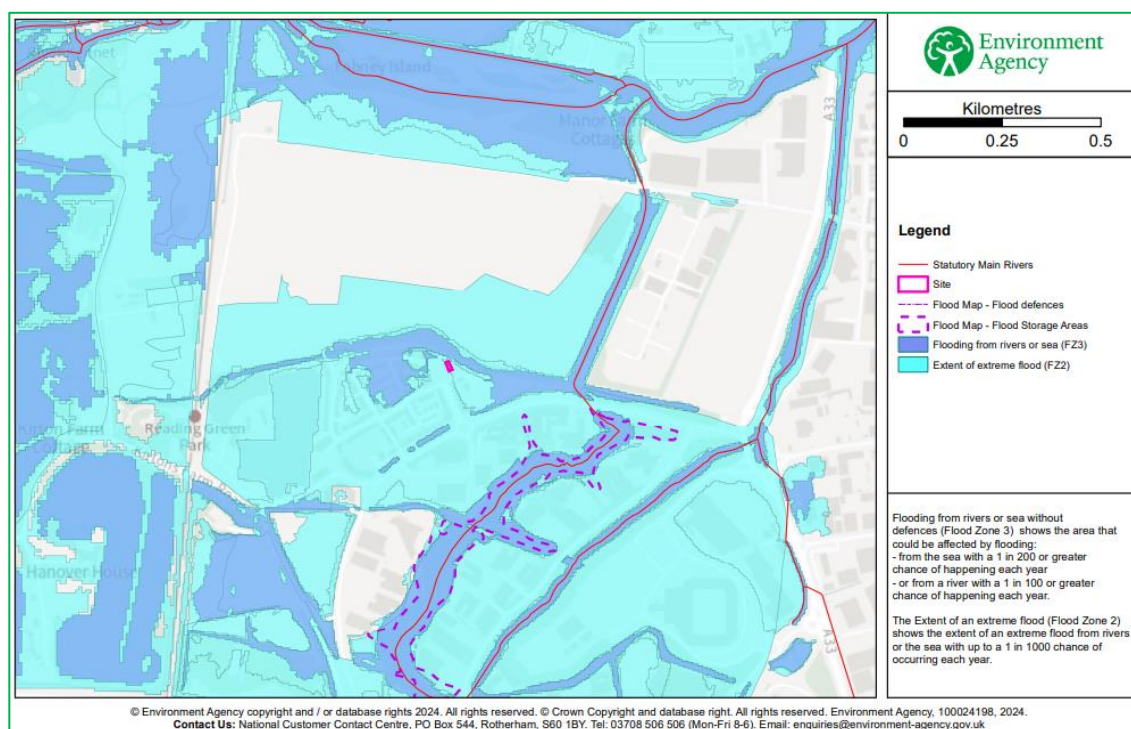


Figure 2 - Environment Agency Flood Zones

Table 2 - Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land Use
Zone 1	Low	Less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)	All development types generally acceptable
Zone 2	Medium	Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% 0.1%) in any year	Most development type are generally acceptable
Zone 3a	High	A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year	Some development types not acceptable
Zone 3b	'Functional Floodplain'	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).	Some development types not acceptable

		Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)	
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3.5 Flood Vulnerability

In the PPG appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in the PPG, the existing and proposed use is classified as 'more vulnerable'. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new 'more vulnerable' use into the floodplain.

Table 3 of this report and the PPG state that 'more vulnerable' uses are appropriate within Flood Zone 2 after the completion of a satisfactory FRA.

Table 3 - Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	✗	Exception test required	✓
Zone 3b 'Functional Floodplain'	Exception test required	✓	✗	✗	✗

Key: ✓: Development is appropriate, ✗: Development should not be permitted.

3.6 Historic Flooding

The Environment Agency records show that this area flooded in 1971 (from rivers and/or the sea) as shown in Figure 3, the channel capacity was exceeded as no raised flood defences were in place at the time. These records do not give an indication of the depth of flooding on the Site. The Environment Agency records show that the Site did not flood during the events of 1992, 1993 and 2002/03.

There are no other records of anecdotal information of flooding at the Site. The British Hydrological Society "Chronology of British Hydrological Events" has no information on flooding within the vicinity of the Site. No other historical records of flooding for the Site have been recorded.

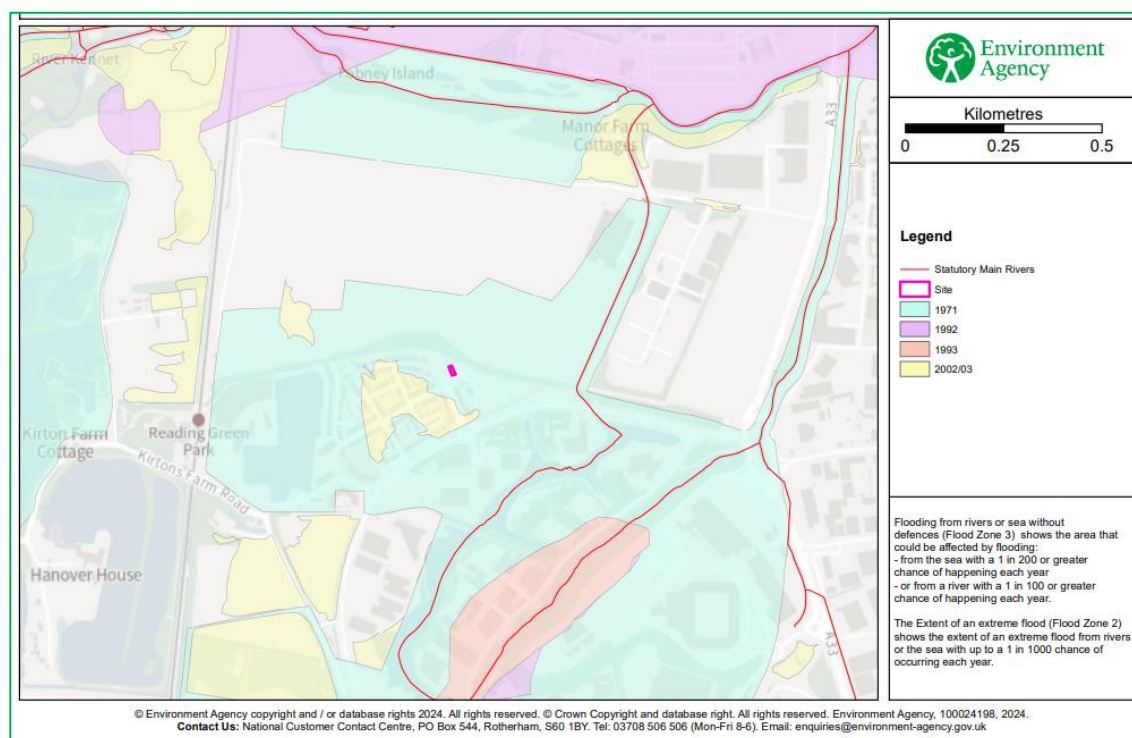


Figure 3 - Environment Agency Historic Flood Map

3.7 Existing and Planned Flood Defence Measures

The Environment Agency data shows that there are currently no flood defence measures within the vicinity of the Site. Further property level protection measures will be used to protect the Site from flooding these are discussed in Section 5.0.

3.8 Fluvial (River) Flooding

The Site is unlikely to flood except in extreme conditions. The primary, but unlikely, flood risk posed to the Site is from fluvial flooding from the small unnamed watercourse located approximately 35m to the north of the Site which is a tributary of the River Kennett which is located approximately 680m to the north of the Site.

The Environment Agency has provided modelled water levels for the Site which have been compared to the ground level of the Site and areas within the vicinity of the Site to assess the flood risk at the Site in detail. Table 4 shows the Environment Agency floodplain water levels for the Site.

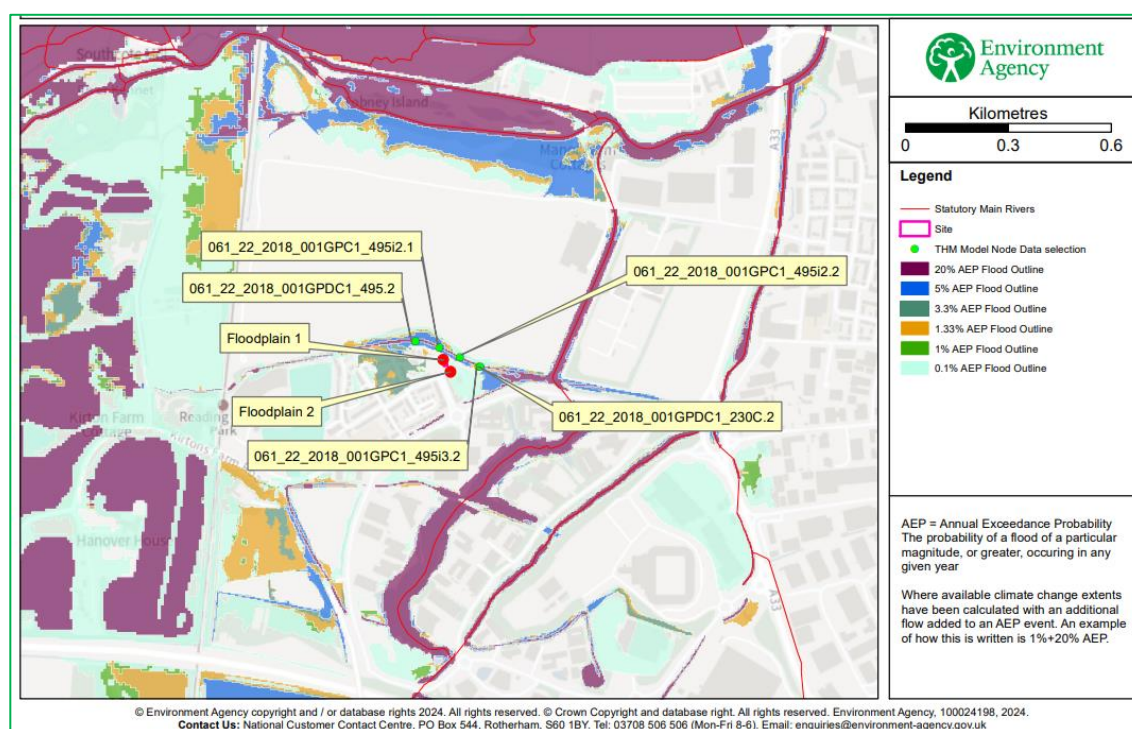
Figures 4 and 5 show the model node locations and modelled flood outlines. The Environment Agency modelled data shows that the Site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+15%) event. The Site will be flood free during the 1 in 100 year (+15%) event.

During the 1 in 100 year (+25%) the Site may be inundated with floodwater to a maximum depth of 0.25m. The 1 in 100 year (+21%) event is not available for the Site (i.e. the design event) however, during the 1 in 100 year (+21%) event, the Site may be inundated with floodwater to depths of less than 0.25m. During the 1 in 100 year (+25%) event a low hazard rating may be experienced on the Site (see Figure 6). During the 1 in 1000 year the Site may be inundated with floodwater to a maximum depth of 0.37m.

Table 4 - Environment Agency Defended Modelled Water Levels (mAOD)

Node Label	Easting	Northing	Return Period (years)					
			100	100 (+15%)	100 (+25%)	100 (+35%)	100 (+70%)	1000
Floodplain 1	470170	170377	No Data	No Data	39.09	39.15	39.36	39.21
Floodplain 2	470192	170343	No Data	No Data	No Data	39.15	39.36	39.21

*Cells which contain text 'No Data' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.

**Figure 4 - Environment Agency Model Nodes Locations and Modelled Flood Outlines**

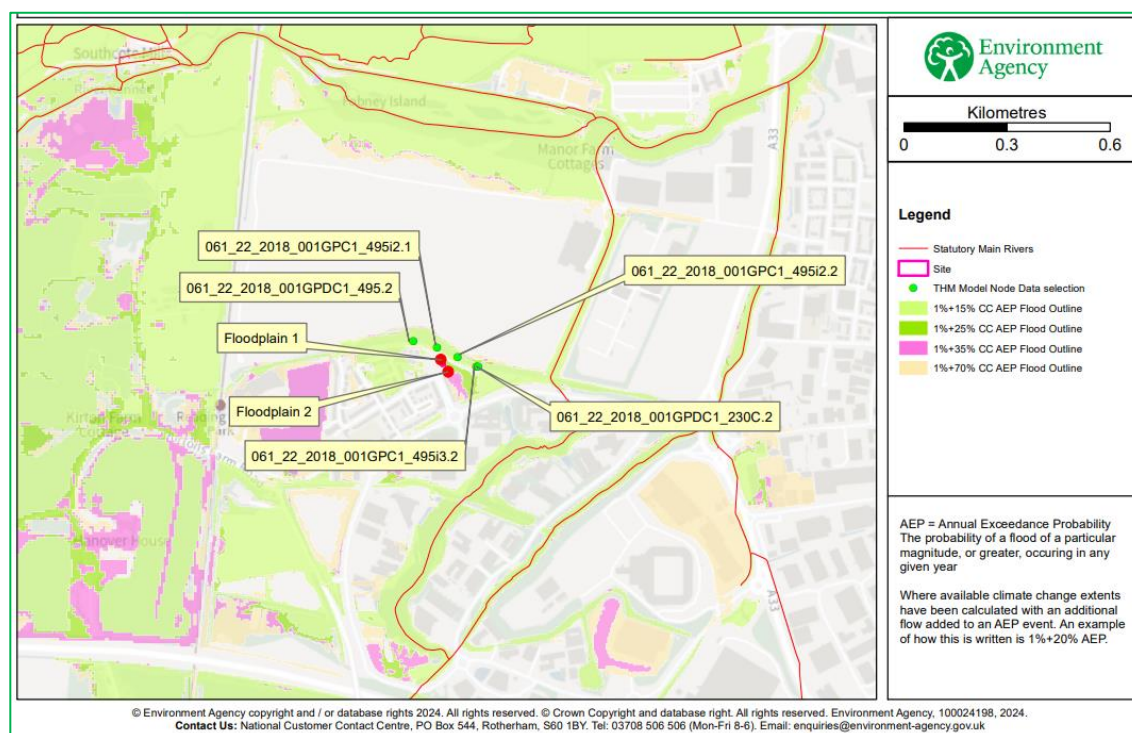


Figure 5 - Environment Agency Model Nodes Locations and Climate Change Modelled Flood Outlines

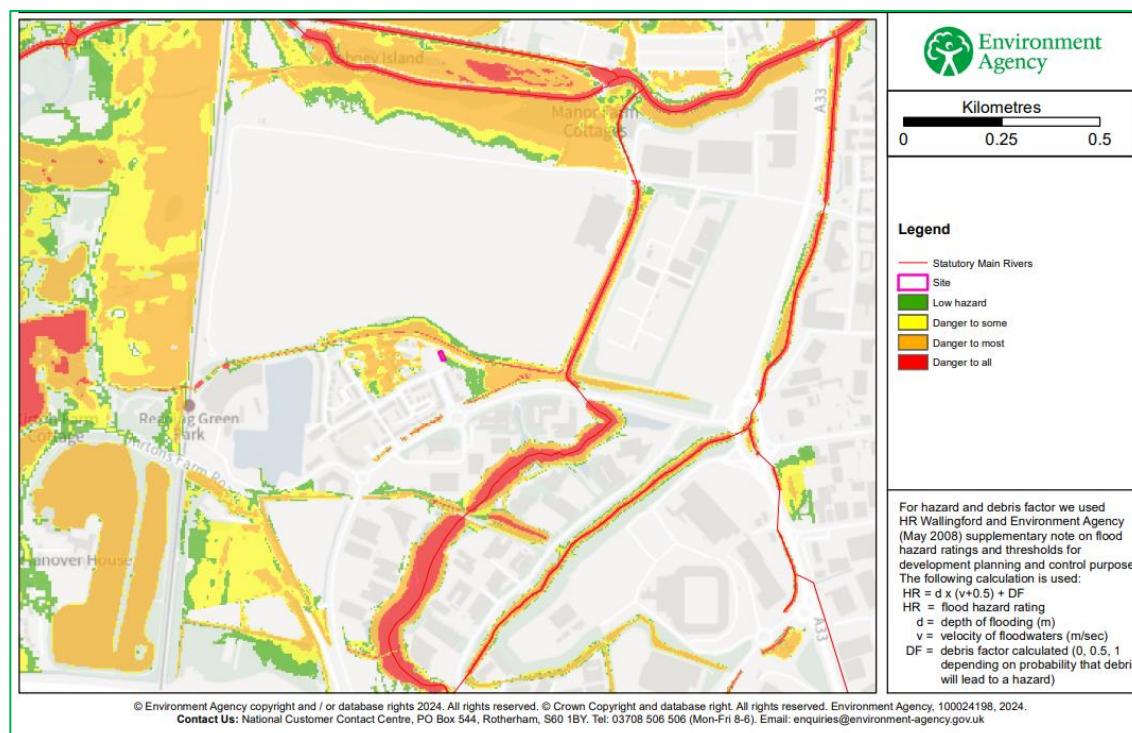


Figure 6 - Environment Agency 1 in 100 Year (+25%) Hazard Map

The mechanism for flooding at this location is generally prolonged episodes of high rainfall, which affords good time for flood warnings to be issued. The likelihood of a rapid water level rise and possible rapid inundation of urban areas posing a risk to life is considered to be minimal with a forewarning of two (2) days of a pending flood event.

The Site is located within a low risk area where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2.

The Site is one of the last places in the area to flood and remains flood free when other areas are flooded. The Site is at such a ground level that it would only flood in the most extreme flood events; the Site will remain flood free for the vast majority of flood events during the lifetime of the Proposed Development. Fluvial flood risk to the Site can be considered to be limited. Any overbank flow would follow the contours of the surrounding area and would flow away from the Site rather than flowing towards the Site.

Given the scale and nature of the Proposed Development and the size and location of the fluvial flooding sources it has been concluded that fluvial flooding poses a medium flood risk to the Site. Therefore, the risk of fluvial flooding is considered to be of **medium significance**. The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the Site (see Section 5.0).

3.9 Tidal (Coastal) Flooding

The Site is not located within the vicinity of tidal flooding sources and the risk of tidal flooding is considered to be **not significant**.

3.10 Groundwater Flooding

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers). Site ground conditions suggest a low potential for groundwater flooding. Environment Agency data confirms that flooding from groundwater is unlikely in this area. The risk of flooding from groundwater flooding is considered to be **not significant**.

3.11 Surface Water (Pluvial) Flooding

The Site is not situated near to large areas of poor permeability or areas with the geology and/or topography which may result in surface water flooding. The Site surroundings are relatively flat and there are no large catchments that would tend to generate surface water runoff towards the Site. Surface water flow flooding tends to occur sporadically in both location and time such surface water flows would tend to be confined to the streets around the development.

The Environment Agency Surface Water flood map shows that the Site has a low risk of surface water flooding with an annual probability of flooding of between a 1 in 1000 (0.1%) to a 1 in 100 (1%) chance of flooding (see Figure 7). Therefore, the risk of flooding from surface water flooding is considered to be of **low significance**. The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall risk at the Site (see Section 5.0).



Figure 7 - Environment Agency Surface Water Flood Map

3.12 Sewer Flooding

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

There are existing sewers located within the vicinity of the Site and these will inevitably have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains, but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment.

Given the design parameters normally used for drainage design in recent times and allowing for some deterioration in the performance of the installed systems, which are likely to have been in place for many years, an appropriate flood risk probability from this source could be assumed to have a return period in the order of 1 in 10 to 1 in 20 years. The provision of adequate level difference between the ground floors and adjacent ground level would reduce the annual probability of damage to property from this source to 1 in 100 years or less. Therefore, the risk of flooding from sewer flooding is considered to be **not significant**.

3.13 Flooding from Artificial Drainage Systems/Infrastructure Failure

There are no other nearby artificial water bodies, water channels and artificial drainage systems that could be considered to pose a flood risk to the Site. The Environment Agency Reservoir flood map shows that the Site is not at risk of reservoir flooding (see Figure 8). The risk of flooding from flooding from artificial drainage systems/infrastructure failure is considered to be **not significant**.

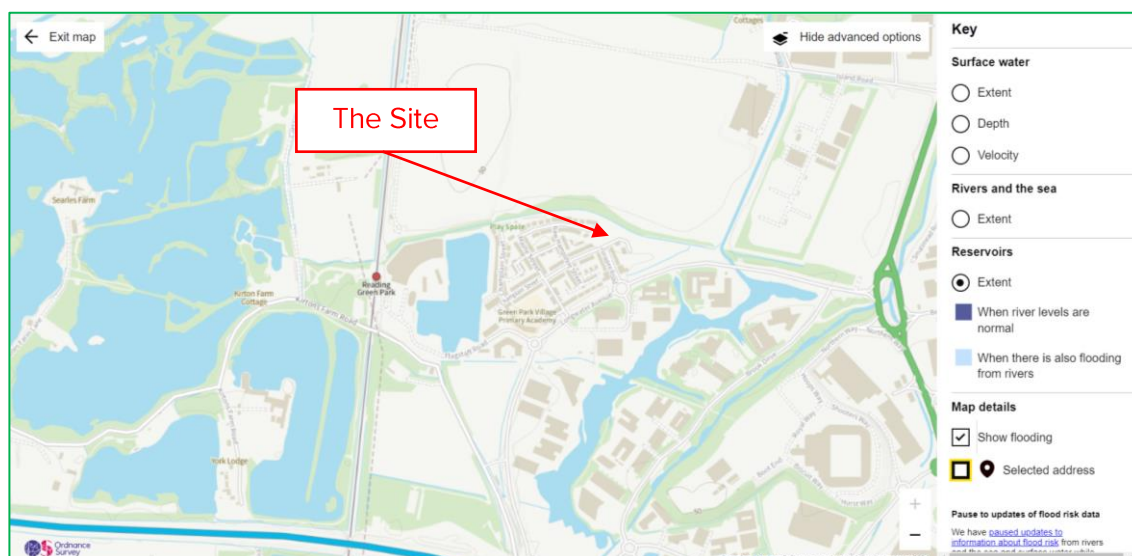


Figure 8 - Environment Agency Reservoir Flood Map

3.14 The Effect of the Development on Flood Risk

No land raising will occur within the Site therefore, the Proposed Development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed Site and surrounding area. There will no net loss in flood storage capacity. The conveyance routes (flow paths) will not be blocked or obstructed.

There will be no detriment to the flood storage capacity of the Site. There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk.

3.15 Summary of Site Specific Flood Risk

A summary of the sources of flooding and a review of the risk posed by each source at the Site is shown in Table 5.

Table 5 - Risk Posed by Flooding Sources

Sources of Flooding	Potential Flood Risk	Potential Source	Probability/Significance
Fluvial Flooding	Yes	Unnamed Watercourse	Medium
Tidal Flooding	No	None Reported	None
Groundwater Flooding	No	None Reported	None
Surface Water Flooding	Yes	Low Spots/Poor Permeability	Low
Sewer Flooding	No	None Reported	None
Flooding from Artificial Drainage Systems/Infrastructure Failure	No	None Reported	None

The Site is unlikely to flood except in extreme conditions. The primary, but unlikely, flood risk posed to the Site is from fluvial flooding sources. The Site is located within Flood Zone 2 and therefore has a 'medium probability' of flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

The existing and proposed use is classified as 'more vulnerable'. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new 'more vulnerable' use into the floodplain. 'More vulnerable' uses are appropriate within Flood Zone 2 after the completion of a satisfactory FRA.

The Environment Agency modelled data shows that the Site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+15%) event. The Site will be flood free during the 1 in 100 year (+15%) event.

During the 1 in 100 year (+25%) the Site may be inundated with floodwater to a maximum depth of 0.25m. The 1 in 100 year (+21%) event is not available for the Site (i.e. the design event) however, during the 1 in 100 year (+21%) event, the Site may be inundated with floodwater to depths of less than 0.25m. During the 1 in 100 year (+25%) event a low hazard rating may be experienced on the Site. During the 1 in 1000 year the Site may be inundated with floodwater to a maximum depth of 0.37m.

Given the scale and nature of the Proposed Development and the size and location of the fluvial flooding sources it has been concluded that fluvial flooding poses a low flood risk to the Site. Therefore, the risk of fluvial flooding is considered to be of **medium significance**. A secondary flooding source has been identified which may pose a **low significant** risk to the Site. This is:

- Surface Water Flooding

The risk from all sources will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the Site (see Section 5.0).

No land raising will occur within the Site therefore, the Proposed Development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed Site and surrounding area. There will be no net loss in flood storage capacity. The conveyance routes (flow paths) will not be blocked or obstructed.

There will be no detriment to the flood storage capacity of the Site. There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk.

4.0 SURFACE WATER DRAINAGE

4.1 Surface Water Management Overview

It is recognised that consideration of flood issues should not be confined to the floodplain. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. For example, replacing vegetated areas with roofs, roads and other paved areas can increase both the total and the peak flow of surface water runoff from the Site. Changes of land use on previously developed land can also have significant downstream impacts where the existing drainage system may not have sufficient capacity for the additional drainage.

An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the Site. The assessment considers the impact of the proposals compared to current conditions. Therefore, the surface water attenuation requirement for the developed Site can be determined and reviewed against existing arrangements.

The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the Proposed Development unless specific off-site arrangements are made and result in the same net effect.

4.2 Surface Water Runoff Rates/Volumes

The Proposed Development will not alter the impermeable areas of the Site. It is understood that the existing drainage infrastructure at the Site efficiently and effectively manages surface water runoff generated at the Site. As there is no recent history of surface water flooding at the Site it is likely that the current drainage system is sufficient for the current and proposed Site use. There will be no increase in surface water runoff or exacerbation of off-site risk as a result of the development.

5.0 RISK MANAGEMENT

5.1 Introduction

The flood risk at this location is considered suitable for the Proposed Development within the NPPF. In this flood zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the use of flood mitigation measures.

The flooding sources will be mitigated on the Site by using a number of techniques, and mitigation strategies to manage and reduce the overall flood risk at the Site. This will ensure the development will be safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the Proposed Development on flood risk generally; and;
- Minimal disruption to natural heritage.

The flood risk at the Site will be reduced by mitigation measures; these are discussed in more detail below.

5.2 Finished Floor Levels

It is proposed that the finished floor levels of the conservatory extension will be set no lower than the finished floor levels. It is recognised however that owing to limited headroom constraints, massing, planning policy and Building Regulations it is considered impractical to raise the finished floor levels further, than those stated above. Therefore, in order to mitigate against this, it is recommended that the occupants implement a Flood Plan to a safe area away from the building during times of flood and sign up to the Environment Agency flood warning telephone service.

It is also proposed that flood protection measures are employed within the building design to reduce the overall risk to the occupants. This is discussed below.

5.3 First Floor Accommodation

Accommodation will be located on the first floor as well as the ground floor of the house. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor are located well above any floodwater levels. This provides a 'safe haven' above any floodwater levels. This will enable rapid escape should flooding occur which is unlikely.

The upper floors are accessed via internal stairs and are sufficient in size to safely house all occupants of the building. The 'safe haven' will only be required in very extreme events or if a flood warning has not been received.

5.4 Flood Resistance

The Flood risk can be mitigated through the design of the extensions. Flood resistance measures are measures that help resist floodwaters entering a property (airbrick covers are an example of a flood resistance measure). Flood resistant measures will be used, including:

- The walls of the extension will be thick.
- Sealant will be used around all external doors and windows.
- All windows will be located above ground levels.
- All external doors and windows are constructed from hard wearing materials.

These factors will prevent water entering the property and make the property more resistant to seepage.

5.5 Flood Resilience

Flood resilience measures are designed in such a way as to reduce the cost and time required to reinstate the property should it be flooded (tiled floors are an example of a flood resilience measure).

The property will be constructed in such a way that although floodwater may enter the building, elements that are damaged by flood water can be easily repaired or replaced. This is a form of flood resilience. They are suitable as no other measure is practicable. Robust materials and finishes will be used.

All electrics wiring, switches, sockets, socket outlets etc. to be located a minimum of 450mm above the finished floor levels. A proprietary damp-proof membrane system will be used that is bonded to the slab rather than below the insulation and installed in accordance with the manufacturer's requirements will be used.

Fixings will be galvanized/stainless steel/copper (no mild steel to be used - cause rust/staining or walls). Hardcore and binding will have good compaction to reduce the risk of settlement and consequential cracking.

5.6 Flood Warning and Evacuation

The Site is located within the vicinity of a flood risk area; the Site will participate in the Environment Agency flood warning telephone service. The Site will register contact details with the Environment Agency's Flood Warnings Service (Floodline 0845 988 1188) in order to receive Flood Warnings. The Environment Agency operate a free flood warning service providing alerts by phone, text or email when flooding is anticipated providing an opportunity for home owners to take necessary precautions, giving enough time for the building to be safely evacuated and mitigation measures to be put in place.

All occupants/visitors of the Site will be made aware of the Environment Agency Floodline telephone number (Call Floodline on 0345 988 1188 or 0845 988 1188 to get more information) and the three Flood Warning Codes and their meaning. The owner of the Site will carry out the role of Flood Warden for the Site and ensure they have an understanding of the flood mechanisms of the Site and will ensure that the safety of the occupants and visitors will not be compromised.

The Environment Agency uses three Flood Warnings Codes. They can be issued in any order, usually ending with an 'all clear'. They are issued by the Environment Agency through their website and Floodline Warning Service. The flood warning will be passed onto the occupier/visitors of the Site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

5.7 Flood Plan

A Flood Plan outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed. Sensible

precautions would include raising electrical items, moving valuable items off the ground or where possible moving them to a higher floor, rolling up carpets and rugs and turning off utilities. In addition, consider what actions you would take should the property need to be evacuated including access and egress routes and preparing a flood kit in advance containing warm clothing, medication, a torch, food and wellingtons.

The Flood Plan is a 'living' document and therefore should be periodically reviewed and updated to provide advice and guidance to occupants in the event of an extreme flood. The Flood Plan will therefore reduce the vulnerability of the occupants to flooding and makes them aware of the mechanisms of flooding at the Site.

Residual Risk

If flooding starts to affect the Site without any pre-warning i.e. in real time (e.g. through a failure of the flood warning delivery) the following actions will be taken:

- Occupants and visitors should consider evacuating the Site.
- If flood levels continue to rise, occupants and visitors are advised to evacuate before safe access is lost. Occupants and visitors should monitor the flood progression and evacuate.

The Flood Warden will monitor flood levels and keep occupants and visitors informed and will decide whether to initiate the Flood Plan. If required a 'safe haven' can also be maintained and may be required in very extreme events if a flood warning has not been received.

5.8 Safe Access and Egress Route

The NPPF requires that, where required, safe access and escape is available to/from new developments in flood risk areas. Access routes should be such that occupants can safely access and exit their houses in design flood conditions. These routes must also provide the emergency services with access to the development during a flood event and enable flood defence authorities to carry out any necessary duties during the period of flood.

The Site is at such a ground level that it would only flood in the most extreme flood event. The Site is located where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2. The ground levels rise to the east of the Site with the water depths decreasing rapidly therefore, a safe access and egress route, including emergency access can be maintained for vehicles and/or by foot.

Facilities such as community centres, shops etc. are located to the east of the Site. There may also be large areas than those shown in Figure 2 that are flood free located nearer and within the vicinity of the Site. In the event of a flood warning, vital belongings, including waterproof clothing, necessary medication and essentials for infants and children will be collected. It should be ensured that all occupiers and visitors to the Site are accounted for, and then exit the Site using the routes shown in Figure 9.

The Safe Access and Egress Route shown in Figure 9 indicates the exit routes that all people (i.e. occupants and visitors) on Site should follow once a flood warning has been received. People should make their way to areas outside of the flood zone. Therefore, safe access and egress can be maintained in accordance with the NPPF and Environment Agency guidance.

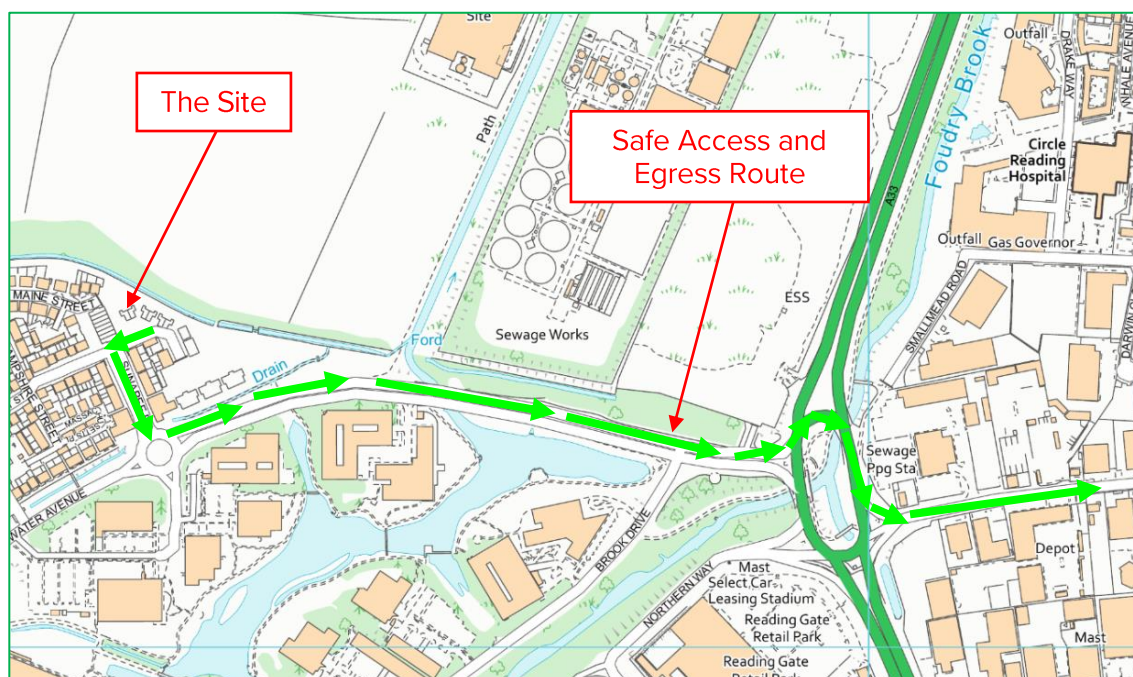


Figure 9 - Safe Access and Egress Route

5.9 Flooding Consequences

The mitigation measures detailed above show that the flood risk can be effectively managed and therefore the consequences of flooding are acceptable. The Site is unlikely to flood except in extreme conditions. This takes into account the property level protection measures.

6.0 SEQUENTIAL APPROACH

6.1 Sequential/Exception Tests

The risk-based Sequential Test in accordance with the NPPF aims to steer new development to areas at the lowest probability of flooding (i.e. Flood Zone 1). However, paragraph 174 of the NPPF confirms that: *'Applications for some minor development and changes of use⁶ should not be subject to the Sequential or Exception Tests but should still meet the requirements for site-specific flood risk assessments'*.

The development proposals should therefore be considered by the LPA to satisfy the Sequential and Exception Tests as set out in the NPPF.

⁶ This includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.

7.0 SUMMARY AND CONCLUSIONS

7.1 Introduction

This report presents an FRA in accordance with the NPPF for the Proposed Development at 8 Lanesborough Street, Reading, Berkshire, RG2 6BS.

This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

7.2 Flood Risk

The Site is unlikely to flood except in extreme conditions. The primary, but unlikely, flood risk posed to the Site is from fluvial flooding sources. The Site is located within Flood Zone 2 and therefore has a 'medium probability' of flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

The existing and proposed use is classified as 'more vulnerable'. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new 'more vulnerable' use into the floodplain. 'More vulnerable' uses are appropriate within Flood Zone 2 after the completion of a satisfactory FRA.

The Environment Agency modelled data shows that the Site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+15%) event. The Site will be flood free during the 1 in 100 year (+15%) event.

During the 1 in 100 year (+25%) the Site may be inundated with floodwater to a maximum depth of 0.25m. The 1 in 100 year (+21%) event is not available for the Site (i.e. the design event) however, during the 1 in 100 year (+21%) event, the Site may be inundated with floodwater to depths of less than 0.25m. During the 1 in 100 year (+25%) event a low hazard rating may be experienced on the Site. During the 1 in 1000 year the Site may be inundated with floodwater to a maximum depth of 0.37m.

Given the scale and nature of the Proposed Development and the size and location of the fluvial flooding sources it has been concluded that fluvial flooding poses a low flood risk to the Site. Therefore, the risk of fluvial flooding is considered to be of **medium significance**. A secondary flooding source has been identified which may pose a **low significant** risk to the Site. This is:

- Surface Water Flooding

The risk from all sources will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the Site.

No land raising will occur within the Site therefore, the Proposed Development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed Site and surrounding area. There will no net loss in flood storage capacity. The conveyance routes (flow paths) will not be blocked or obstructed.

There will be no detriment to the flood storage capacity of the Site. There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk.

7.3 Surface Water Drainage

The Proposed Development will not alter the impermeable areas of the Site. It is understood that the existing drainage infrastructure at the Site efficiently and effectively manages surface water runoff generated at the Site. As there is no recent history of surface water flooding at the Site it is likely that the current drainage system is sufficient for the current and proposed Site use. There will be no increase in surface water runoff or exacerbation of off-site risk as a result of the development.

7.4 Risk Management

The flood risk at the Site will be reduced by mitigation measures, discussed below.

Finished Floor Levels: It is proposed that the finished floor levels of the conservatory extension will be set no lower than the finished floor levels. It is recognised however that owing to limited headroom constraints, massing, planning policy and Building Regulations it is considered impractical to raise the finished floor levels further, than those stated above. Therefore, in order to mitigate against this, it is recommended that the occupants implement a Flood Plan to a safe area away from the building during times of flood and sign up to the Environment Agency flood warning telephone service.

It is also proposed that flood protection measures are employed within the building design to reduce the overall risk to the occupants. This is discussed below.

First Floor Accommodation: Accommodation will be located on the first floor as well as the ground floor of the house. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor are located well above any floodwater levels. This provides a 'safe haven' above any floodwater levels. This will enable rapid escape should flooding occur which is unlikely.

The upper floors are accessed via internal stairs and are sufficient in size to safely house all occupants of the building. The 'safe haven' will only be required in very extreme events or if a flood warning has not been received.

Flood Resistance Measures: Flood resistant measures will be used, including:

- The walls of the extension will be thick.
- Sealant will be used around all external doors and windows.
- All windows will be located above ground levels.
- All external doors and windows are constructed from hard wearing materials.

These factors will prevent water entering the property and make the property more resistant to seepage.

Flood Resilience Measures: All electrics wiring, switches, sockets, socket outlets etc. to be located a minimum of 450mm above the finished floor levels. A proprietary damp-proof membrane system will be used that is bonded to the slab rather than below the insulation and installed in accordance with the manufacturer's requirements will be used.

Fixings will be galvanized/stainless steel/copper (no mild steel to be used - cause rust/staining or walls). Hardcore and binding will have good compaction to reduce the risk of settlement and consequential cracking.

Flood Warning and Evacuation: The Site is located within the vicinity of a flood risk area therefore; the Site will participate in the Environment Agency flood warning telephone service. The Site will register contact details with the Environment Agency' Flood Warnings Service (Floodline 0845 988 1188) in order to receive Flood Warnings.

Flood Plan: A Flood Plan outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed.

Safe Access and Egress Route: The Site is at such a ground level that it would only flood in the most extreme flood event. The Site is located where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2. The ground levels rise to the east of the Site with the water depths decreasing rapidly therefore, a safe access and egress route, including emergency access can be maintained for vehicles and/or by foot.

Facilities such as community centres, shops etc. are located to the east of the Site. In the event of a flood warning, vital belongings, including waterproof clothing, necessary medication and essentials for infants and children will be collected. It should be ensured that all occupiers and visitors to the Site are accounted for, and then exit the Site.

The Safe Access and Egress Route indicates the exit routes that all people (i.e. occupants and visitors) on Site should follow once a flood warning has been received. People should make their way to areas outside of the flood zone. Therefore, safe access and egress can be maintained in accordance with the NPPF and Environment Agency guidance.

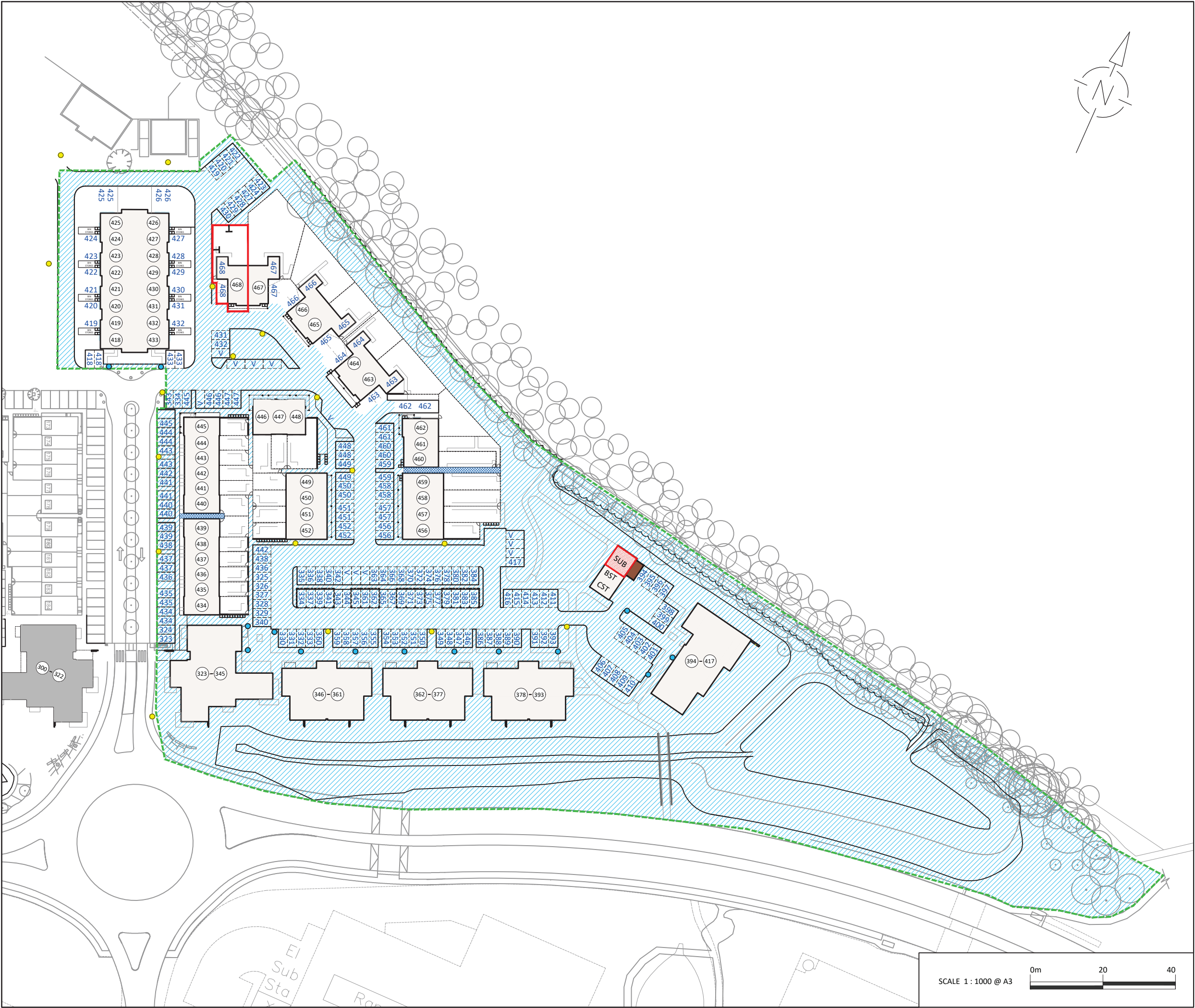
7.5 Conclusion

In conclusion, the Proposed Development, would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this FRA are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable and the development would be in accordance with the requirements of the NPPF.

This FRA demonstrates that the Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk

APPENDICES

APPENDIX 1 – Existing and Proposed Site Layout



S07.1.AA3 Revision 1.0 – 12.11.13

Legend	
Key	Description
	Indicates Extent of Management Company Responsibility
	Indicates Shared Rights of Access
	Extent of Plot/Block Ownership
	T-Mark Denoting Boundary Ownership
	Plot Number
	Lighting Column Maintained by Management Company
	Lighting Bollard Maintained by Management Company
	Phase Boundary
	Indicates parking space to be maintained by the Management Company but with exclusive rights of use by the occupant
	Bin Store
	Cycle Store
	Sub Station & Rights

P2	12.04.24	EXTENT OF PLOT OWNERSHIP UPDATED	SD	MPG	TJS
P1	08.07.19	FIRST ISSUE	OJG	MPG	TJS
Rev.	Date	Description	Drawn	Checked	Approved

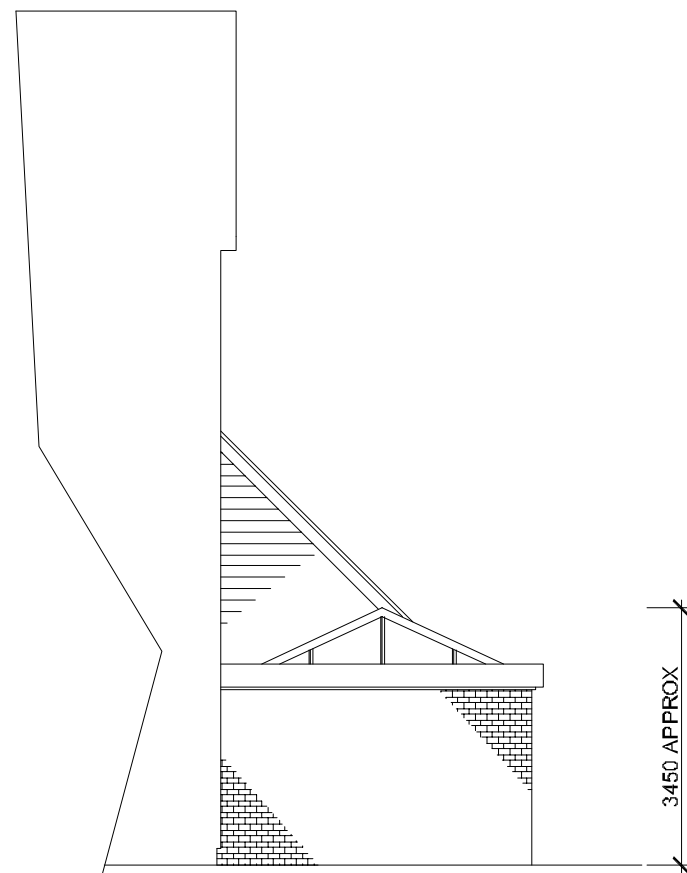


Designed for life

GREEN PARK VILLAGE, PHASE 3B

CONVEYANCE PLAN - PLOT 468

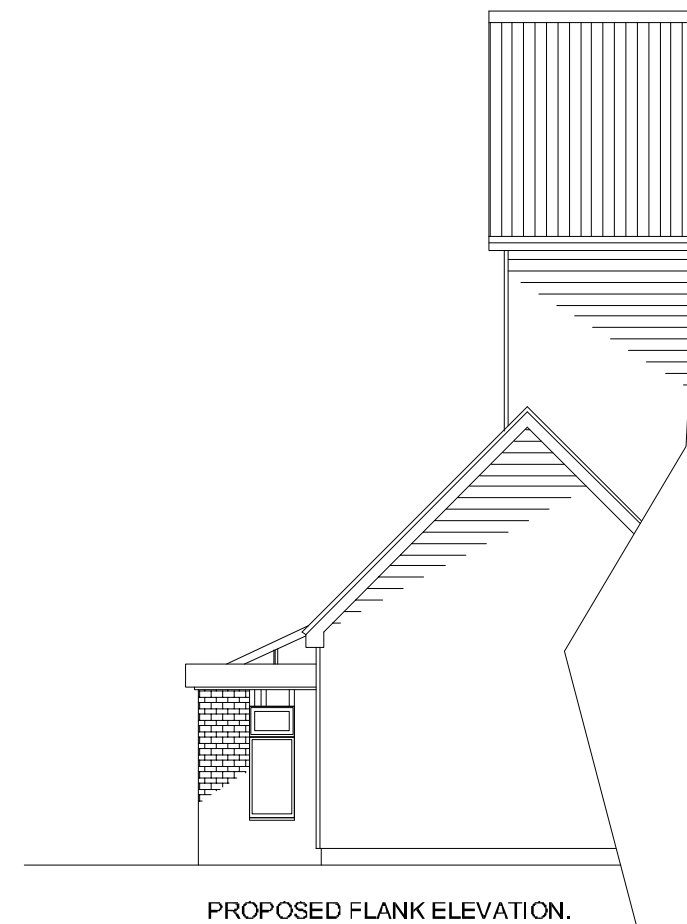
Drawing No: 4940-CON468 Revision: P2



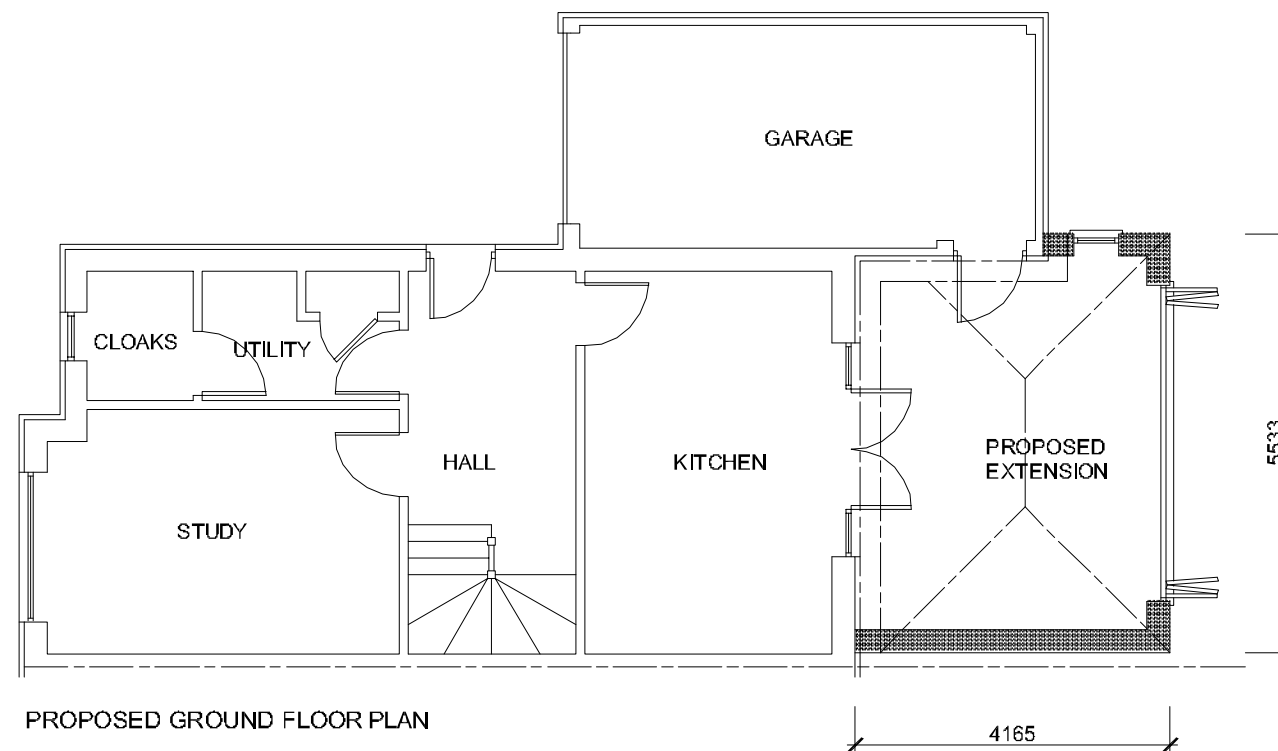
PROPOSED FLANK ELEVATION.



PROPOSED REAR ELEVATION.



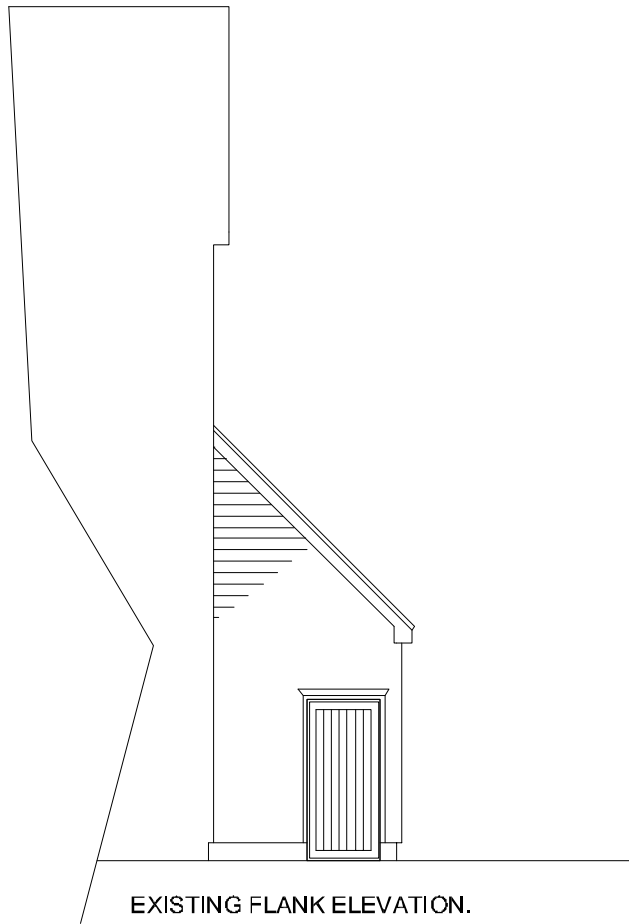
PROPOSED FLANK ELEVATION.



PROPOSED GROUND FLOOR PLAN

SPECIFICATION NOTES.
ROOF TO BE BLACK ON WHITE ALUMINIUM
ROOF BARS SUPPORTING BLUE TINTED
GLASS PANELS.
ELEVATIONS TO BE FACE BRICKWORK TO
MATCH LOW LEVEL BRICKWORK ON
EXISTING PROPERTY.
NEW WINDOWS DOORS TO BE BLACK ON
WHITE ALUMINIUM WITH CLEAR GLASS
PANELS.

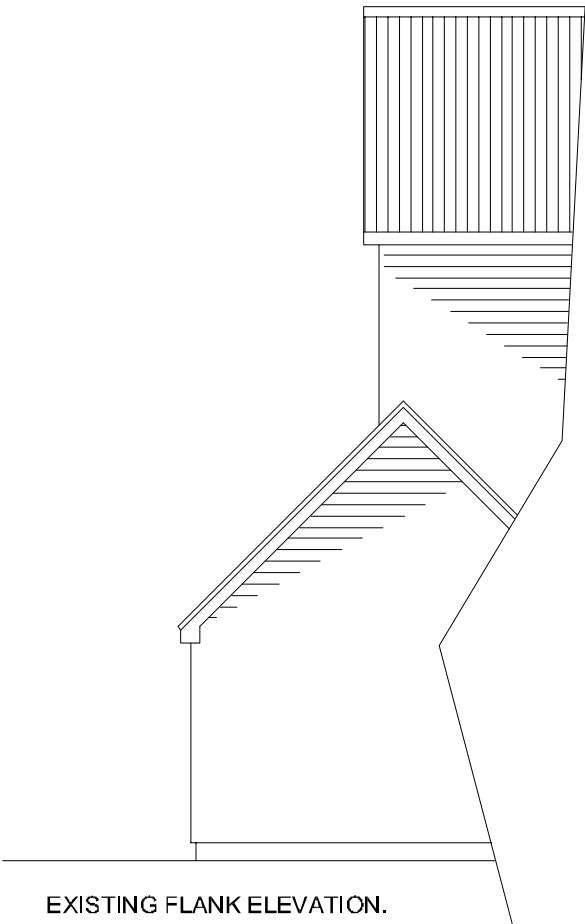




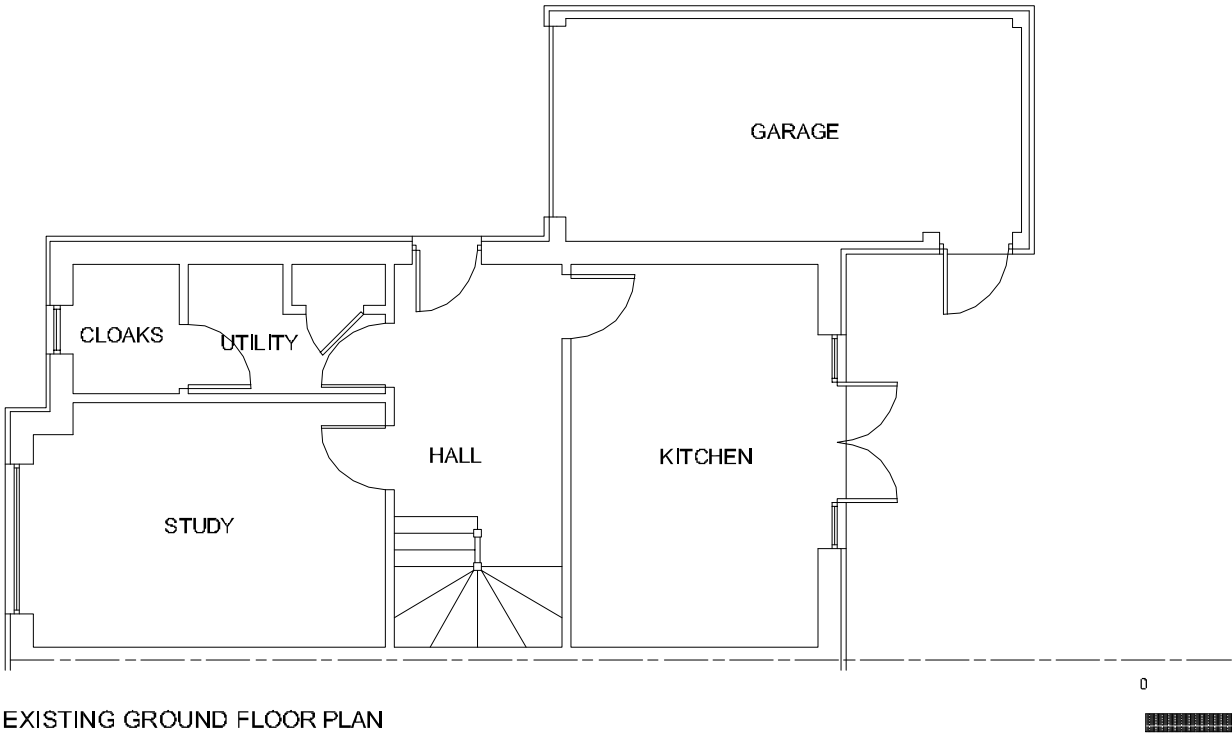
EXISTING FLANK ELEVATION.



EXISTING REAR ELEVATION.



EXISTING FLANK ELEVATION.



EXISTING GROUND FLOOR PLAN



PROJECT
PROPOSED CONSERVATORY EXTENSION TO
REAR ELEVATION.

CLIENT MR & MRS A. CHAN.

SITE ADDRESS
8 LANESBOROUGH STREET, READING, RG2 6BS

CONTENT EXISTING FLOOR PLAN & ELEVATIONS

DATE
MAY 2024

SCALE
1-100 @ A3

APPENDIX 2 – Environment Agency Data

Product 4 (Detailed Flood Risk) for 8 Laneborough Street, Reading, Berkshire, RG2 6BS

Our Ref: THM362348

Product 4 is designed for developers where Flood Risk Standing Advice FRA (Flood Risk Assessment) Guidance Note 3 Applies. This is:

- i) "all applications in Flood Zone 3, other than non-domestic extensions less than 250 sq metres; and all domestic extensions", and
- ii) "all applications with a site area greater than 1 ha" in Flood Zone 2.

Product 4 includes the following information:

Ordnance Survey 1:25k colour raster base mapping;
Flood Zone 2 and Flood Zone 3;
Relevant model node locations and unique identifiers (for cross referencing to the water levels, depths and flows table);
Model extents showing *defended* scenarios;
FRA site boundary (where a suitable GIS layer is supplied);
Flood defence locations (where available/relevant) and unique identifiers; (supplied separately)
Flood Map flood storage areas (where available/relevant);
Historic flood events outlines (where available/relevant, not the Historic Flood Map) and unique identifiers;

Statutory (Sealed) Main River (where available within map extents);

A table showing:

- i) Model node X/Y coordinate locations, unique identifiers, and levels and flows for *defended* scenarios.
- ii) Flood defence locations unique identifiers and attributes; (supplied separately)
- iii) Historic flood events outlines unique identifiers and attributes; and
- iv) Local flood history data (where available/relevant).

Please note:

If you will be carrying out computer modelling as part of your Flood Risk Assessment, please request our guidance which sets out the requirements and best practice for computer river modelling.

This information is based on that currently available as of the date of this letter. You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

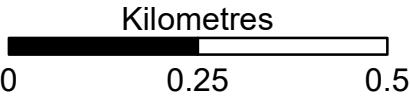
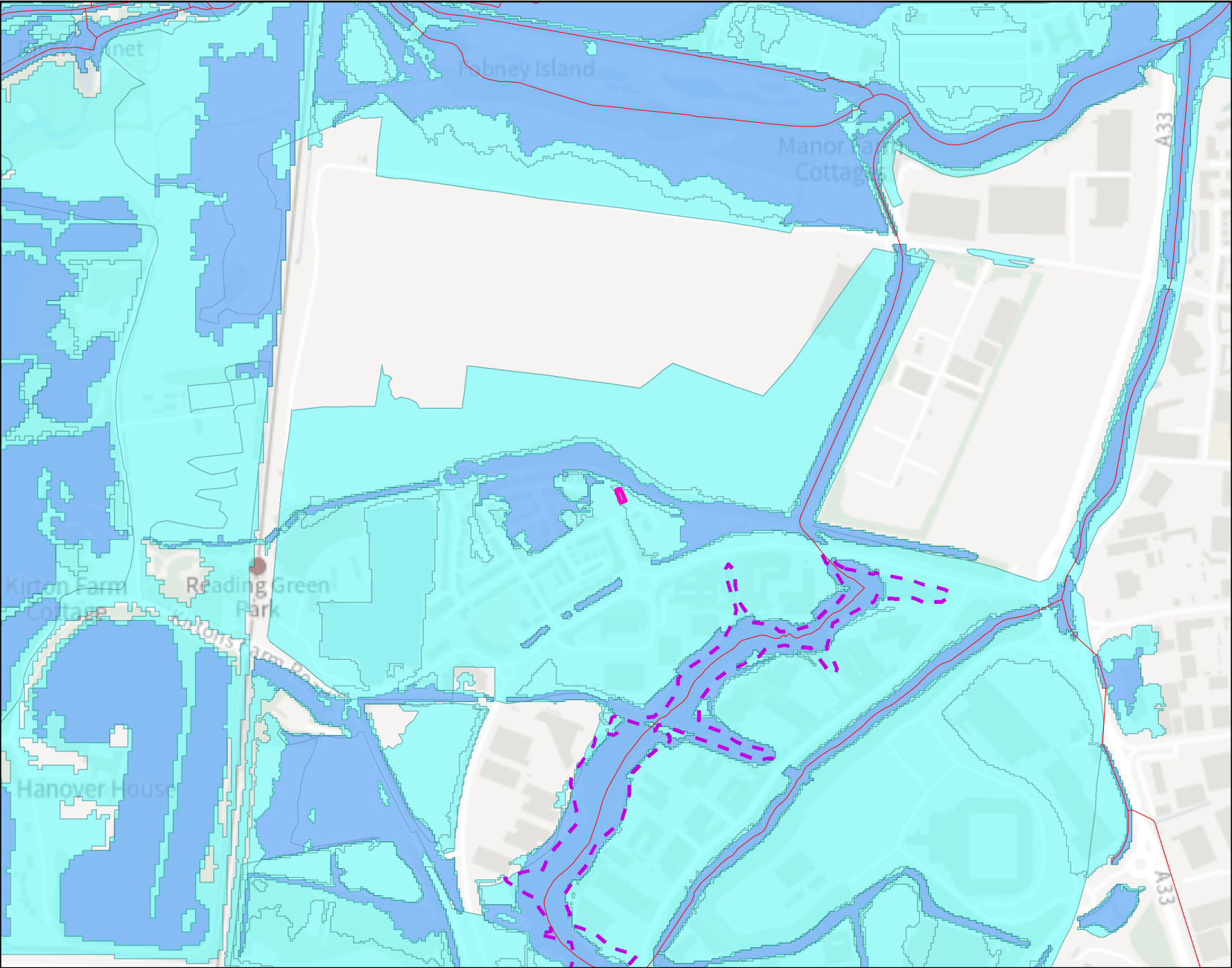
This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Detailed flood map for planning centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS
Created on 10/06/24 REF: THM362348



Legend

- Statutory Main Rivers
- Site
- Flood Map - Flood defences
- Flood Map - Flood Storage Areas
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Defence information

Defence Location: No defences on Main River

Description: This location is not currently protected by any formal defences and we do not currently have any flood alleviation works planned for the area. However we continue to maintain certain watercourses and the schedule of these can be found on our internet pages.

Model information

THM362348

Model: **Kennet (Tyle Mill to Thames Confluence) 2018**

Description: The information provided is taken from the Kennet (Tyle Mill to Thames confluence) 2018. The study was carried out using 1D-2D modelling software (Flood modeller-Tuflow).

Model design runs:

1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 30/ 3.3% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP; 1 in 100+15% / 1% + 15% AEP with climate change; 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; and 1 in 1000 / 0.1% AEP.

Mapped Outputs:

1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 30/ 3.3% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP; 1 in 100+15% / 1% + 15% AEP with climate change; 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; and 1 in 1000 / 0.1% AEP.

Modelled in-channel flood flows and levels

THM362348

The modelled flood levels and flows for the closest most appropriate model node points for your site that are within the river channel are provided below:

				Flood Levels (mAOD)											
Node label	Model	Easting	Northing	20% AEP	5% AEP	3.3% AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP	
061 22 2018 001GPDC1 495.2	Kennet (Tyle Mill to Thames Confluence) 2018	470090	170434	38.35	38.61	38.66	38.88		39.00		39.09	39.16	39.36	39.21	
061 22 2018 001GPC1 495i2.1	Kennet (Tyle Mill to Thames Confluence) 2018	470159	170415	38.35	38.61	38.66	38.88		39.00		39.09	39.16	39.36	39.21	
061 22 2018 001GPC1 495i2.2	Kennet (Tyle Mill to Thames Confluence) 2018	470219	170385	38.35	38.61	38.66	38.88		39.00		39.09	39.16	39.36	39.21	
061 22 2018 001GPC1 495i3.2	Kennet (Tyle Mill to Thames Confluence) 2018	470274	170359	38.35	38.61	38.66	38.88		39.00		39.09	39.16	39.36	39.21	
061 22 2018 001GPDC1 230C.2	Kennet (Tyle Mill to Thames Confluence) 2018	470278	170359	38.35	38.61	38.66	38.88		39.00		39.09	39.15	39.36	39.21	

				Flood Flows (m3/s)										
Node label	Model	Easting	Northing	20% AEP	5% AEP	3.3% AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
061 22 2018 001GPDC1 495.2	Kennet (Tyle Mill to Thames Confluence) 2018	470090	170434	0.02	0.03	0.04	0.07		0.41		0.46	0.47	0.86	0.50
061 22 2018 001GPC1 495i2.1	Kennet (Tyle Mill to Thames Confluence) 2018	470159	170415	0.02	0.04	0.05	0.08		0.44		0.53	0.55	1.01	0.57
061 22 2018 001GPC1 495i2.2	Kennet (Tyle Mill to Thames Confluence) 2018	470219	170385	0.02	0.04	0.05	0.09		0.49		0.60	0.61	1.20	0.66
061 22 2018 001GPC1 495i3.2	Kennet (Tyle Mill to Thames Confluence) 2018	470274	170359	0.02	0.04	0.06	0.10		0.56		0.69	0.80	1.62	0.95
061 22 2018 001GPDC1 230C.2	Kennet (Tyle Mill to Thames Confluence) 2018	470278	170359	0.02	0.04	0.05	0.14		0.60		0.99	1.15	1.68	1.15

Note:
Due to changes in guidance on the allowances for climate change, the percentage increase in river flows above should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.

Modelled floodplain flood levels

THM362348

The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

2D grid cell reference	Model	Easting	Northing	flood levels (mAOD)										
				20% AEP	5% AEP	3.3 AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
Floodplain 1	Kennet (Tyle Mill to Thames Confluence) 2018	470,170	170,377	No Data	No Data	No Data	No Data		No Data		39.09	39.15	39.36	39.21
Floodplain 2	Kennet (Tyle Mill to Thames Confluence) 2018	470,192	170,343	No Data	No Data	No Data	No Data		No Data		No Data	39.15	39.36	39.21

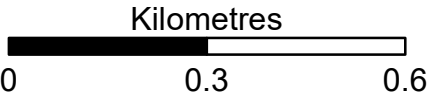
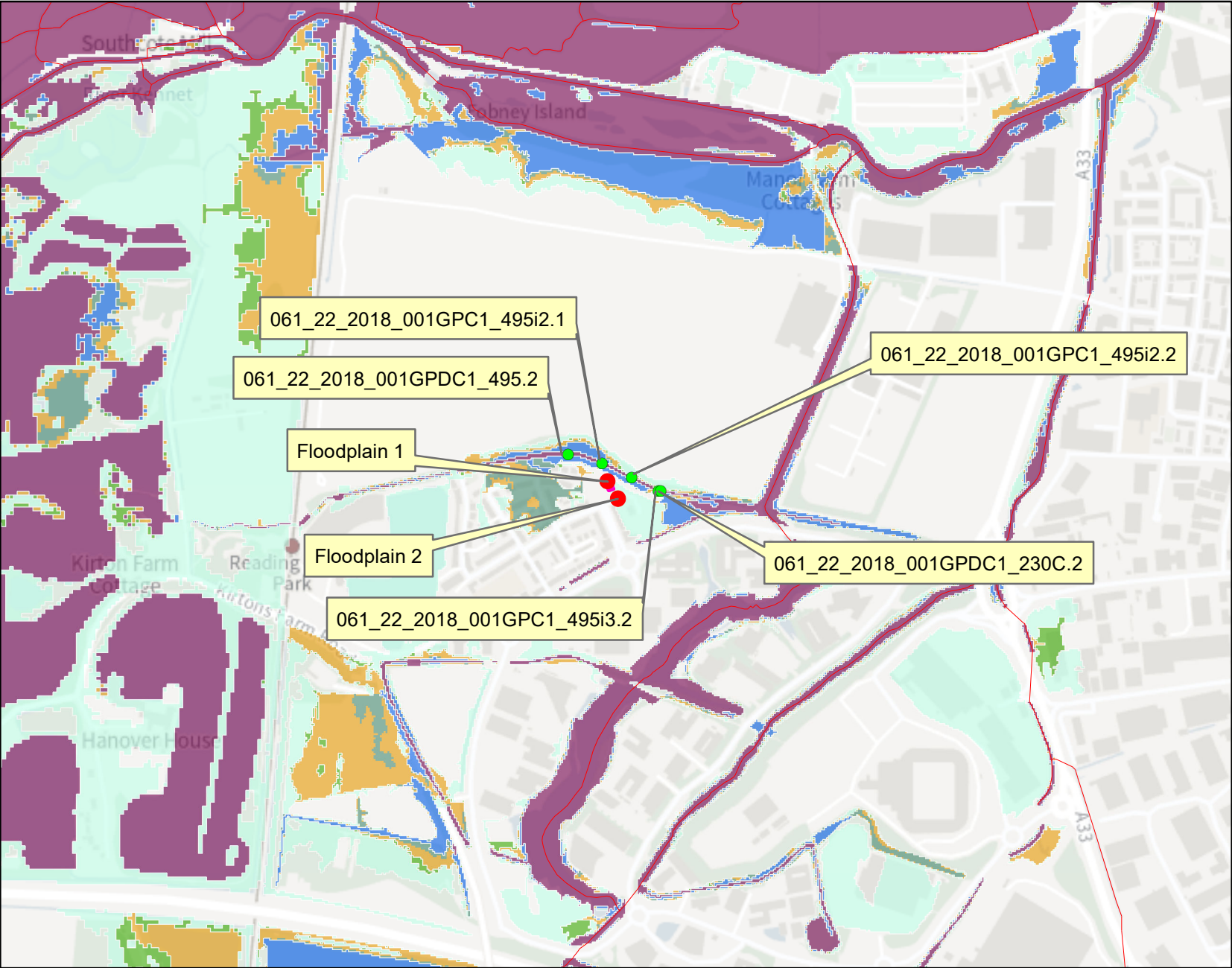
This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Note:
Due to changes in guidance on the allowances for climate change, the percentage increase in river flows above should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Detailed FRA map centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS

Created on 10/06/24 REF: THM362348



Legend

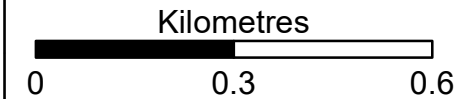
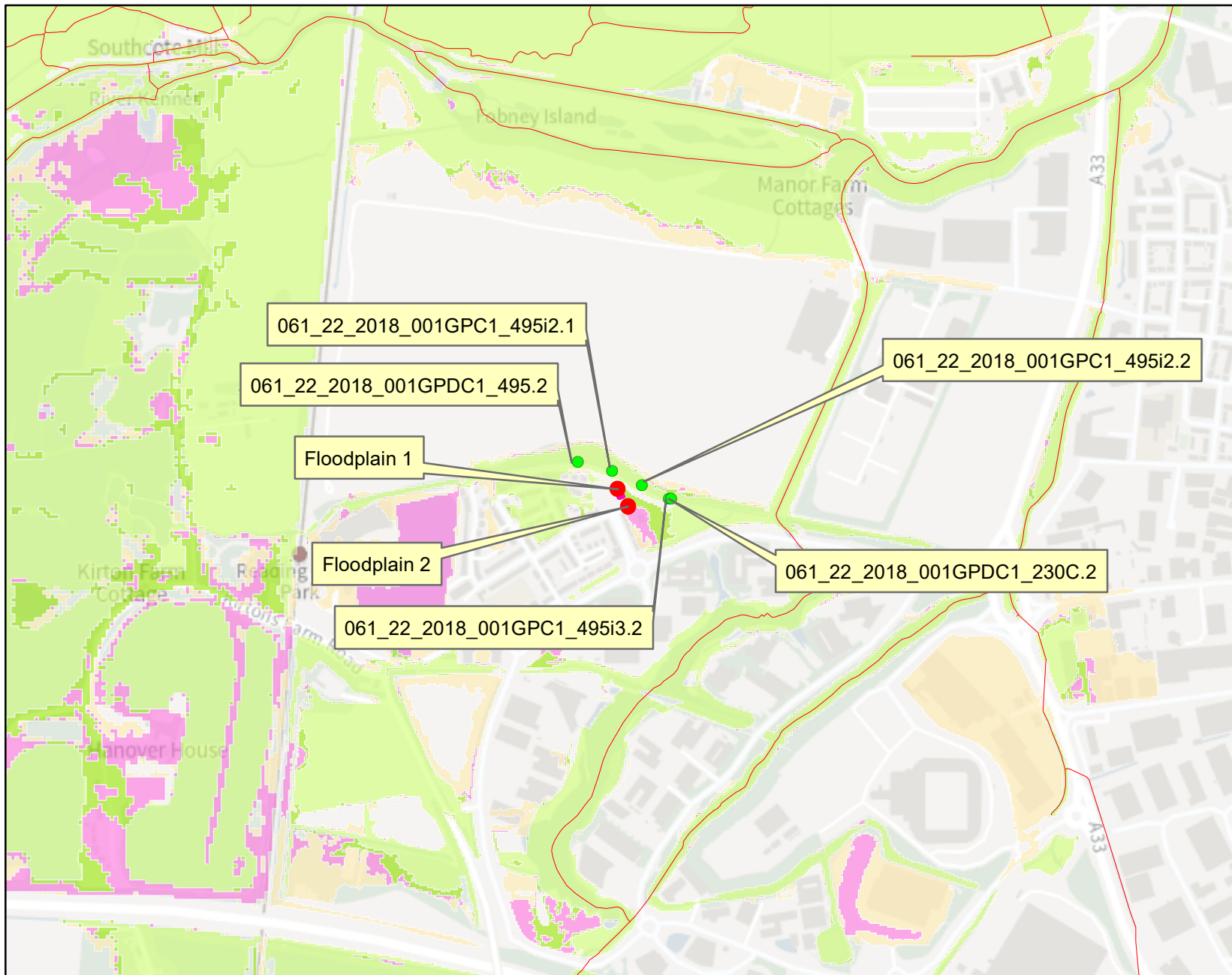
- Statutory Main Rivers
- Site
- THM Model Node Data selection
- 20% AEP Flood Outline
- 5% AEP Flood Outline
- 3.3% AEP Flood Outline
- 1.33% AEP Flood Outline
- 1% AEP Flood Outline
- 0.1% AEP Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year

Where available climate change extents have been calculated with an additional flow added to an AEP event. An example of how this is written is 1%+20% AEP.

Detailed FRA map centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS

Created on 10/06/24 REF: THM362348



Legend

- Statutory Main Rivers
- Site
- THM Model Node Data selection
- 1%+15% CC AEP Flood Outline
- 1%+25% CC AEP Flood Outline
- 1%+35% CC AEP Flood Outline
- 1%+70% CC AEP Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year

Where available climate change extents have been calculated with an additional flow added to an AEP event. An example of how this is written is 1%+20% AEP.

Historic flood data

THM362348

Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

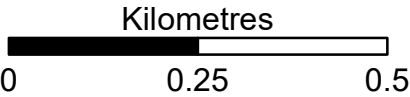
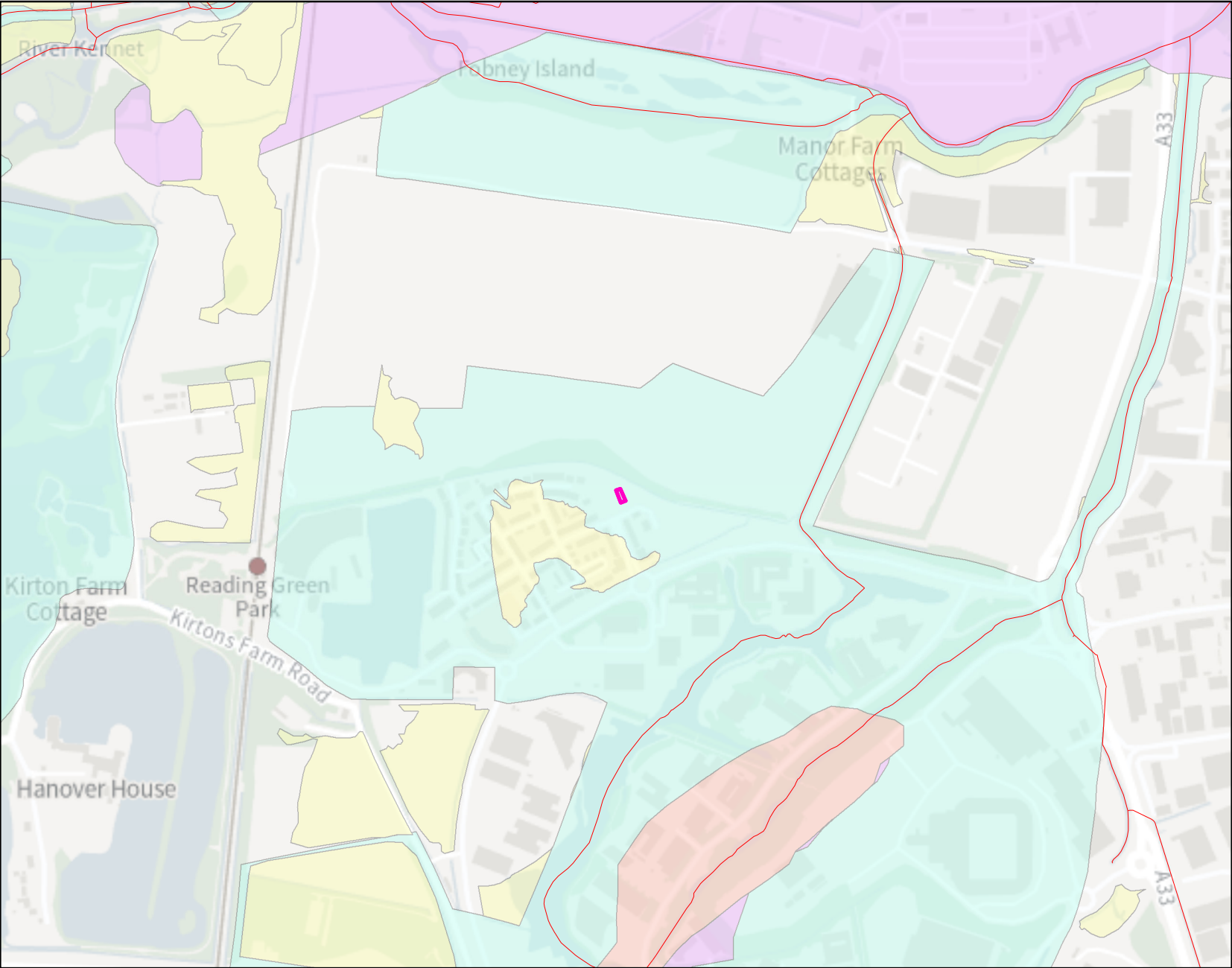
Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0620030102035	06JanuaryNewYear2003	23/12/2002	12/01/2003	main river	channel capacity exceeded (no raised defences)
EA0619710600031	06JuneSummer1971	01/01/1971	12/12/1971	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.

Historic flood map centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS

Created on 10/06/24 REF: THM362348



Legend

- Statutory Main Rivers
- Site
- 1971
- 1992
- 1993
- 2002/03

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Hazard Mapping

Hazard Mapping methodology:

To calculate flood hazard with the debris factor we have used the supplementary note to Flood Risk to People Methodology (see below).

The following calculation is used:

$$HR = d \times (v+0.5) + DF$$

Where HR = flood hazard rating

d = depth of flooding (m)

v = velocity of floodwaters (m/sec)

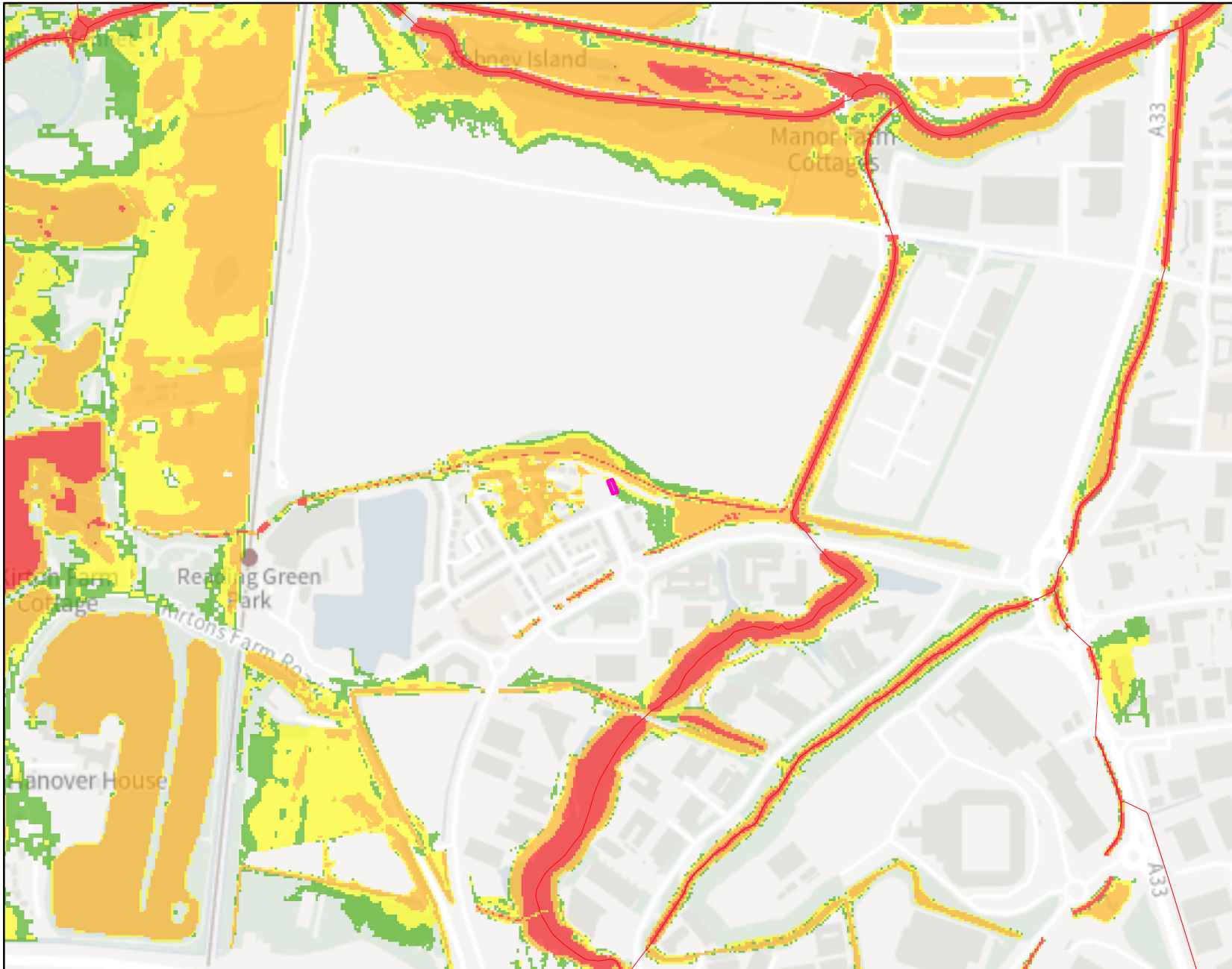
DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

The resultant hazard rating is then classified according to:

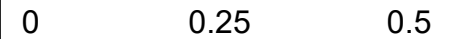
Flood Hazard	Colour	Hazard to People Classification
Less than 0.75		Very low hazard - Caution
0.75 to 1.25		Danger for some - includes children, the elderly and the infirm
1.25 to 2.0		Danger for most - includes the general public
More than 2.0		Danger for all - includes the emergency services

REF: HR Wallingford and Environment Agency (May 2008) Supplementary note of flood hazard ratings and thresholds for development planning and control purpose – Clarification of the Table 113.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1

25%cc Hazard map map centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS
Created on 10/06/24 REF: THM362348



Kilometres



Legend

-  Statutory Main Rivers
 Site
 Low hazard
 Danger to some
 Danger to most
 Danger to all

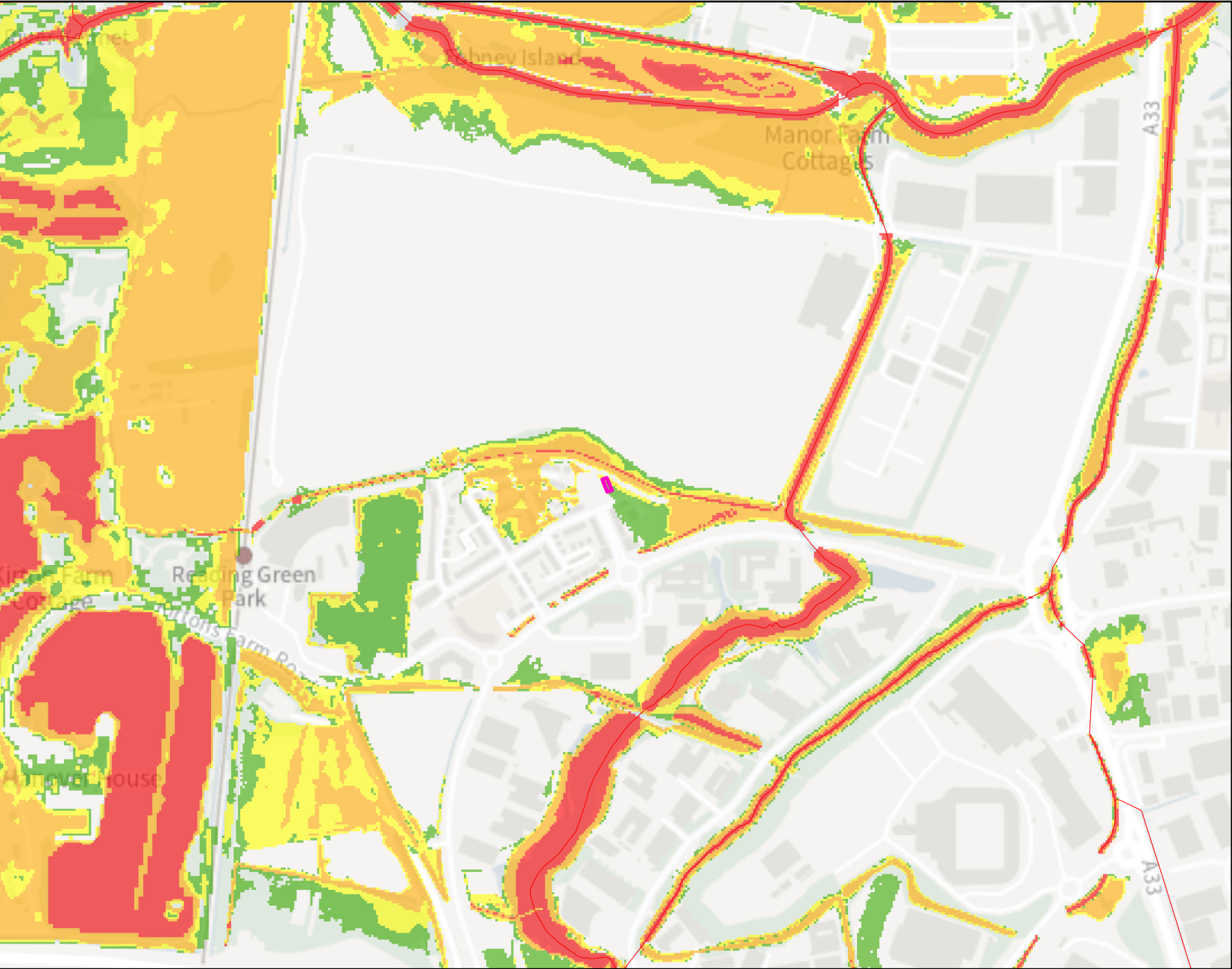
For hazard and debris factor we used HR Wallingford and Environment Agency (May 2008) supplementary note on flood hazard ratings and thresholds for development planning and control purpose. The following calculation is used:

$$HR = d \times (v + 0.5) + DF$$

HR = flood hazard rating
 d = depth of flooding (m)
 v = velocity of floodwaters (m/sec)
 DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

35%cc Hazard map map centred on 8 Laneborough Street, Reading, Berkshire, RG2 6BS

Created on 10/06/24 REF: THM362348





Environment
Agency

Kilometres

0

0.25

0.5

Legend

Statutory Main Rivers

Site

Low hazard

Danger to some

Danger to most

Danger to all

For hazard and debris factor we used HR Wallingford and Environment Agency (May 2008) supplementary note on flood hazard ratings and thresholds for development planning and control purpose. The following calculation is used:
HR = d x (v+0.5) + DF
HR = flood hazard rating
d = depth of flooding (m)
v = velocity of floodwaters (m/sec)
DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

