The Molesey Venture Centre

NPPF: Flood Risk Assessment

For Lifestyle Residences

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The Molesey Venture Centre	
Project	NPPF: Flood Risk Assessment
Client	Lifestyle Residences
Status	Final
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EXECUTIVE SUMMARY

The proposed development would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this Flood Risk Assessment (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 National Planning Policy Framework (NPPF) and Elmbridge Council guidance.

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.

1.0 INTRODUCTION

1.1 Background

This Flood Risk Assessment (FRA) has been prepared by KRS Environmental Limited at the request of Lifestyle Residences to support a planning application for the proposed development at The Molesey Venture Centre. A separate Drainage Strategy in support of the planning application has been undertaken by others.

This FRA has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)[1] and associated Planning Practice Guidance (PPG)[2]. 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.

[1] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework.
[2] Communities and Local Government (2022) Planning Practice Guidance - Flood Risk and Coastal Change.

1.3 Elmbridge Borough Council Core Strategy Policy CS26 – Flooding

Policy CS26 of the Elmbridge Borough Council Core Strategy provides guidance on flood risk and the planning process:

*"*In order to reduce the overall and local risk of flooding[3] in the Borough:

1. Development must be located, designed and laid out to ensure that it is safe; the risk from flooding is minimised whilst not increasing the risk of flooding elsewhere; and that residual risks are safely managed. Planning permission therefore will only be granted, or land allocated for development where it can be demonstrated that:

> Through a sequential test it is located in the lowest appropriate flood risk zone in accordance with PPS25[4] and the Elmbridge Strategic Flood Risk Assessment.
>
> It would not constrain the natural function of the flood plain, either by impeding flood flow or reducing storage capacity.
>
> Where sequential and exceptions tests have been undertaken, any development that takes place where there is a risk of flooding will need to ensure that flood mitigation measures are integrated into the design to minimise the risk to property and life should flooding occur.

2. Permitted development rights for development which could result in a loss of flood storage capacity or impede flood flow will be removed from new developments in flood zone 3, in order to ensure the risk of flooding is not increased through unregulated development.

3. In the event that development takes place in flood zones 2 or 3, the Council will require flood resistance and resilience measures in line with current Environment Agency advice[5] , and advice included within the Elmbridge SFRA[6].

4. New developments will need to contain SuDS, in line with the Council's Climate Neutral Development Checklist[7]. All development within flood zones 2 and 3 will require surface water runoff to be controlled, as near to its source as possible, and at greenfield rates. Where SuDS have not been used in these areas the applicant should justify these reasons.

5. For the classification of flood zones, the Council will take account of the recommendations of the most recent Strategic Flood Risk Assessment, and reclassify to take account of climate change and the protection of dry islands surrounded by high flood risk areas (see CS14-Green Infrastructure and CS15-Biodiversity).

6. The Council will support recommendations contained within the Lower Thames Strategy, provided that these do not result in an unacceptable impact on the local environment.

7. The Council will protect all undeveloped flood plains such as Desborough Island and Hurst Park, East Molesey, from non-flood compatible uses, and promote flood-compatible ones in accordance with PPS25.*"*

[3] Includes both fluvial and surface water flooding.
[4] PPS 25 Development and Flood Risk - www.communities.gov.uk/planningandbuilding.
[5] www.environment-agency.gov.uk.
[6] See Para 6.4.2 of the Strategic Flood Risk Assessment.
[7] The Elmbridge SFRA provides advice on the use of SuDS in new development. Further advice can be found in PPS25 Annex F. It is acknowledged that not all types of SuDS will be appropriate for every individual development site, However, a sustainable drainage approach should be possible on any site. www.communities.gov.uk/planningandbuilding.

1.4 Elmbridge Borough Council Flood Risk Supplementary Planning Document (SPD) 2016[8]

The following advice is contained within the Flood Risk SPD:

*"*Flooding should be considered as early as possible in preparing development proposals and this guidance is to help them consider the flood risk to a property or site when applying for planning permission.

As part of a planning application the Council will require applicants to demonstrate full consideration of flood risk to a site and have taken steps to manage flood risk as part of the proposal. This SPD sets out when a Flood Risk Assessment (FRA) needs to be prepared and what should it include. The requirements depend upon the type of development being proposed and the level of flood risk.

> The planning process looks to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk of flooding. Where new development is necessary in high risk areas, it must be made safe without increasing flood risk elsewhere and, where possible, reducing flood risk overall. Flooding should be considered as early as possible in preparing development proposals and this guidance is to help them consider the flood risk to a property or site when applying for planning permission.*"*

1.5 Environment Agency

The Environment Agency has made comments with regards to the proposed development within their letter dated the 29th March 2023, within which the Environment Agency has confirmed that (see Appendix 3):

*"*The proposed development is within 8 metres of a main river, the River Ember. According to our Flood Map for Planning, the application site partially lies within Flood Zones 2 and 3, which is land defined by the Planning Practice Guidance (PPG) as having a medium and high probability of flooding respectively.*"*

Within their letter the Environment Agency has made the following comments:

*"*Environment Agency position

We have two objections to the application as submitted.

Objection 1 – Flood Risk

In accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the National Planning Policy Framework (NPPF), in the absence of an acceptable Flood Risk Assessment (FRA), we object to this application and recommend that planning permission is refused.

Reason(s) 1

The submitted FRA does not comply with the requirements for site-specific flood risk assessments, as set out in paragraphs 20 to 22 of the Flood Risk and Coastal Change section of the Planning Practice Guidance. Therefore, the FRA does not adequately assess the flood risks posed by the development. In particular, the FRA fails to:

> Provide evidence (for example, using a topographic survey) to confirm the ground levels referred to in sections 2.4, 3.8, 3.14, and 6.2;

[8] Elmbridge Borough council – Flood Risk Supplementary Planning Document – May 2018.

Provide evidence (for example, using exact measurements to compare differences in built footprint from the existing development to the proposed development, particularly for the southwest section of the development which is situated within FZ3a) to support the statements made in sections 4.1 and 6.3 regarding the requirement for floodplain compensatory storage;

Provide sufficient evidence (for example, displaying full calculations, with a full justification for the method(s) used, including any assumptions made in respect of the relationship between flood levels and 1% increases in climate change river flows) to support the figures referred to in section 3.8 regarding the calculation of the design flood event levels (1% annual exceedance probability (AEP) plus 12% climate change flood event), which have been derived from the Environment Agency Product 4 data for the 1% AEP (plus 20% climate change) event to inform the Finished Floor Levels (FFLs) referred to;

Justify the consultants' interpretations of the Environment Agency Product 4 data regarding the statements made in section 3.3 on historic flooding, and in sections 3.8 and 3.14 on modelled site inundation, as these appear to contradict the figures which are referred to as evidence.

This objection is in accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the NPPF which states 'Development must be located, designed and laid out to ensure that it is safe; the risk from flooding is minimised whilst not increasing the risk of flooding elsewhere; and that residual risks are safely managed'. Furthermore, if 'development takes place in flood zones 2 or 3, the Council will require flood resistance and resilience measures in line with current Environment Agency advice'.

Overcoming our objection 1

To overcome our objection, the applicant should submit a revised FRA which addresses the points highlighted above. If this cannot be achieved, we are likely to maintain our objection. Please re-consult us on any revised FRA submitted.

Objection 2 – Biodiversity

The submitted planning application and associated documents indicate that a significant loss of riparian semi-natural habitat within the riparian zone of the River Ember will be required as part of the proposed development. This activity will require a flood risk activity permit under the Environmental Permitting (England and Wales) Regulations 2016 which is unlikely to be granted for the current proposal. In accordance with Policy CS15: Biodiversity of the Elmbridge Core Strategy (July 2011), we therefore object to the proposed development, due to its impacts on nature conservation, ecology and physical habitats. We recommend that planning permission is refused.

Reasons(s)

In determining the flood risk activity permit for this development, we will assess its compliance with the Thames River Basin Management Plan (RBMP). We'll also consider how the development will affect water biodiversity and the wetland environment. The RBMP states that the water environment should be protected and enhanced to prevent deterioration and promote the recovery of water bodies. The watercourse is classified as 'Heavily Modified and Supports Good'. Physical modification of the watercourse is sited as a reason for not achieving Good.

This approach is supported by paragraphs 174 and 180 of the National Planning Policy Framework (NPPF) which recognise that the planning system should conserve and enhance the environment by minimising impacts on and providing net gains for biodiversity. If significant harm resulting from a

development cannot be avoided, adequately mitigated, or as a last resort compensated for, planning permission should be refused.

In addition, this is supported by Policy CS15: Biodiversity of the Elmbridge Core Strategy (July 2011), which states the Council will seek to identify and develop wildlife corridors to provide ecological 'stepping stones' and form a coherent local and regional biodiversity network in accordance with CS12: The River Thames and its tributaries and CS14: Green Infrastructure. Also, ensuring new development does not result in a net loss of biodiversity and where feasible contributes to a net gain through the incorporation of biodiversity features.

Furthermore, the Emerging Elmbridge Borough Council Local Plan (2037), which has an ambition to protect and enhance blue and green infrastructure, Policy ENV6 states 'Development proposals must seek to protect, enhance and conserve wildlife habitats and species by creating new natural areas or restoring and enhancing existing habitats'. In addition, Policy ENV1 states 'Development proposals must be designed with green and/or blue infrastructure as an integral component, whether this be by enhancing existing features or providing new assets. Planning applications will be refused where this is not clearly demonstrated'. Also, Policy SS1 states all development must respond to the climate emergency by 'Increasing the extent, connectivity and diversity of wildlife habitats to enable animals and plants to adjust.'

This objection is also supported by legislation set out in the Natural Environment and Rural Communities Act 2006 and Article 10 of the Habitats Directive which stresses the importance of natural networks of linked corridors to allow movement of species between suitable habitats, and promote the expansion of biodiversity.

Development that encroaches on watercourses can have a potentially severe impact on their ecological value. Networks of undeveloped buffer zones might also help wildlife adapt to climate change and will help restore watercourses to a more natural state as required by the RBMP.

Overcoming our objection 2

To overcome our objection, the applicant should:

> Provide plans for the provision and management of a 10-metre-wide buffer zone, where existing site constraints allow, measured from the bank top (defined as the point at which the bank meets the level of the surrounding land) alongside the River Ember.
>
> The buffer zone should be free from all built development, including paths, lighting, domestic gardens and formal landscaping.
>
> There shall be no light spill from external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this the specifications, location and direction of external artificial lights should be such that the lighting levels within 8 metres of the top of bank of the watercourse are maintained at background levels. The Environment Agency considers background levels to be a Lux level of 0-2. To reduce light spill onto the river corridor outside the buffer zone, all artificial lighting should be directional and focused with cowlings.
>
> The buffer zone should be planted with locally native species of UK genetic provenance and appropriately managed under an agreed scheme.
>
> Provide details demonstrating how the buffer zone will be protected during development (Construction Environmental Management Plan).

> Provide a detailed Landscape Environmental Management Plan – to show how the ecological buffer zone and river corridor will be managed over the longer term (including named body responsible for management) and maintained to protect the ecology of the water-dependent habitat."

The Environment Agency has made further comments with regards to the buffer zone within an email dated 17th April 2023

"Development that encroaches on watercourses can have a potentially severe impact on their ecological value. We would therefore like to see consideration within the proposed development for a scheme to protect a minimum 8 metre wide buffer zone along the River Ember. Please note that any encroachment within a 10 metre riparian zone is penalised within the BNG Rivers metric assessment, therefore to provide the most net gains we would recommend providing a 10 metre buffer zone where possible, and creating semi natural habitat along this corridor will provide the most benefit for wildlife. A 10 metre buffer zone is also supported by the Emerging Elmbridge Borough Council Local Plan.

As you've mentioned, a Flood Risk Activity Permit (FRAP) is required for works within 8 metres of a main river. Our letter dated 29 March 2023 (ref: WA/2023/130267/01-L01) is written in regards to our planning remit and the objection reasoning is based on the significant loss of riparian semi-natural habitat within the riparian zone of the River Ember. Permitting and planning are separate processes and we recommend you consult with us at the earliest opportunity regarding a permit by contacting: enquiries@environment-agency.gov.uk.

I hope this clarifies your query and to summarise, we are requesting an 8 metre buffer zone to the River Ember but recommend a 10 metre buffer zone for the reasons given above."

The Environment Agency has made further comments with regards to the proposed development within their letter dated the 25th September 2023, and have also provided two new data sets for the site (see Appendix 3). The Environment Agency has confirmed that the original data provided for the River Ember was incorrect and they mixed up the modelled water levels. The Environment Agency has also provided data for the River Thames. The Environment Agency have not confirmed was this data was not provided originally or why the error was not corrected sooner.

The Environment Agency have made the following comments within the letter dated the 25th September 2023:

"The additional information does not address our earlier flood risk concerns. In accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the National Planning Policy Framework (NPPF), in the absence of an acceptable Flood Risk Assessment (FRA), we therefore maintain our objection 1 – Flood Risk set out in our response dated 29 March 2022 (letter reference: WA/2023/130267/01-L01). We recommend that planning permission should be refused on this basis.

The additional information has addressed our earlier biodiversity concerns therefore subject to our flood risk objection being overcome, we have conditions we would recommend in regards to biodiversity.

Reasons

The site lies within Flood Zones 2 and 3, which is land defined by the Planning Practice Guidance as having a high probability of flooding. Notwithstanding the mitigation measures proposed, the risk to life and property, both within the development and in upstream and downstream locations from fluvial inundation would be unacceptable if the development were to be permitted.

The application does not demonstrate that occupants can remain safe for the lifetime of the development when allowances for climate change are taken into consideration. The applicant has used the correct climate change allowances to assess an extreme flood event. However, they have failed to show the extents of this flood event and how it will affect the site.

The proposed development will impede flood flow and reduce storage capacity thereby increasing the risk of flooding. In the FRA, Table 7 shows the buildings footprint increases by 1091m^2. The table also shows that the hardscaping footprint decreases by 530m^2. Overall, this still results in a loss of floodplain storage and therefore flood compensation is needed. We can see that a permeable paving has been added to the design to help prevent flooding, this is an acceptable SUDS strategy but cannot be accepted as a form of floodplain compensation. This is because permeable paving is not a direct form of flood mitigation.

In addition, it has come to our attention that the Product 4 data referred to in the submitted FRA is not entirely accurate in reference to this site. Part of the node data contained within the Product 4 data previously used for this site (under ref: 'KSL 230767 AC') is incorrect, and therefore updated Product 4 data will be required to ensure the FRA for this development uses the best available (corrected) data. We will supply this for you by responding to your original request with the updated data.

Subsequently, our previous request for the applicant to supply evidence and justification for their calculation of the 1% annual exceedance probability (AEP) plus 12% climate change flood event which had been derived from the node data for the 1% AEP plus 20% flood event will need to be readdressed once the corrected/updated Product 4 data has been supplied.

Furthermore, the applicant's comments in section 3.8 of the updated FRA suggesting that the site would be flood free during the 0.1% AEP flood event are based on the superseded Product 4 data previously supplied for this site, and therefore do not give an accurate depiction of the flood risk for the 1% AEP plus climate change or the 0.1% AEP scenarios.

This objection is in accordance with paragraph 164 of the NPPF which states the development must be safe for its lifetime without increasing flood risk elsewhere and paragraph 167 of the NPPF which states development must be appropriately flood resistant and resilient.

Overcoming our objection

To overcome our objection, the applicant should use the updated Product 4 data that will be supplied to submit a revised FRA which addresses the points highlighted above. If this cannot be achieved, we are likely to maintain our objection. Please re-consult us on any revised FRA submitted.

Further information – Floodplain storage

Any increase in built footprint or raising of ground levels should be compensated up to the 1% AEP plus an appropriate allowance for climate change flood level. Level for level floodplain compensation is the preferred method of mitigation and should be considered within the FRA.

Level for level floodplain compensation is the matching of floodplain storage volumes lost with new floodplain storage volume gained through the reduction of ground levels. We recommend that level for level floodplain storage calculations are provided in a table that sets out the change in volumes across the site using 100mm or 200mm slices (dependent on site specific considerations), stating the losses and gains for each slice. The location of the changes in floodplain storage should also be clearly identified in a plan or drawing that demonstrates the scheme would be hydraulically connected for each slice.

Excavation of the proposed flood plain compensation scheme should be completed prior to the construction of development to ensure flood plain capacity is maintained.

If this cannot be achieved, then the applicant may need to amend the development to ensure that there will be no increase in flood risk elsewhere (for example by reducing built footprint or amount of land raising proposed).”

2.0 LOCATION & DEVELOPMENT DESCRIPTION

2.1 Site Location

The site is located at The Molesey Venture Centre, Orchard Lane, East Molesey, KT8 0BN (see Figure 1). The National Grid Reference (NGR) of the site is 514610, 167350. The area of the site is 0.64 hectares (ha).

The Site Allocations section (Chapter 9) of the LPA's emerging Local Plan, confirms that the application site (reference D6/US462) is proposed to be allocated for the delivery, within 1-5 years, of 61 additional residential units (i.e. in addition to the existing units). The evidence base for the emerging Local Plan is the LPA's latest Land Availability Assessment (base date 31st March 2022), which also identifies the site as being suitable for the provision of 61 units (net) or 77 (gross), and the same information was also provided in the LPA's 2021 Land Availability Assessment.

Figure 1 - Site Location

2.2 Existing Development

The site is currently used for residential care and housing (see Appendix 1).

2.3 Proposed Development

Redevelopment of site by way of demolition (or partial demolition) of all existing buildings and the erection of 3 buildings comprising 74 residential units (15 x 1 bed, 48 x 2 bed and 11 x 3 bed) and ancillary facilities for residents, underground and surface level car and cycle parking, mechanical plant, soft and hard landscaping and associated diversion of existing Thames Water pipe.

The proposed finished floor levels of the buildings is 9.45 metres Above Ordnance Datum (mAOD) with the entrance to the basement set at 9.40mAOD. Further details with regard to the proposed development can be found in Appendix 1 and the accompanying information submitted with the planning application.

2.4 Ground Levels

A topographical survey of the site has recently been completed (see Appendix 2). The site rises slightly from west to east, with a minimum ground level of 8.51mAOD to the north east and 9.00mAOD to the west of the site. The maximum ground level is 9.90mAOD to the south east of the site. The majority of ground levels on the site are between 9.00mAOD and 9.50mAOD. The ground level at the entrance to the site is 9.73mAOD. The ground level at the location of the existing buildings to the south east is a minimum of 9.45mAOD. The bottom of the river bank of the River Ember is 6.25mAOD, this is outside of the developable area.

2.5 Catchment Hydrology

The nearest water feature is the River Ember, located adjacent to the western site boundary and the River Thames is located approximately 1.50km to the north of the site.

2.6 Ground Conditions

The British Geological Survey (BGS) mapping indicates that the underlying superficial geology in the northern 60% of the site consists of Alluvium which is classified as a Secondary (undifferentiated) Aquifer. The southern 40% consists of the Langley Silt Member which is classified as Unproductive Strata. The bedrock geology consists of the London Clay Formation which is classified as Unproductive Strata. Information from the National Soil Resource Institute details the site area as being situated on freely draining slightly acid loamy soils.

2.7 Groundwater

The Environment Agency has designated the bedrock deposits as Unproductive Strata - these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The superficial deposits are designated as Secondary (undifferentiated) Aquifer and Unproductive Strata.

2.8 Source Protection Zone

The site is not located within an Environment Agency Source Protection Zone.

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, local flood defences and flood water levels has been obtained from the Environment Agency (see Appendix 3).

3.3 Historic Flooding

The Environment Agency data shows that the site may have historically flooded, the channel capacity was exceeded (no raised defences) (see Figures 2 and 3). These records do not give an indication of the depth of flooding on the site. Since the 1968 flood event, flood defences have been constructed which protect the site against flooding. The return period of these events is unknown and since this event the flood defences have been built, the hydrology and topography of the area has been altered therefore, the flood pattern would be different compared to this event.

Data from the BGS indicates that the types of deposits in the locality of the site are of the type normally associated with floodplains. This normally relates to flooding which happened many thousands of years ago.

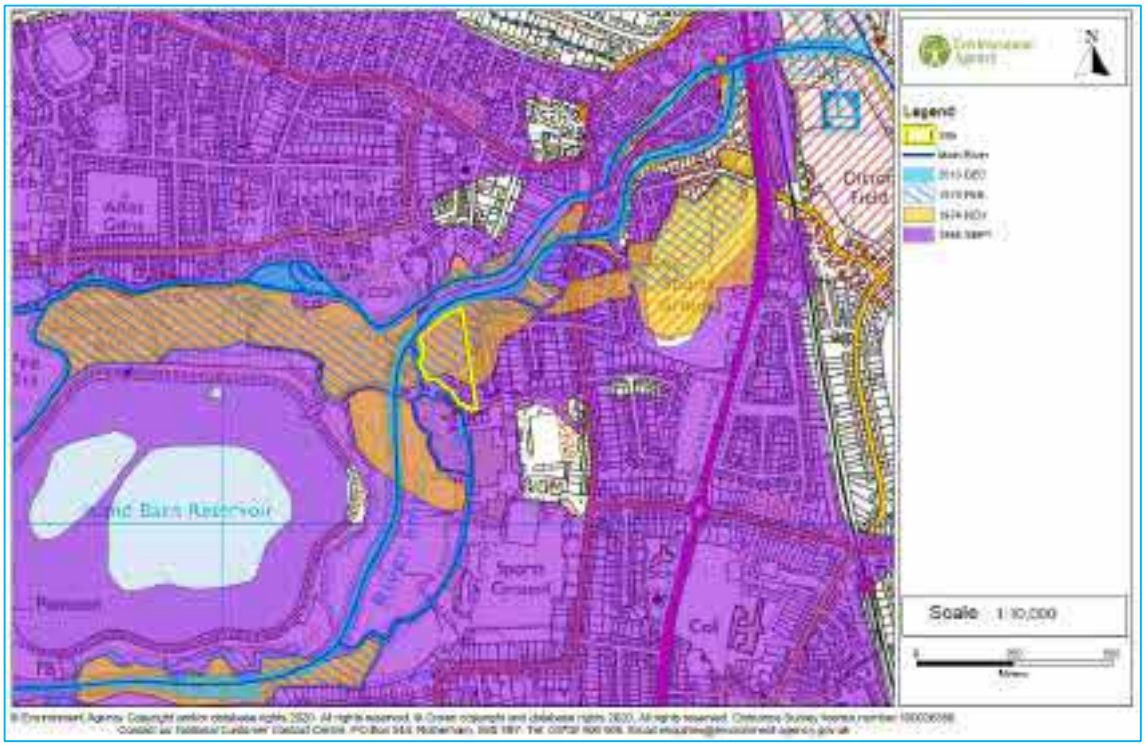


Figure 2 - Environment Agency Historic Flood Outlines

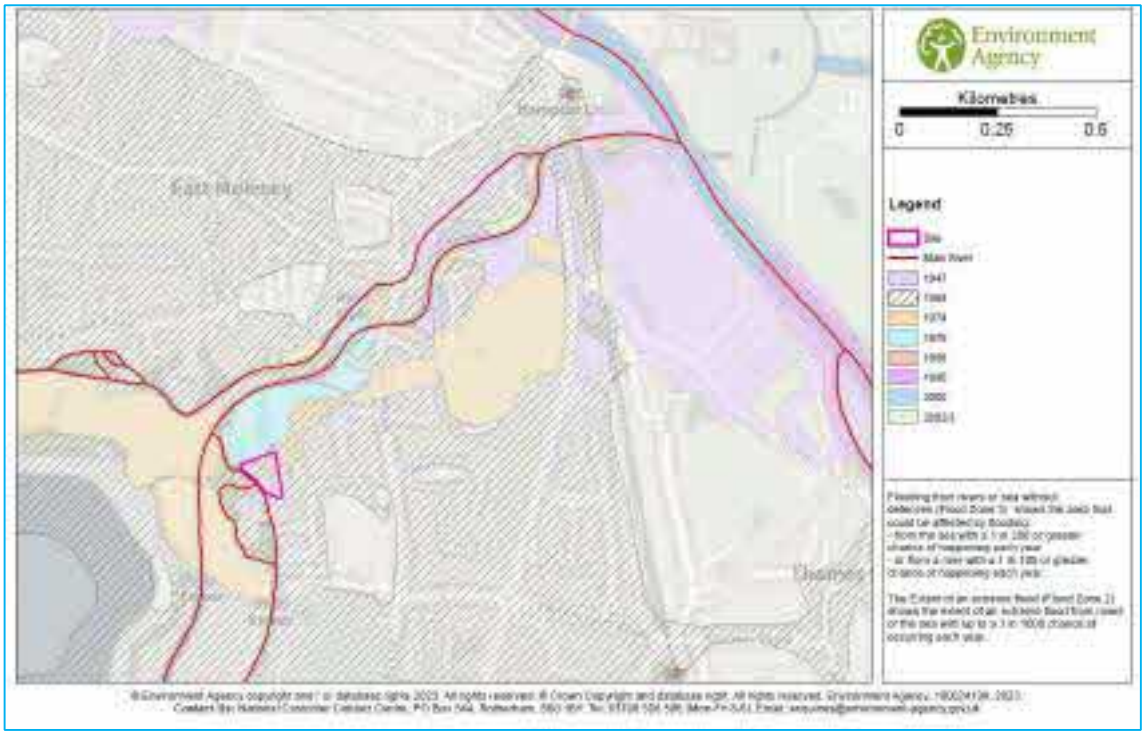


Figure 3 - Environment Agency Historic Flood Outlines

3.4 Existing and Planned Flood Defence Measures

The Environment Agency has confirmed that there are formal flood defences, known at the Lower Mole Flood Alleviation Scheme, within this area which protect the site from fluvial flooding. The Standard of Protection (SoP) of the scheme is 1 in 100 years (1%).

As a result of the great flood of 1968, the Lower Mole Flood Alleviation Scheme was built in the 1970's through to the mid 1980's. This scheme consists of a major channel creation, widening and dredging. 3km of earth bank have been constructed to keep the floods within the original floodplain upstream of Albany Bridge. The river is also now regulated through sluices and other structures designed to minimize flood damage. The scheme design flow is 241 cumecs. Of this, 31 cumecs flows via Royal Mills sluice before re-entering the flood relief channel downstream of Viaduct Sluice. The remaining 210 cumecs is diverted through Viaduct Sluice into the flood relief channel.

This site is within an area benefiting from flood defences. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year. If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

Further flood risk management measures will be used to protect the site from flooding, these are discussed in Section 5.0.

3.5 Environment Agency Flood Zones

A review of the Environment Agency's Flood Zones indicates that the site is located within Flood Zones 1, 2 and 3. Therefore, the site has a 'low to high probability' of river flooding, see Figure 4, with less than a 1 in 1000 annual probability of river flooding in any year (<0.1%) (Flood Zone 1) to a 1 in 100 or greater annual probability of river flooding (>1%) in any year (Flood Zone 3).

The majority of the site is located within Flood Zones 1 and 2 with the south of the site being located within Flood Zone 1 which has a 'low probability' of river flooding with less than 1 in 1000 annual probability of river flooding in any year (<0.1%). The north of the site is located within Flood Zone 2 with a 'medium probability' of river flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

A small area of the site to the west, immediately adjacent to the River Ember, is located within Flood Zone 3 with a 'high probability' of river flooding, with a 1 in 100 or greater annual probability of river flooding (>1%) in any year. However, this is located within the river corridor and is outside of the developable area of the site.

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. The Environment Agency Flood Zones show the worst case scenario.

The Environment Agency Flood Zones and acceptable development types are explained in Table 3. Tables 1 and 2 show that some development types are generally acceptable in Flood Zones 1, 2 and 3.

Figure 4 - Environment Agency Flood Zones

Table 1 - Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land Use
Zone 1	Low	A 1 in 1000 or less 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'	A 1% or greater chance of river flooding in any year (1 in 100 annual probability) or 0.5% or greater chance of sea flooding in any year (1 in 200 annual probability) 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). 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)	Some development types not acceptable

3.6 Flood Risk 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 designated as 'more vulnerable'.

The proposed development will not change the vulnerability of the site or introduce a new 'more vulnerable' developments into the floodplain and will provide betterment compared to the existing situation. 'More vulnerable' uses are appropriate within Flood Zones 1, 2 and 3 after the completion of a satisfactory FRA. Further flood risk management measures will be used to protect the site from flooding these are discussed in Section 5.0.

Table 2 - 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.

3.7 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. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the Flood risk assessments: climate change allowances guidance[9].

Table 3 shows the peak river flow allowances for the River Ember. The flood risk assessments: climate change allowances guidance recommends that for 'more vulnerable' uses that the central allowances are used. Therefore, the design flood level for the site is the 1 in 100 year (+12%) water level. Within the correspondence received from the Environment Agency, it has been confirmed that the design event is the 1 in 100 year (+12%) event.

Table 3 - Peak River Flow Allowances by River Catchment

River Catchment	Allowance Category	2020s	2050s	2080s
Mole Management Catchment	Upper	+27%	+26%	+40%
	Higher	+16%	+12%	+20%
	Central	+11%	+5%	+12%

3.8 Fluvial (river) Flooding

River Ember

Fluvial flooding from the River Ember poses a flood risk to the site. Table 4 shows the Environment Agency modelled floodplain water levels for the site. Figure 5 identifies the location of the Environment 2D nodes. The data for the River Ember has only recently been correctly by the Environment Agency, over 2 years after the original data request, the Environment Agency made an error when compiling the original data.

The modelled water levels 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. All the nodes within in Tables 4 within the site boundary and have been used to assess the flood risk to the site. Figures 6 and 7 show the Environment Agency modelled flood outlines.

[9] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances

Defended Scenario

The design flood level for the site is the 1 in 100 year (+12%) event, the water levels experienced at the site will be less that those experienced during the defended 1 in 100 year (+20%) event. For node 56058, during the 1 in 100 year event water levels have been modelled at 7.88mAOD and during the 1 in 100 year (+20%) event water levels have been modelled at 8.14mAOD. This equates to an increase of 0.26m due to a 20% climate change allowance of 0.013m per 1% of climate change, based on the equation shown below:

1% of climate change (m) = total increase from the 1 in 100 to 1 in 100 year (+20%) event (m) / climate change factor (%)

= 0.26m / 20

= 0.013m

The above has then been pro-rated to calculate the 1 in 100 year (+12%) event which equates to an increase of 0.16m due to a climate change allowance of 12%. This has then been added onto the 1 in 100 year water level of 7.88mAOD to calculate the 1 in 100 year (+12%) water level. Therefore, the defended 1 in 100 year (+12%) will have a water level of approximately 8.04mAOD for node 56058.

Figure 6 confirms that the site will not be inundated with floodwater for all events up to and including the defended 1 in 100 year (+20%) event, the site will be flood free during the defended 1 in 100 year (+20%) event. Therefore, the site will also be flood free during the smaller design flood event which is the 1 in 100 year (+12%) event.

However, during the defended 1 in 1000 year event, a small proportion of the site, to the north and west, may be inundated with floodwater. It should be taken into account that this would only occur over a small proportion of the site with the majority of ground levels being above 9.00mAOD and rising to 9.90mAOD on the site. The ground level at the entrance to the site is 9.73mAOD.

The finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides an adequate freeboard above the defended 1 in 100 year (+12%) and 1 in 100 year (+20%) events, see Section 5.3 for more details.

Table 4 - River Ember Modelled Floodplain Defended Water Levels (mAOD)

Node ID	Easting	Northing	Return Period (years)				
			20	100	100 (+12%)	100 (+20%)	1000
52134	514632	167394	Nil Return	Nil Return	Nil Return	Nil Return	8.88
52948	514597	167379	Nil Return	Nil Return	Nil Return	Nil Return	8.88
52950	514622	167379	Nil Return	Nil Return	Nil Return	Nil Return	8.88
53210	514572	167374	Nil Return	Nil Return	Nil Return	Nil Return	8.89
53977	514572	167359	Nil Return	Nil Return	Nil Return	Nil Return	8.93
53978	514622	167359	Nil Return	Nil Return	Nil Return	Nil Return	8.88
54222	514637	167354	Nil Return	Nil Return	Nil Return	Nil Return	8.88
54702	514592	167344	Nil Return	Nil Return	Nil Return	Nil Return	8.95
55178	514597	167344	Nil Return	7.88	8.04	8.14	8.95
56058	514612	167314	7.29	7.88	8.04	8.14	8.96

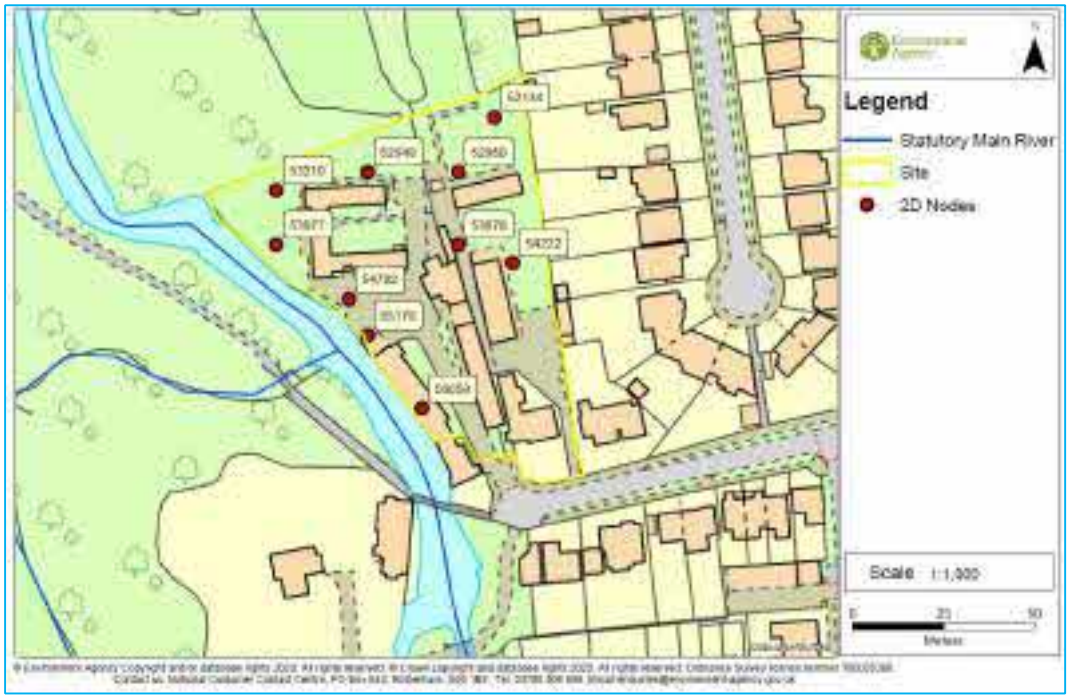


Figure 5 - Environment Agency 2D Node locations

Figure 6 - Environment Agency Defended River Ember Modelled Flood Outlines

Undefended Scenario

Figure 6 show that the site will not be inundated with floodwater for all events up to and including the undefended 1 in 100 year event. The site will be flood free during the undefended 1 in 100 year event however during the undefended 1 in 1000 year even a small proportion of the site, to the north and west, may be inundated with floodwater.

As noted above, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides an adequate freeboard above the floodwater levels.

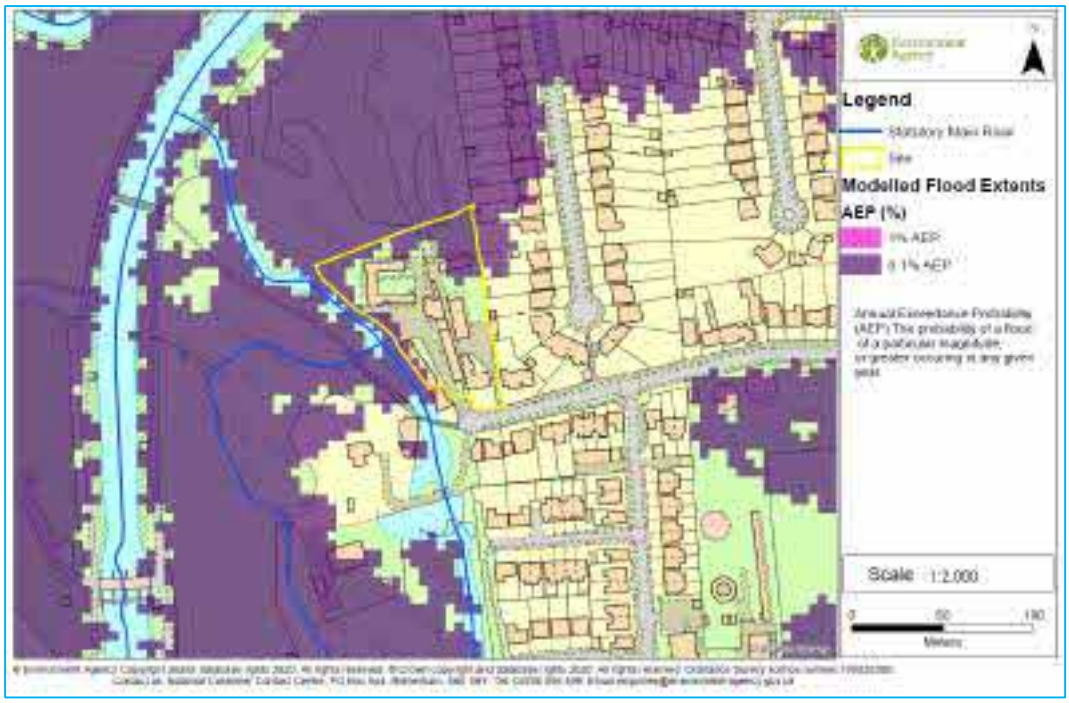


Figure 7 - Environment Agency Undefended River Ember Modelled Flood Outlines

River Thames

Fluvial flooding from the River Thames poses a flood risk to the site. Table 5 shows the Environment Agency modelled floodplain water levels for the site. The data for the River Thames has only recently been supplied by the Environment Agency, over 2 years after the original data request. The modelled water levels 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. All the nodes within in Tables 5 within the site boundary and have been used to assess the flood risk to the site. Figures 8 and 9 show the Environment Agency modelled flood outlines.

The design flood level for the site is the 1 in 100 year (+12%) event, the water levels experienced at the site will be less that those experienced during the 1 in 100 year (+15%) event. For floodplain 1, during the 1 in 100 year (15%) event water levels have been modelled at 8.78mAOD and during the 1 in 100 year (+25%) event water levels have been modelled at 9.10mAOD. This equates to an increase of 0.32m due to a 10% climate change allowance of 0.032m per 1% of climate change, based on the equation shown below:

1% of climate change (m) = total increase from the 1 in 100 (15%) to 1 in 100 year (+25%) event (m) / climate change factor (%)

= 0.32m / 10

= 0.032m

The above has then been pro-rated to calculate the 1 in 100 year (+12%) event which equates to an decrease of 0.10m due to a climate change allowance change from the 1 in 100 year (+15%) event to

the 1 in 100 year (+12%) event. Therefore, the 1 in 100 year (+12%) will have a water level of approximately 8.68mAOD for floodplain 1.

Table 5 - River Thames Modelled Floodplain Water Levels (mAOD)

Node ID	Easting	Northing	Return Period (years)						
			100	100 (+12%)	100 (+15%)	100 (+25%)	100 (+35%)	100 (+70%)	1000
Floodplain 1	514557	167367	Nil Return	8.68	8.78	9.10	9.40	10.18	9.33
Floodplain 2	514597	167378	Nil Return	Nil Return	Nil Return	9.03	9.34	10.16	9.29
Floodplain 3	514633	167403	Nil Return	8.51	8.63	9.02	9.34	10.16	9.29
Floodplain 4	514622	167358	Nil Return	Nil Return	Nil Return	9.02	9.34	10.16	9.29
Floodplain 5	514646	167310	Nil Return	Nil Return	Nil Return	9.02	9.35	10.15	9.29
Floodplain 6	514629	167317	Nil Return	Nil Return	Nil Return	Nil Return	9.42	10.17	9.33
Floodplain 7	514637	167287	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	10.18	Nil Return
Floodplain 8	514616	167309	Nil Return	Nil Return	Nil Return	Nil Return	9.45	10.18	9.35
Floodplain 9	514606	167326	Nil Return	Nil Return	Nil Return	9.15	9.44	10.17	9.35
Floodplain 10	514594	167346	Nil Return	8.75	8.84	9.15	9.42	10.17	9.34

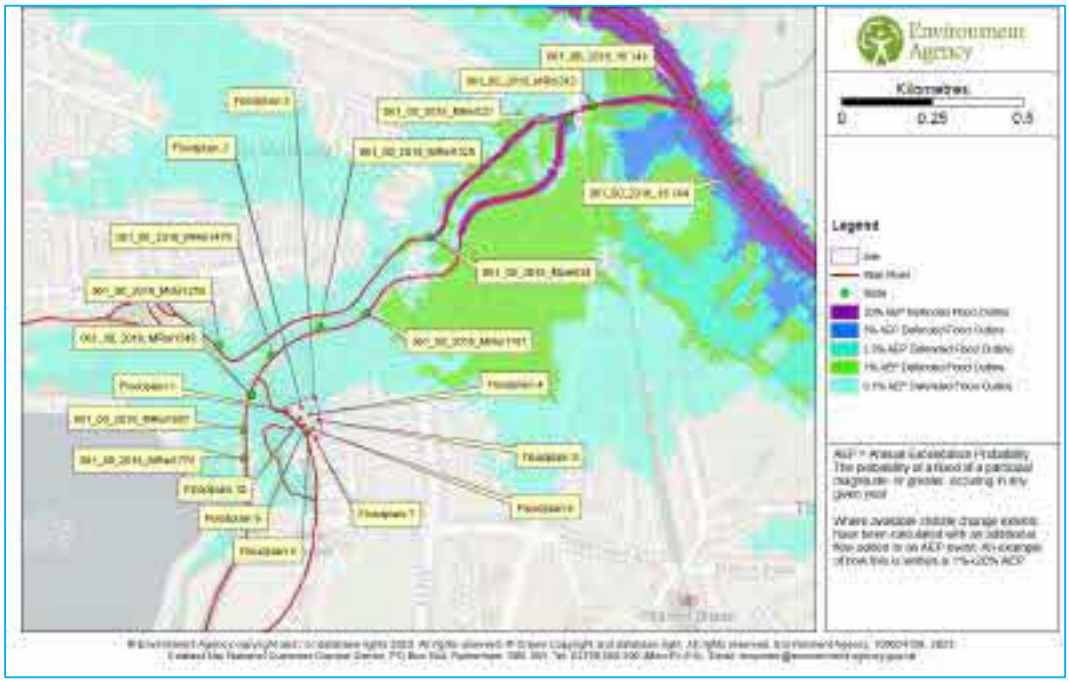


Figure 8 - Environment Agency River Thames Modelled Flood Outlines

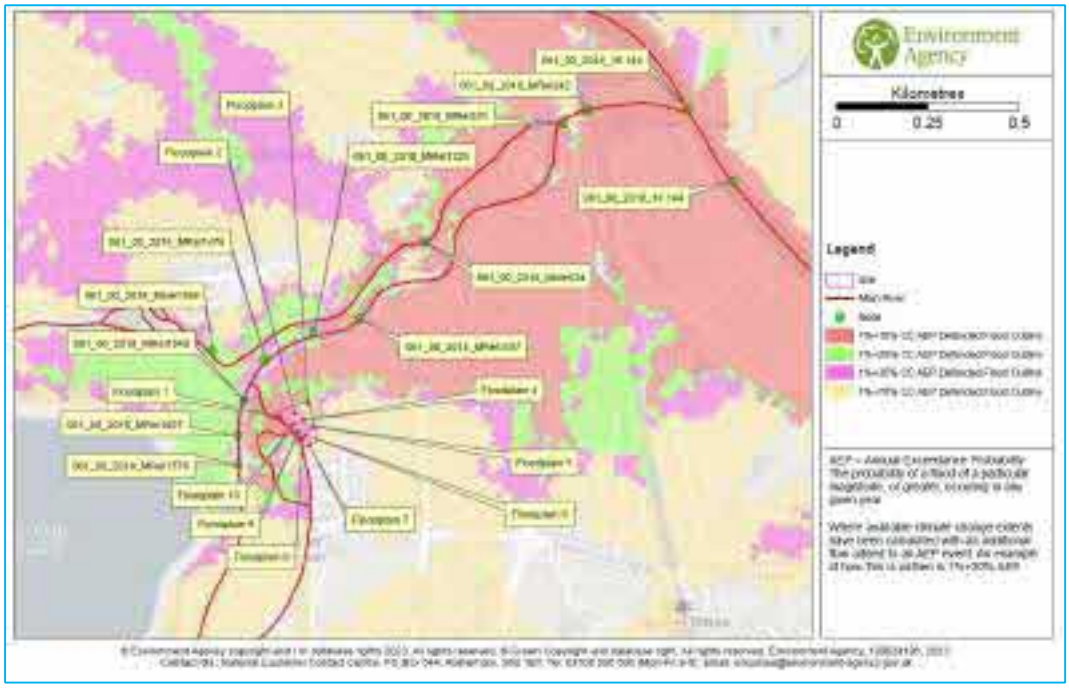


Figure 9 - Environment Agency River Thames Modelled Climate Change Flood Outlines

Figure 8 confirms that the site will not be inundated with floodwater for all events up to and including the 1 in 100 year event, the site will be flood free during the defended 1 in 100 year event. However, Figure 9 shows that during the 1 in 100 year (+15%) event a very small proportion of the site, to the northwest, may be inundated with floodwater. During the small design flood event, which is the 1 in 100 year (+12%) event, an even smaller proportion of the site, to the northwest, may be inundated with floodwater. The 1 in 100 year (+12%) flood outline will cover a small area than the 1 in 100 year (+15%) flood outline shown in Figure 9. Figure 8 shows that during the 1 in 1000 year event, a small proportion of the site, to the north and west, may be inundated with floodwater.

Table 6 shows that the ground levels taken from the topographical survey are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for the corresponding locations. For floodplain nodes 1, 3 and 10 the ground levels are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for these locations. Therefore, based on the topographical survey of the site, the site will in fact not be inundated with floodwater during the 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

The ground levels from the topographical survey provide a much accurate representation of the site ground levels compared to the LiDAR data used within the Environment Agency's modelling. By comparing the modelled water levels to the topographical survey a much more accurate representation of the flood risk posed to the site is shown. This method shows the flood risk in more detail.

The ground levels at floodplain node 1 are located 0.06m above the corresponding water level of 8.78mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 3 are located 0.02m above the corresponding water level of 8.63mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 10 are located 0.46m above the corresponding water level of 8.75mAOD for the 1 in 100 year (+15%) event.

Furthermore, the majority of ground levels being above 9.00mAOD and rising to 9.90mAOD on the site. The ground level at the entrance to the site is 9.73mAOD. As noted above, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to

9.45mAOD which provides an adequate freeboard above the undefended 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

Table 6 - River Thames Modelled Water Levels Compared to Ground Levels (mAOD)

Node ID	Easting	Northing	Ground Level	Return Period (years)			
				100	100 (+12%)	100 (+15%)	1000
Floodplain 1	514557	167367	8.84	Nil Return	8.68	8.78	9.33
Floodplain 3	514633	167403	8.65	Nil Return	8.51	8.63	9.29
Floodplain 10	514594	167346	9.30	Nil Return	8.75	8.84	9.29

Summary

The site is located where the onset of flooding is gradual 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.

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 and the risk of fluvial flooding is considered to be of medium significance. Further flood risk management measures will be used to protect the site from flooding these are discussed in 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).

According to the GeoSmart Groundwater Flood Risk (GW5) Map, the risk of groundwater flooding at the site is negligible (see Figure 10). The Environment Agency has designated the bedrock deposits as Unproductive Strata - these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The superficial deposits are designated as Secondary (undifferentiated) Aquifer and Unproductive Strata.

No shallow groundwater was encountered to a maximum depth of 1.50 metres Below Ground Level (mBGL) during the recent site investigation and no groundwater was observed within any of the six boreholes drilled directly to the south west of the site in 2014, for Ember Farm Cottage (planning application ref: 2011/5700), to depths of up to 2.10mBGL.

Site ground conditions suggest a negligible potential for groundwater flooding. Furthermore, no incidents of groundwater flooding within the vicinity of the site have been recorded. The risk of flooding from groundwater flooding is considered to be not significant.

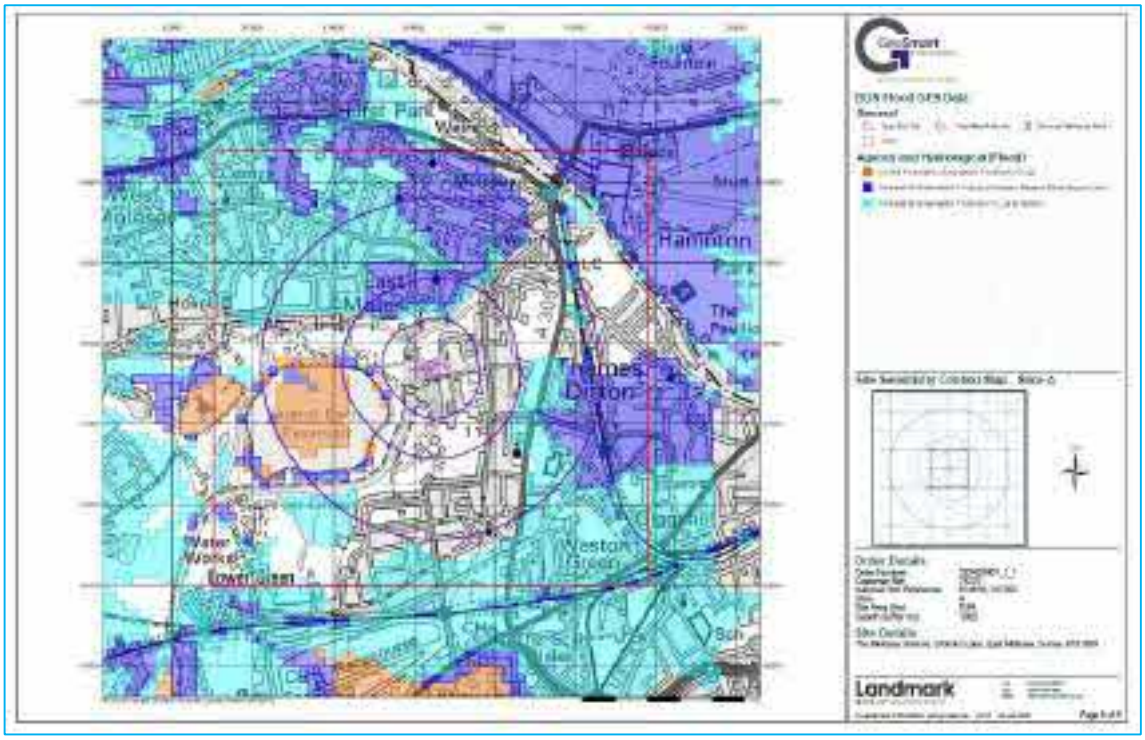


Figure 10 - GeoSmart Groundwater Flood Risk (GW5) Map (GeoSmart, 2021)

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 majority of the site has a very low risk of surface water flooding with a chance of flooding of less than 1 in 1000 (0.1% and 1%) years (see Figure 11). A small area of the site has a low risk of surface water flooding with a chance of flooding of between 1 in 100 and 1 in 1000 (0.1% and 1%) years. Therefore, the risk of flooding from surface water flooding is considered to be of low significance. Further flood risk management measures will be used to protect the site from flooding these are discussed in Section 5.0.

Figure 11 - 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. Sewer flooding poses a flood risk to the site therefore, the risk of flooding from sewer flooding is considered to be of low significance. Further flood risk management measures will be used to protect the site from flooding these are discussed in Section 5.0.

3.13 Flooding from Artificial Drainage Systems/Infrastructure Failure

The site is located within the vicinity of Thames Water reservoirs. Figure 12 shows that the site is at risk of flooding from reservoir failure. This map shows the largest area that might be flooded if a reservoir were to fail and release the water it holds.

The Environment Agency Reservoir flood map has been prepared for emergency planning purposes and for this reason they reflect a worst case scenario. Since this is a prediction of a worst case scenario, it is unlikely that any actual flood would be this large.

Reservoir flooding is extremely unlikely; reservoirs in the UK have a very good safety record. There has been no loss of life in the UK from reservoir flooding since 1925. Since then reservoir safety legislation has been introduced to make sure reservoirs are well maintained.

The hazard is well managed through effective legislation and it is unlikely that the impact zone downstream of these reservoirs should not allow the proposed development. Reservoir flooding poses a very low flood risk to the site therefore, the risk of flooding from reservoir flooding is considered to be not significant.

There are no other nearby artificial water bodies, reservoirs, water channels and artificial drainage systems that could be considered a flood risk to the site. The risk of flooding from artifical drainage systems/infrastructure failure is considered to be not significant.

Figure 12 - Environment Agency Reservoir Flood Map

3.14 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 7.

Table 7 - Risk Posed by Flooding Sources

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

The site is unlikely to flood except in extreme conditions. The principal flood risk posed to the site is from fluvial flooding from the River Thames. The site is located within Flood Zones 1, 2 and 3. The majority of the site is located within Flood Zones 1 and 2 with the south of the site being located within Flood Zone 1 which has a 'low probability' of river flooding with less than 1 in 1000 annual probability of river flooding in any year (<0.1%). The north of the site is located within Flood Zone 2 with a 'medium probability' of river flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

A small area of the site to the west, immediately adjacent to the River Ember, is located within Flood Zone 3 with a 'high probability' of river flooding, with a 1 in 100 or greater annual probability of river flooding (>1%) in any year. However, this is located within the river corridor and is outside of the developable area of the site.

By comparing the modelled water levels for the River Thames, which has only recently been supplied by the Environment Agency to the topographical survey, it has been shown that the site will in fact not be inundated with floodwater during the 1 in 100 year (+12%) and 1 in 100 year (+15%) events. The ground levels taken from the topographical survey are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for the corresponding locations. For floodplain nodes 1, 3 and 10 the ground levels are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for these locations.

The ground levels at floodplain node 1 are located 0.06m above the corresponding water level of 8.78mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 3 are located 0.02m above the corresponding water level of 8.63mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 10 are located 0.46m above the corresponding water level of 8.75mAOD for the 1 in 100 year (+15%) event.

Furthermore, the majority of ground levels being above 9.00mAOD and rising to 9.90mAOD on the site. The ground level at the entrance to the site is 9.73mAOD. As noted above, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides an adequate freeboard above the undefended 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

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 and the

risk of fluvial flooding is considered to be of medium significance. A number of secondary flooding source has been identified which may pose a low significant risk to the site. These are:

Surface Water Flooding

Sewer Flooding

The flooding sources will only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site. 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).

The proposed development will not change the vulnerability of the site or introduce a new 'more vulnerable' developments into the floodplain and will provide betterment compared to the existing situation. 'More vulnerable' uses are appropriate within Flood Zones 1, 2 and 3 after the completion of a satisfactory FRA.

The application is for a new, suitable flood-resilient design. The exposure of people and property will be reduced and minimised compared to existing site conditions. The chance of flooding each year is low each year. This takes into account the effect of any flood defences that may be located within the vicinity of the site as well property level protection measures.

4.0 IMPLICATIONS OF THE DEVELOPMENT ON FLOOD RISK

4.1 Calculation of Net Loss or Gain in Flood Storage Capacity

Within their letter dated the t letter dated the 25th September 2023 the Environment Agency have suggested that "the proposed development will impede flood flow and reduce storage capacity thereby increasing the risk of flooding." However, this is not the case, as explained below.

Table 8 and Appendix 1 shows the existing and proposed site areas. The site is currently occupied by existing buildings, the overall direction of the movement of water will be maintained within the developed site and surrounding area. The conveyance routes (flow paths) will not be blocked or obstructed. The topography of the site will not be altered therefore; the overland flow routes will not be altered.

Table 8 - Existing and Proposed Site Areas

Existing		Proposed	
Type of Development	Area (m^2)	Type of Development	Area (m^2)
Landscaping	3,783	Landscaping & Green roofs	3,222
Buildings	1,484	Buildings	2,575
Hardscape	2,240	Hardscape & Permeable Paving	1,710

Table 6 shows that the ground levels taken from the topographical survey are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for the corresponding locations. For floodplain nodes 1, 3 and 10 the ground levels are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for these locations. Therefore, based on the topographical survey of the site, the site will in fact not be inundated with floodwater during the 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

The ground levels from the topographical survey provide a much accurate representation of the site ground levels compared to the LiDAR data used within the Environment Agency's modelling. By comparing the modelled water levels to the topographical survey a much more accurate representation of the flood risk posed to the site is shown. This method shows the flood risk in more detail.

The ground levels at floodplain node 1 are located 0.06m above the corresponding water level of 8.78mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 3 are located 0.02m above the corresponding water level of 8.63mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 10 are located 0.46m above the corresponding water level of 8.75mAOD for the 1 in 100 year (+15%) event.

The existing ground levels at the locations of the proposed buildings are shown in Table 9. The exiting ground levels at the locations of the proposed buildings are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels.

There are no buildings proposed near the location of floodplain 3 to the north east of the site. The existing ground level at the location of the nearest proposed building (i.e. eastern portion of building A) to floodplain node 3 is 8.68mAOD, the 1 in 100 year (+15%) water level at floodplain node 3 is 8.63mAOD. The existing ground levels of the nearest proposed building to floodplain node 3 is well above the 1 in 100 year (+15%) water level.

The existing ground level at the location of the western portion of building A is 8.84mAOD and the corresponding 1 in 100 year (+15%) water level is 8.78mAOD. The existing ground level is 0.06m above the 1 in 100 year (+15%) water level for this location.

The existing ground level at the location of the proposed building B is 9.30mAOD and the corresponding 1 in 100 year (+15%) water level is 8.84mAOD. The existing ground level is 0.46m above the 1 in 100 year (+15%) water level for this location.

A minimum of an 8m buffer zone adjacent to the top of the River Ember will be retained. Along the majority of the river reach a buffer zone of greater than 8m is achieved with the majority of structures being over 10m away from the river and all new buildings being over 9.30m from the river. The existing building/s to be demolished are located within 7m of the top of bank of the River Ember. The proposed development will provide betterment compared to the existing situation by increasing the size of the buffer zone.

The proposed development proposes minimal new structures compared to the existing situation and will therefore allow floodwater to pass through the site with minimal effect on the conveyance routes. Therefore, mitigation measures are not required.

There will be no increase in built footprint or raising of ground levels within the 1 in 100 year (+12%) and 1 in 100 year (+15%) flood outlines. Therefore, as per the Environment Agency advice contained within their letter dated the 25th September 2023 level for level floodplain compensation will not be required.

Table 9 - Existing Ground Levels at the Location of the Proposed Buildings and Corresponding Water Levels (mAOD)

Building	Existing Ground Level	1 in 100 Year (+12%)	1 in 100 Year (+15%)
Eastern Portion of A	8.68	8.51 (floodplain 3)	8.63 (floodplain 3)
Eastern Portion of A	8.84	8.75 (floodplain 1)	8.78 (floodplain 1)
B	9.30	8.75 (floodplain 10)	8.84 (floodplain 10)
C	9.00	Nil Return	Nil Return

As per Page 17 of the SFRA the proposed development will result in a net reduction in flood risk and will ensure that floodplain storage and flow routes are not affected by:

1. Maintaining a similar built area compared to the existing situation.
2. Raising finished floor levels above the design flood level, which is an improvement on the existing situation.
3. Reduce surface water runoff rates and volumes from the site compared to the existing situation.
4. Maintain floodplain storage capacity.
5. Create space for flooding.
6. Propose minimal impedance to floodwater flow.
7. Incorporate flood resilient and/or resistance measures.
8. Ensure the development remains safe for users in time of flood.

The proposed development will have no detrimental impact on flood risk while also improving the access to the River Ember and its banks for maintenance.

5.0 FLOOD RISK MANAGEMENT

5.1 Introduction

The flood risk at this location is considered suitable for 'more vulnerable' developments 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.

A number of techniques and mitigation strategies to manage and reduce the overall flood risk in the area will be used. 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 property level protection measures these are discussed in more detail below.

5.2 Sequential Approach

The sequential approach has been applied within the site by locating the most vulnerable elements of the development in the lowest risk areas. The proposed buildings will be located on the higher parts of the site, at a lower risk of flooding.

5.3 Finished Floor Levels

The finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD and the basement entrance/s will have a threshold level of 9.40mAOD these will provide more than adequate freeboards above the maximum 1 in 100 year (+12%) water level for the site which 8.75mAOD and the maximum 1 in 100 year (+15%) water level for the site which 8.84mAOD.

For the buildings a minimum freeboard of 0.70m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.61m above the 1 in 100 year (+15%) event will be provided. For the basement entrance/s a minimum freeboard of 0.65m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.56m above the 1 in 100 year (+15%) event will be provided. Raising the finished floor levels and the basement entrance will also provide protection against exceedance events.

A combination of resistance (proofing) and resilience measures will be included to provide further protection. This is discussed below.

5.4 First Floor Accommodation

Accommodation will be located on the first floor and above as well as the ground floor of the buildings. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be 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.

5.5 Flood Resilience and Resistance Measures

The development of the layout should always consider that the site is potentially at risk from an extreme event and as such the implementation of flood resilience and resistance methods should be assessed.

To make the buildings more resistant to seepage the following measures will be incorporated. Sealant will be used around external doors and windows. All external doors and windows will be constructed from durable materials and the walls of the buildings will be thick.

To improve the buildings resilience to flooding the following measures will be incorporated. All electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor level of the house. Non-return valves will be fitted to the drains within the last manhole before discharge of water off the site.

5.6 Food Warning

The site is located in a flood risk area therefore; the buildings will participate in the Environment Agency flood warning telephone service. The site will register contact details with the Environment Agency' Flood Warnings Service.

The Environment Agency operate a free flood warning service providing alerts by phone, text or email when flooding is anticipated providing an opportunity for 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 of the site will be made aware of the Environment Agency Floodline telephone number (Call Floodline on 0345 988 1188) and the Flood Warning Codes and their meaning. The Environment Agency uses 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. The flood warning will be passed onto the 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 Warning and Evacuation Plan

A Flood Warning and Evacuation Plan (FWEP) outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may has been developed (see Appendix 4).

Sensible precautions would include raising electrical items, irreplaceable items and sentimental 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 practising using the access and egress routes and preparing a flood kit in advance containing warm clothing, medication, a torch, food and wellingtons.

The FWEP 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 FWEP 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.

Flood levels will be monitored; occupants and visitors will be informed. The flood warning will be passed onto the occupants and visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required. If required a 'safe haven' on the first floor 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 dwellings 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 Elmbridge Borough Council Flood Risk SPD confirms that Elmbridge Borough Council's policy (see page 43 of the SPD) is that a safe access/egress route *"...should allow occupants to safely exit and enter the buildings via a 'dry' route above 1 in 100 year event to reach land outside the flooded area (e.g. Flood Zone 1) using public rights of way without the intervention of the emergency services or others. Where this is not possible, a route through limited depths of flooding may be acceptable taking account of flow depth and velocity (flood hazard). This is a particularly important consideration for sites located on a 'dry island' or where a change of use is proposed."*

The ground level at the entrance to the site is 9.73mAOD. Therefore, dry access and egress from the site will be possible for all events up to and including the 1 in 100 year (+20%) event. Furthermore, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides a more than adequate freeboard above the floodwater levels.

People should make their way to areas outside of the flood zone via Orchard Lane and Esher Lane (B3379) to the north. Facilities such as cafes, shops etc. are located to the north of the site which may be used in the event of a flood event. A safe access and egress route, including emergency access can be maintained for vehicles and/or by foot, as shown in Figure 13. 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 mechanism for flooding from the River Ember is generally prolonged episodes of heavy rainfall, which affords good time for flood warnings to be issued. The likelihood of a rapid river level rise within the River Ember and possible rapid inundation of urban areas within this area and posing a risk to life is considered to be minimal. This is primarily due to the large River Ember system and its substantial upper contributing catchment area which allows the Environment Agency, with its current flood warning system, to provide 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.

Given the nature of fluvial flooding and the Environment Agency's Flood Warning Service, occupants should be able to seek prior evacuation to the place of safe refuge before flood waters reach the site, or worst case refuge on the first floor level. The Safe Access and Egress Route shown in Figure 13 indicates the exit routes that all people (i.e. occupants and visitors) on site should follow once a flood warning has been received.

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 13. Therefore, safe access and egress can be maintained in accordance with the NPPF, Environment Agency and the Elmbridge Borough Council Guidance.

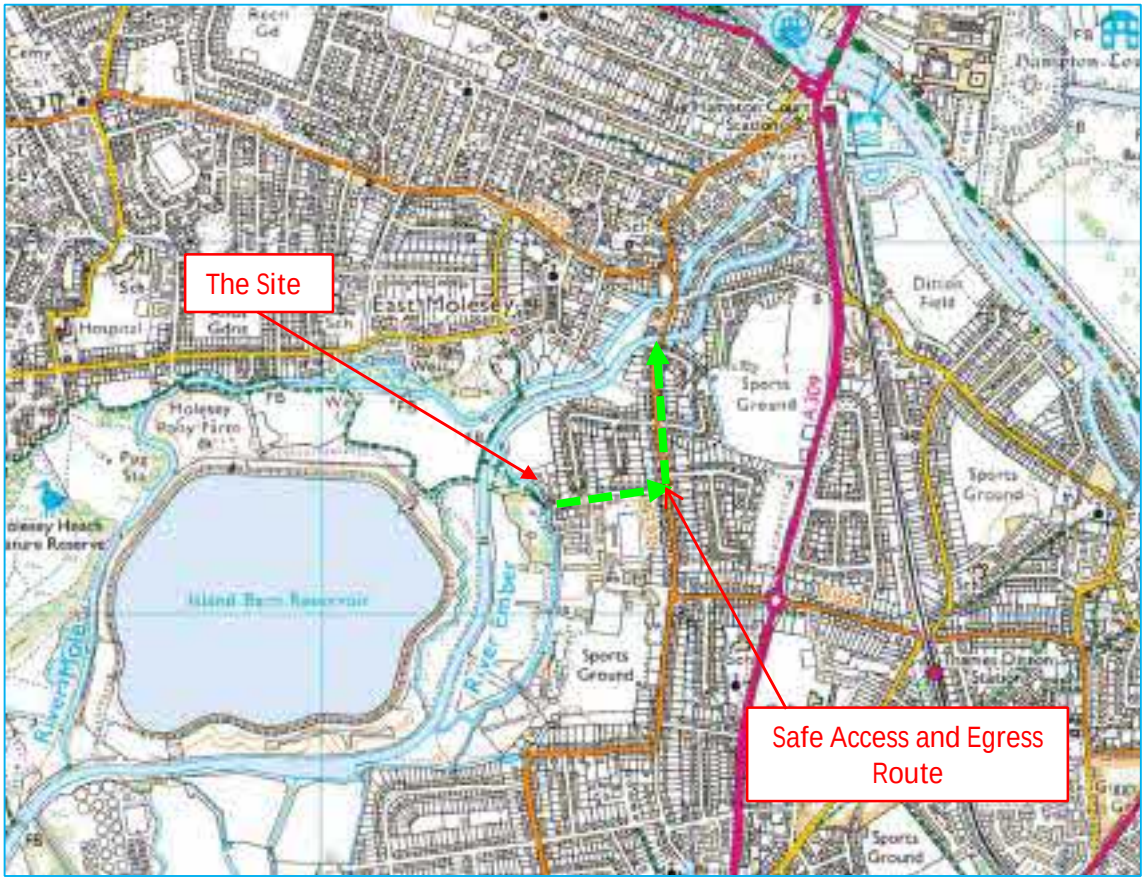


Figure 13 - Safe Access and Egress Route

5.9 Flood Warning Codes / Flood Evacuation Procedures

In order for the following evacuation procedures to be effective:

The house 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/Alerts.

The flood warning will be passed onto the visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

Flood Alert

'Flooding of low-lying land and roads is expected. Be aware, be prepared, watch out!'.

The Environment Agency will issue a Flood Alert status when flooding is possible, based upon weather and river/sea conditions. Be prepared to act on your flood plan. At this stage occupants and visitors should make themselves aware of the Flood Plan and evacuation routes. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast.

Flood Warning

'Flooding of homes and businesses is expected. Act now!'.

The Flood Warning alert will be issued when water levels are rising, and further rain is expected. The site will be evacuated. Move family, pets and valuables to a safe place.

Safe access and egress, including emergency access can be maintained for vehicles and/or by foot. Water, electricity and gas supplies should be located and switched off before evacuating. The Environment Agency Floodline on 0845 988 1188 to get more information should be contacted to get more information, periodically and listen to and watch for weather and flood warnings on local radio and television stations.

Severe Flood Warning

'Severe Flooding is expected. There is extreme danger life and property. Act now!'.

If the site has not already been evacuated, it will be evacuated immediately. Co-operate with the emergency services and call 999 if immediately in danger. Safe access and egress, including emergency access can be maintained for vehicles and/or by foot.

Warning No Longer in Force

'Flood Watches or Flood Warnings are no longer in force for this area'.

Occupants and visitors should contact the Elmbridge Borough Council to check that it is safe to return to the site. Please be careful water may be around for several days. If there is any doubt that appliances may be water damaged, they must be checked before switching the power or gas back on.

Contact your insurance company as soon as possible to get their approval before arranging any clean-up or repairs.

5.10 Buffer Zone

A minimum of an 8m buffer zone adjacent to the top of the River Ember will be retained, as shown in Figures 14 and 15. Along the majority of the river reach a buffer zone of greater than 8m is achieved with the majority of structures being over 10m away from the river and all new buildings being over 9.30m from the river. The existing building/s to be demolished are located within 7m of the top of bank of the River Ember. The proposed development will provide betterment compared to the existing situation by increasing the size of the buffer zone.

The buffer zone will allow access and maintenance while also mitigating the impact of flooding from the River Ember should it overtop its banks. Hardstanding will not be located within 8m of the river area and there will be no artificial lighting within 8m of the river. All planting will be locally native species as recommended by the Environment Agency. A construction Environmental Management Plan and Landscape Management plan have also been prepared to support best practice and maintenance of the biodiverse water corridor.

Access to the River Ember has also been improved as part of the proposed development by function of the development layout. The proposed development will not only improve the access to the river for the Environment Agency for maintenance purposes but also for residents of the site via improvements to the existing landscaped area.

5.11 Residual Risk

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.

Figure 14 - Plan View of Buffer Zone

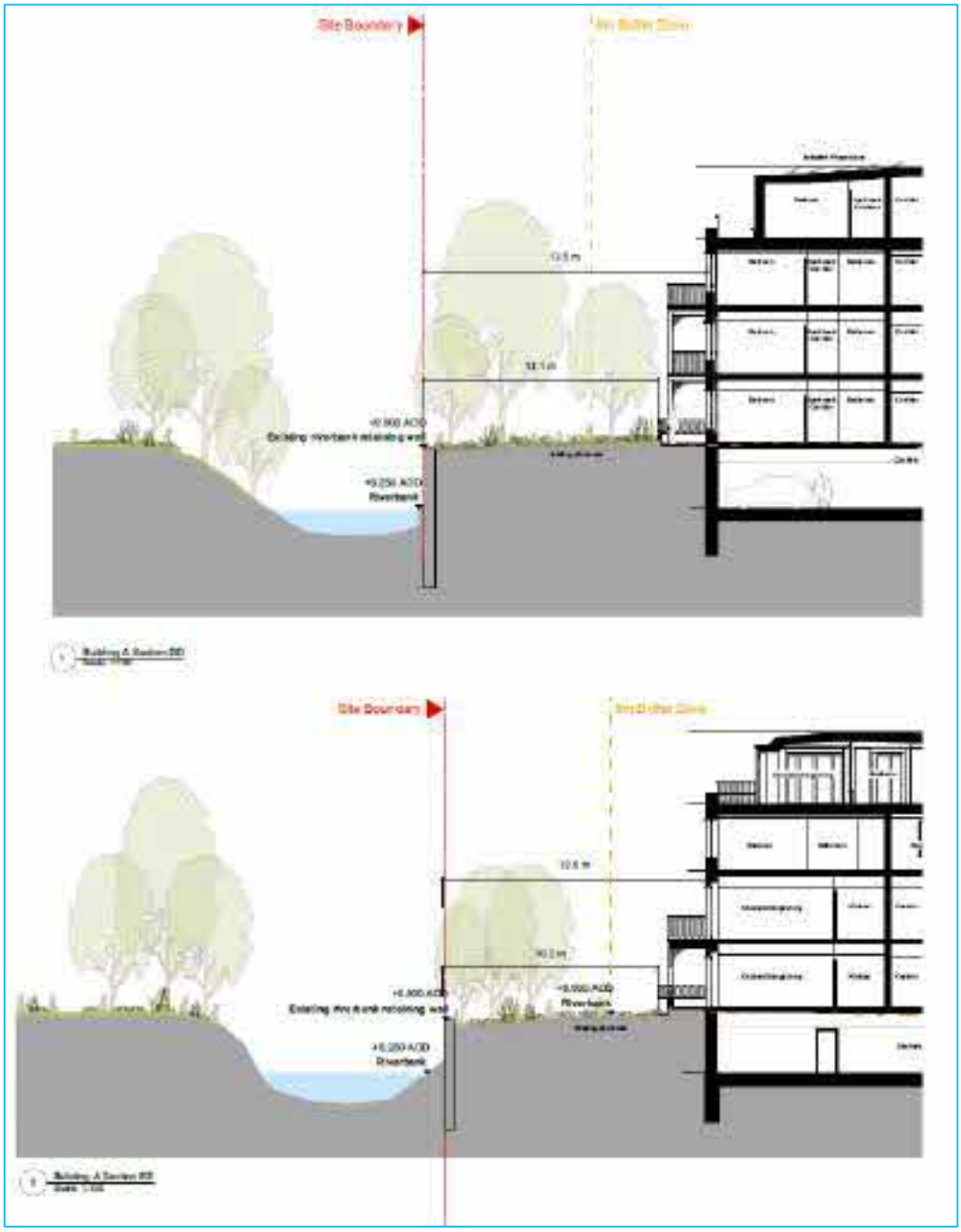


Figure 15 - Cross Section of Buffer Zone

6.0 SEQUENTIAL AND EXCEPTION TESTS

6.1 Sequential Test

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). The Site Allocations section (Chapter 9) of the LPA's emerging Local Plan, confirms that the application site (reference D6/US462) is proposed to be allocated for the delivery, within 1-5 years, of 61 additional residential units (i.e. in addition to the existing units). The site should, therefore, be deemed to have passed the Sequential Test.

Furthermore,, the proposal is for the replacement of an existing site. The replacement of an existing buildings with a new, suitably flood-resilient design is preferable to the existing building as the exposure of people or property to flooding will be minimised.

The proposed development will not change the vulnerability of the site or introduce a new 'more vulnerable' developments into the floodplain. The proposed development will improve the sites resilience, resistance to flooding and by using property level protection measures to protect the site from flooding the vulnerability of the site will be improved (see Section 5.0).

The existing buildings within the application site are of minimal architectural merit, are no longer fit for purpose. Furthermore, the Council's objectives are to sustain and enhance the vitality and viability of the region, and to ensure a wide range of homes to which people have easy access by a range of transport therefore, improving the overall quality of life. This is underpinned by the quality of the physical environment, social well-being and economic and environmental improvements. The Council seeks to grant permission for developments that add to the vitality and viability of the region.

This site will help to regenerate the region and will help to deliver these objectives. This site will help encourage economic impetus that will in turn help deliver a stronger service function and mix of residential uses.

The site proposals remain consistent with the relevant planning policies and are not at odds with the current use of the site and can only enhance and preserve the employment base which currently exists. The wider area surrounding the proposed development site is affected by a very similar, and in many cases, higher risk of flooding.

Similar developments on any site outside a Flood Zone will not offer any advantage vis-a-vis flooding. Consequently, application of the Sequential Test demonstrates that there is no measurable advantage to constructing the proposed development elsewhere.

The sequential approach has been applied within the site by locating the most vulnerable elements of the development in the lowest risk areas. The proposed buildings will be located on the higher parts of the site, away from the River Ember, at a lower risk of flooding.

In summary, the development proposals should therefore be considered by the LPA to satisfy the Sequential Test as set out in the NPPF.

6.2 Exception Test

If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding; the Exception Test can be applied if appropriate. For the Exception Test to be passed:

it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and

a site-specific flood risk assessment must demonstrate the site will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Paragraphs 163 to 165 of the NPPF deal with the Exception Test. It states:

"The application of the Exception Test should be informed by a strategic or site specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Both elements of the Exception Test should be satisfied for development to be allocated or permitted."

More detailed guidance is set out in the PPG. Under the heading 'Manage and mitigate flood risk' the Guidance advises that:

"where development needs to be in locations where there is a risk of flooding as alternative sites are not available, local planning authorities and developers [should] ensure development is appropriately flood resilient and resistant, safe for its users for the development's lifetime, and will not increase flood risk overall."

6.3 Wider Sustainability Benefits

The key emphasis of the NPPF is to achieve sustainable development. The NPPF provides the following aims under the umbrella of sustainable development:

1) Building a strong, competitive economy
2) Ensuring the vitality of town centres
3) Supporting a prosperous rural economy
4) Promoting sustainable transport
5) Supporting high quality communications infrastructure
6) Delivering a wide choice of high quality homes
7) Requiring good design
8) Promoting healthy communities
9) Protecting Green Belt land
10) Meeting the challenge of climate change, flooding and coastal change

11) Conserving and enhancing the natural environment

12) Conserving and enhancing the historic environment

13) Facilitating the sustainable use of mineral

The Councils' policies make clear for the need to focus on new development in locations which are accessible and sustainable, making use of existing infrastructure and community facilities and services. There is an important need within this area for affordable housing, which is suitable for a wide variety of people.

The proposed use reflects Planning Policy (National, Regional, and Local) with respect to encouraging residential housing. The site is allocated for residential uses within the Local Plan. The Councils' policies make clear for the need to focus on new development in locations which are accessible and sustainable, making use of existing infrastructure and community facilities and services. There is an important need for residential housing within this area. There is an identified need for new land releases to meet future housing needs and accordingly there is a sound and strong planning reason for bringing the site forward.

The development will see disused land come forward for redevelopment and will be actively used and has presented the opportunity to create a quality affordable and sustainable development. This area is a sustainable location to accommodate new development in terms of the facilities it offers. The settlement hierarchy within the Local Plan guides the distribution and scale of development in a sustainable manner, reflecting the needs, roles and functions of each settlement. New development should support or improve its role as a focus for social and economic activity. Many local facilities and services are inside the ideal walking distances from the site meaning that there is potential to reduce the need to travel by car.

The site is sustainable and within walking distance of the local community and services. There is a need for the proposed development in this area, particularly in view of the facilities available, allowing easy access to the existing facilities. The scheme will also see the integration of modern methods of construction, minimising future energy use. The design is also actively seeking to minimise the embedded carbon footprint within the construction materials.

The development of the site will improve the appearance of the site and make a positive contribution to as well as providing much needed homes in a highly sustainable location well-served by public transport and close to local facilities. The existing transport infrastructure will be utilised and there will be no need for new infrastructure near the site.

Development on this site will generate employment during the construction period and thereby provide some protection to the local economy. It may also support those who provide services to homes (e.g. window cleaners and maintenance tradesmen). It is considered that the proposals for the site offers both environmental and economic benefits which accord with the principles of design and sustainable development, as set out in the NPPF. The proposed development will contribute to the economic function of the local community.

It is considered that the proposals for the site offers both environmental and economic benefits which accord with the principles of design and sustainable development, as set out in the NPPF. The site will contribute to reducing emissions by providing environmentally friendly facilities. The site accords with the NPPF to assert a presumption that appropriate development may be allowed in settlement boundaries.

In respect of landscape impact and effect the scheme aims to conserve and enhance the character of the landscape. The proposals would not materially impact on the character of the landscape therefore, it would be preserved and improved. The landscape impact will be low on this site and surrounding area already has the infrastructure to deal with residential development.

A minimum of an 8m buffer zone adjacent to the top of the River Ember will be retained,. Along the majority of the river reach a buffer zone of greater than 8m is achieved with the majority of structures being over 10m away from the river and all new buildings being over 9.30m from the river. The existing building/s to be demolished are located within 7m of the top of bank of the River Ember. The proposed development will provide betterment compared to the existing situation by increasing the size of the buffer zone.

The buffer zone will allow access and maintenance while also mitigating the impact of flooding from the River Ember should it overtop its banks. Hardstanding will not be located within 8m of the river area and there will be no artificial lighting within 8m of the river. All planting will be locally native species as recommended by the Environment Agency. A construction Environmental Management Plan and Landscape Management plan have also been prepared to support best practice and maintenance of the biodiverse water corridor.

Access to the River Ember has also been improved as part of the proposed development by function of the development layout. The proposed development will not only improve the access to the river for the Environment Agency for maintenance purposes but also for residents of the site via improvements to the existing landscaped area.

In conclusion, it is felt that the development will have wider sustainability benefits to the community that outweigh flood risk. The site is well located within the community and settlement boundary. It will help the growth of the regional economy and will provide direct and indirect employment opportunities. The proposed development will assist the Council in meeting an identified need for residential housing through the re-use of a brownfield site within a highly sustainable location. The proposed development incorporates a number of mitigation measures; these works to reduce the flood risk on the site will enhance the sustainability of the site for the wider community.

The added material benefit is the contribution that this site will make to the Councils' supply position in full compliance with the emerging strategic policy. There is an identified need for the proposed development to meet future needs and accordingly there is a sound and strong planning reason for bringing the site forward.

The development proposals should therefore be considered by the LPA to satisfy the first condition of the Exceptions Test as set out in the NPPF. The development proposal sufficiently provides wider sustainability benefits to the community, that outweigh the potential flood risk. As per the NPPF this planning application can be approved as the site is considered to be sustainable with no other over riding issues.

6.4 Safe, Without Increasing Flood Risk Elsewhere

This FRA has demonstrated that the development will be safe, without increasing flood risk elsewhere. The proposed development will not change the vulnerability of the site or introduce a new 'more vulnerable' developments into the floodplain. The proposed development will improve the sites resilience, resistance to flooding and by using property level protection measures to protect the site from flooding the vulnerability of the site will be improved (see Section 5.0).

The development proposals should be considered by the LPA to satisfy the Exception Test as set out in the NPPF.

6.5 Summary

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

7.0 SUMMARY AND CONCLUSIONS

7.1 Introduction

This report presents an FRA in accordance with the NPPF for the proposed development at The Molesey Venture Centre.

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 principal flood risk posed to the site is from fluvial flooding from the River Thames. The site is located within Flood Zones 1, 2 and 3. The majority of the site is located within Flood Zones 1 and 2 with the south of the site being located within Flood Zone 1 which has a 'low probability' of river flooding with less than 1 in 1000 annual probability of river flooding in any year (<0.1%). The north of the site is located within Flood Zone 2 with a 'medium probability' of river flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

A small area of the site to the west, immediately adjacent to the River Ember, is located within Flood Zone 3 with a 'high probability' of river flooding, with a 1 in 100 or greater annual probability of river flooding (>1%) in any year. However, this is located within the river corridor and is outside of the developable area of the site.

By comparing the modelled water levels for the River Thames, which has only recently been supplied by the Environment Agency to the topographical survey, it has been shown that the site will in fact not be inundated with floodwater during the 1 in 100 year (+12%) and 1 in 100 year (+15%) events. The ground levels taken from the topographical survey are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for the corresponding locations. For floodplain nodes 1, 3 and 10 the ground levels are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for these locations.

The ground levels at floodplain node 1 are located 0.06m above the corresponding water level of 8.78mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 3 are located 0.02m above the corresponding water level of 8.63mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 10 are located 0.46m above the corresponding water level of 8.75mAOD for the 1 in 100 year (+15%) event.

Furthermore, the majority of ground levels being above 9.00mAOD and rising to 9.90mAOD on the site. The ground level at the entrance to the site is 9.73mAOD. As noted above, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides an adequate freeboard above the undefended 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

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 and the risk of fluvial flooding is considered to be of medium significance. A number of secondary flooding source has been identified which may pose a low significant risk to the site. These are:

Surface Water Flooding

Sewer Flooding

The flooding sources will only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site. 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.

The proposed development will not change the vulnerability of the site or introduce a new 'more vulnerable' developments into the floodplain and will provide betterment compared to the existing situation. 'More vulnerable' uses are appropriate within Flood Zones 1, 2 and 3 after the completion of a satisfactory FRA.

The application is for a new, suitable flood-resilient design. The exposure of people and property will be reduced and minimised compared to existing site conditions. The chance of flooding each year is low each year. This takes into account the effect of any flood defences that may be located within the vicinity of the site as well property level protection measures.

7.3 Implications of the Development on Flood Risk

The ground levels taken from the topographical survey are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for the corresponding locations. For floodplain nodes 1, 3 and 10 the ground levels are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels for these locations. Therefore, based on the topographical survey of the site, the site will in fact not be inundated with floodwater during the 1 in 100 year (+12%) and 1 in 100 year (+15%) events.

The ground levels from the topographical survey provide a much accurate representation of the site ground levels compared to the LiDAR data used within the Environment Agency's modelling. By comparing the modelled water levels to the topographical survey a much more accurate representation of the flood risk posed to the site is shown. This method shows the flood risk in more detail.

The ground levels at floodplain node 1 are located 0.06m above the corresponding water level of 8.78mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 3 are located 0.02m above the corresponding water level of 8.63mAOD for the 1 in 100 year (+15%) event. The ground levels at floodplain node 10 are located 0.46m above the corresponding water level of 8.75mAOD for the 1 in 100 year (+15%) event.

The existing ground levels at the locations of the proposed buildings are shown in Table 9. The exiting ground levels at the locations of the proposed buildings are above the 1 in 100 year (+12%) and 1 in 100 year (+15%) water levels.

There are no buildings proposed near the location of floodplain 3 to the north east of the site. The existing ground level at the location of the nearest proposed building (i.e. eastern portion of building A) to floodplain node 3 is 8.68mAOD, the 1 in 100 year (+15%) water level at floodplain node 3 is 8.63mAOD. The existing ground levels of the nearest proposed building to floodplain node 3 is well above the 1 in 100 year (+15%) water level.

The existing ground level at the location of the western portion of building A is 8.84mAOD and the corresponding 1 in 100 year (+15%) water level is 8.78mAOD. The existing ground level is 0.06m above the 1 in 100 year (+15%) water level for this location.

The existing ground level at the location of the proposed building B is 9.30mAOD and the corresponding 1 in 100 year (+15%) water level is 8.84mAOD. The existing ground level is 0.46m above the 1 in 100 year (+15%) water level for this location.

A minimum of an 8m buffer zone adjacent to the top of the River Ember will be retained. Along the majority of the river reach a buffer zone of greater than 8m is achieved with the majority of structures being over 10m away from the river and all new buildings being over 9.30m from the river. The existing building/s to be demolished are located within 7m of the top of bank of the River Ember. The proposed development will provide betterment compared to the existing situation by increasing the size of the buffer zone.

The proposed development proposes minimal new structures compared to the existing situation and will therefore allow floodwater to pass through the site with minimal effect on the conveyance routes. Therefore, mitigation measures are not required.

There will be no increase in built footprint or raising of ground levels within the 1 in 100 year (+12%) and 1 in 100 year (+15%) flood outlines. Therefore, as per the Environment Agency advice contained within their letter dated the 25th September 2023 level for level floodplain compensation will not be required.

7.4 Flood Risk Management

The flood risk at the site will be reduced by property level protection measures these are discussed in more detail below.

Sequential Approach: The sequential approach has been applied within the site by locating the most vulnerable elements of the development in the lowest risk areas. The proposed buildings will be located on the higher parts of the site, at a lower risk of flooding.

Finished Floor Levels: The finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD and the basement entrance/s will have a threshold level of 9.40mAOD these will provide more than adequate freeboards above the maximum 1 in 100 year (+12%) water level for the site which 8.75mAOD and the maximum 1 in 100 year (+15%) water level for the site which 8.84mAOD.

For the buildings a minimum freeboard of 0.70m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.61m above the 1 in 100 year (+15%) event will be provided. For the basement entrance/s a minimum freeboard of 0.65m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.56m above the 1 in 100 year (+15%) event will be provided. Raising the finished floor levels and the basement entrance will also provide protection against exceedance events.

A combination of resistance (proofing) and resilience measures will be included to provide further protection. This is discussed below.

First Floor Accommodation: Accommodation will be located on the first floor and above as well as the ground floor of the buildings. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be 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 Resilience and Resistance Measures: To make the buildings more resistant to seepage the following measures will be incorporated. Sealant will be used around external doors and windows. All external doors and windows will be constructed from durable materials and the walls of the buildings will be thick.

To improve the buildings resilience to flooding the following measures will be incorporated. All electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor level of the house. Non-return valves will be fitted to the drains within the last manhole before discharge of water off the site.

Flood Warning: The site is located in a flood risk area therefore; the buildings will participate in the Environment Agency flood warning telephone service. The site will register contact details with the Environment Agency' Flood Warnings Service.

Flood Warning and Evacuation Plan: A FWEP outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may has been developed.

Safe Access and Egress Route: The Elmbridge Borough Council Flood Risk SPD confirms that Elmbridge Borough Council's policy (see page 43 of the SPD) is that a safe access/egress route *"...should allow occupants to safely exit and enter the buildings via a 'dry' route above 1 in 100 year event to reach land outside the flooded area (e.g. Flood Zone 1) using public rights of way without the intervention of the emergency services or others. Where this is not possible, a route through limited depths of flooding may be acceptable taking account of flow depth and velocity (flood hazard). This is a particularly important consideration for sites located on a 'dry island' or where a change of use is proposed."*

The site will not be inundated with floodwater during the defended 1 in 100 year (+12%) event, the site has a freeboard of 0.24m above the defended 1 in 100 year (+12%) event therefore, dry access and egress from the site will be possible for all events up to and including the 1 in 100 year (+12%) event. Furthermore, the finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD which provides a more than adequate freeboard above the 1 in 100 year (+12%) event water level of 8.53mAOD.

People should make their way to areas outside of the flood zone via Orchard Lane and Esher Lane (B3379) to the north. Facilities such as cafes, shops etc. are located to the north of the site which may be used in the event of a flood event. A safe access and egress route, including emergency access can be maintained for vehicles and/or by foot. 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.

Given the nature of fluvial flooding and the Environment Agency's Flood Warning Service, occupants should be able to seek prior evacuation to the place of safe refuge before flood waters reach the site, or worst case refuge on the first floor level. 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. Therefore, safe access and egress can be maintained in accordance with the NPPF, Environment Agency and the Elmbridge Borough Council Guidance.

Flood Warning Codes / Flood Evacuation Procedures: The flood evacuation procedures have been developed so that the site can be safely evacuated. The property will participate in the Environment Agency flood warning telephone service. The site will register contact details with the Environment Agency' Flood Warnings Service (Floodline 0345 988 1188) in order to receive Flood Warnings. Flood warning will be passed onto the visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

Buffer Zone: A minimum of an 8m buffer zone adjacent to the top of the River Ember will be retained. Along the majority of the river reach a buffer zone of greater than 8m is achieved with the majority of structures being over 10m away from the river and all new buildings being over 9.30m from the river. The existing building/s to be demolished are located within 7m of the top of bank of the River Ember.

The proposed development will provide betterment compared to the existing situation by increasing the size of the buffer zone.

The buffer zone will allow access and maintenance while also mitigating the impact of flooding from the River Ember should it overtop its banks. Hardstanding will not be located within 8m of the river area and there will be no artificial lighting within 8m of the river. All planting will be locally native species as recommended by the Environment Agency. A construction Environmental Management Plan and Landscape Management plan have also been prepared to support best practice and maintenance of the biodiverse water corridor.

Access to the River Ember has also been improved as part of the proposed development by function of the development layout. The proposed development will not only improve the access to the river for the Environment Agency for maintenance purposes but also for residents of the site via improvements to the existing landscaped area.

7.5 Sequential and Exception Tests

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

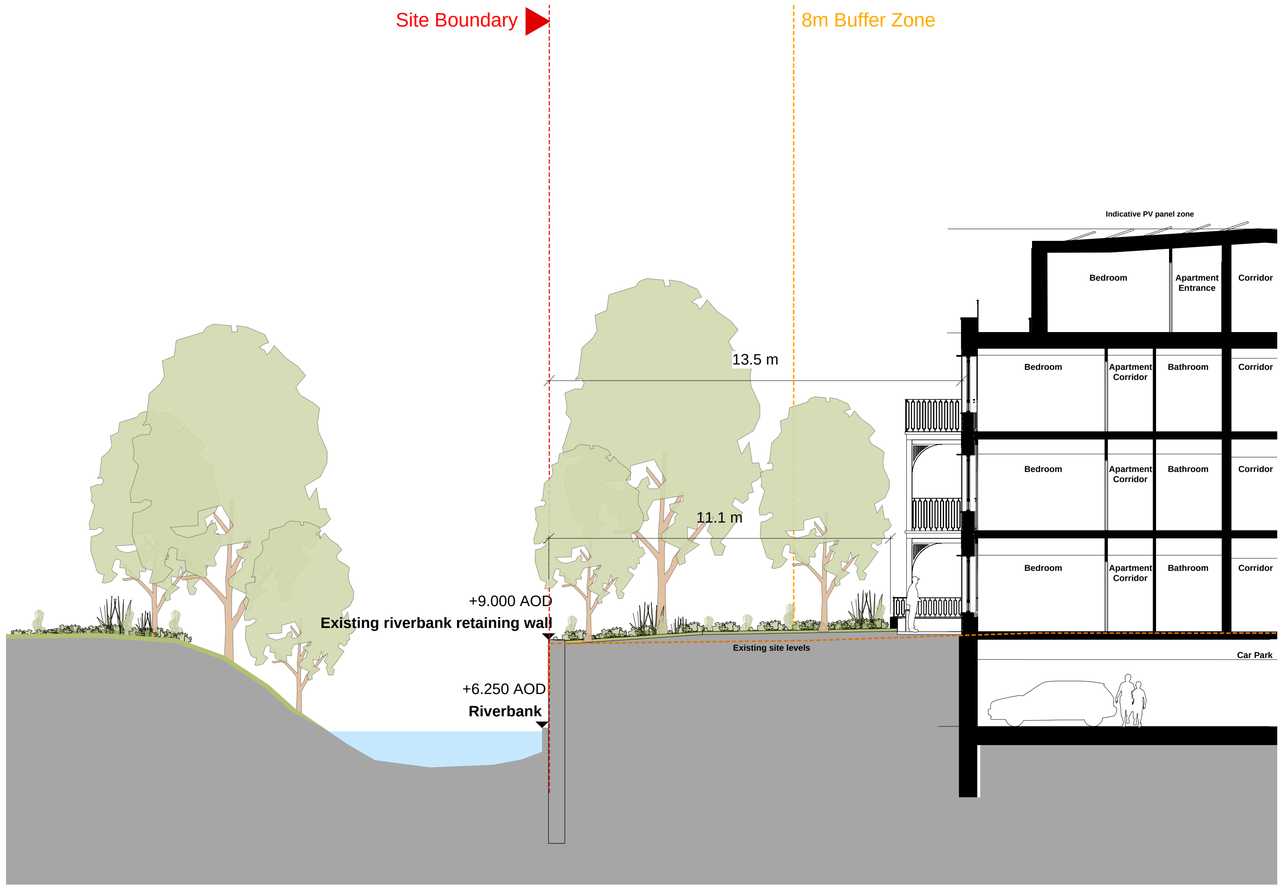
7.6 Conclusion

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 and Elmbridge Council guidance.

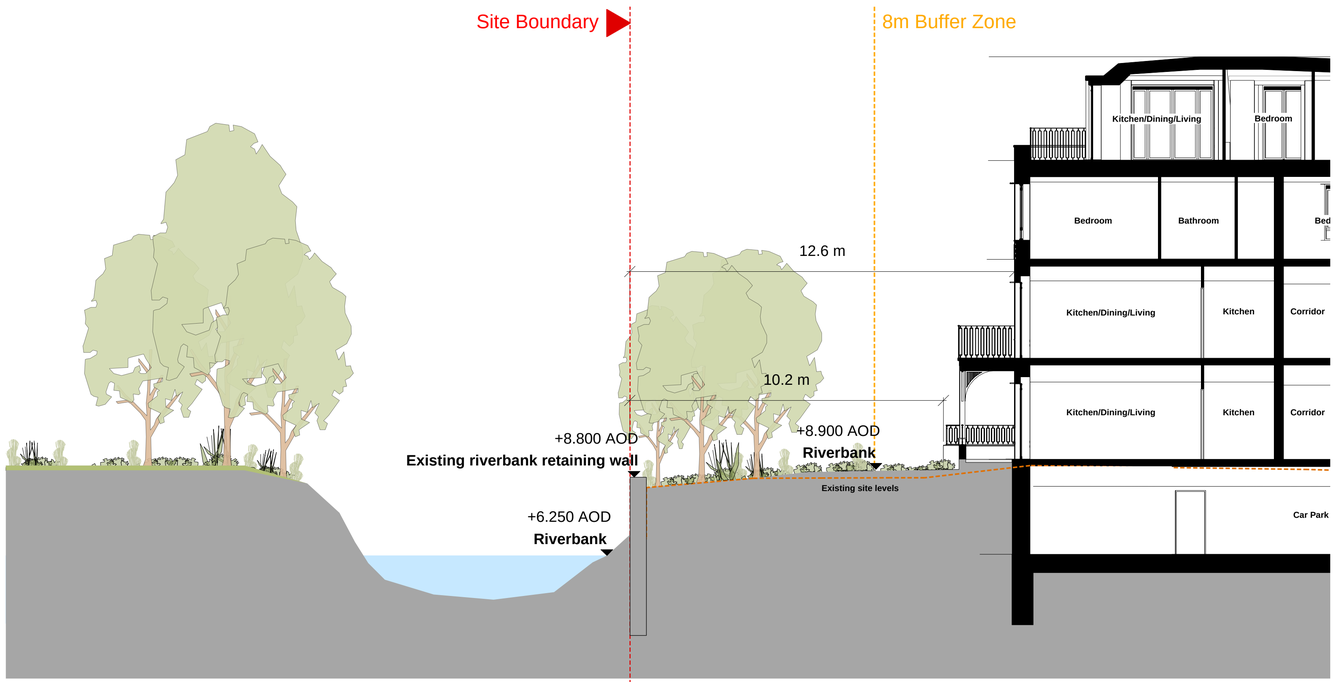
This FRA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk.

APPENDICES

APPENDIX 1 – Existing and Proposed Site Layout



1 Building A Section DD
Scale: 1:100



2 Building A Section EE
Scale: 1:100

General notes

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Drawing revision prefix (not applied to sketches) :
P = Pre-Contract
C = Contract ©

Electronic file reference

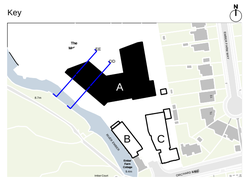
A3711 Orchard Lane SHEETS 300 Sections ALL R6.vwx

Rev	Revision note	Date	Drawn	Check
2	For Information	26/05/23	JG	ES

Material key

- Buff brick
- Light brick
- Stone/GRC or similar
- Slate tiles
- Grey metal

Key



LIFESTYLE RESIDENCES

Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

Proposed Building A Riverside Sections

Scale @ A1	Issue date
1:100	**26/05/23**

Drawing number

A3711-ASA-BA-ZZ-DR-A-0307

Proposed status	Revision
for Planning	**P2**

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Drawing revision prefix (not applied to sketches) :
P = Pre-Contract
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Electronic file reference

A3711 Orchard Lane SHEETS 200 Proposed Plans R6.vwx

Rev	Revision note	Date	Drawn	Check
3	For Information	26/05/23	JG	ES

KEY

- 1 Bed
- 2 Bed
- 3 Bed
- Amenity
- Residential Lobby
- Back of House
- Diverted Thames Water main
- Existing buildings footprint

Key

Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

**Proposed Site Wide
Riverside building proximity study**

Scale @ A1	Issue date
1:250	**26/05/23**

Drawing number

A3711-ASA-ZZ-00-DR-A-0225

Proposed status	Revision
for Information	**P3**

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General notes

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Drawing revision prefix (not applied to sketches) :
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C = Contract ©

Electronic file reference

A3711 Orchard Lane SHEETS 200 Proposed Plans R6.vwx

Rev	Revision note	Date	Drawn	Check
3	For Information	26/05/23	JG	ES

KEY

- 1 Bed
- 2 Bed
- 3 Bed
- Amenity
- Residential Lobby
- Back of House
- Diverted Thames Water main
- Existing buildings footprint

Key

Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

**Proposed Site Wide
Riverside plan**

Scale @ A1	Issue date
1:100	**26/05/23**

Drawing number

A3711-ASA-ZZ-00-DR-A-0226

Proposed status	Revision
for Information	**P3**

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General notes

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Drawing revision prefix (not applied to sketches) :
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Electronic file reference

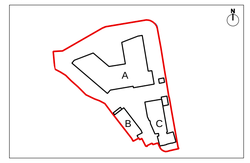
A3711 Orchard Lane SHEETS 200 Proposed Plans R6.vwx

Rev	Revision note	Date	Drawn	Check
2	Planning Addendum	26/05/23	JG	ES

KEY

- Landscaping - 2,972 sq m
- Landscaping - green roofs - 250 sq m
- Hardscape - building footprint - 2,575 sq m
- Hardscape - landscape - 970 sq m
- Hardscape - permeable paving - 740 sq m

Key



Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

Footprint plan proposed

Scale @ A1	Issue date
1:250	**26/05/23**

Drawing number

A3711-ASA-ZZ-ZZ-DR-A-0221

Proposed status	Revision
for Information	**P2**

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Electronic file reference

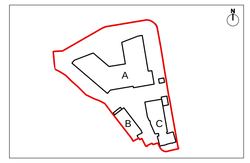
A3711 Orchard Lane SHEETS 200 Proposed Plans R6.vwx

Rev	Revision note	Date	Drawn	Check
1	For information	25/04/23	AS	ES

KEY

- Landscaping - 3,783 sq m
- Hardscape - building footprint - 1,484 sq m
- Hardscape - landscape - 2,240 sq m

Key



Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

Footprint plan existing

Scale @ A1: **1:250**

Issue date: **25/04/23**

Drawing number

A3711-ASA-ZZ-ZZ-DR-A-0222

Proposed status: **for Information**

Revision: **P1**

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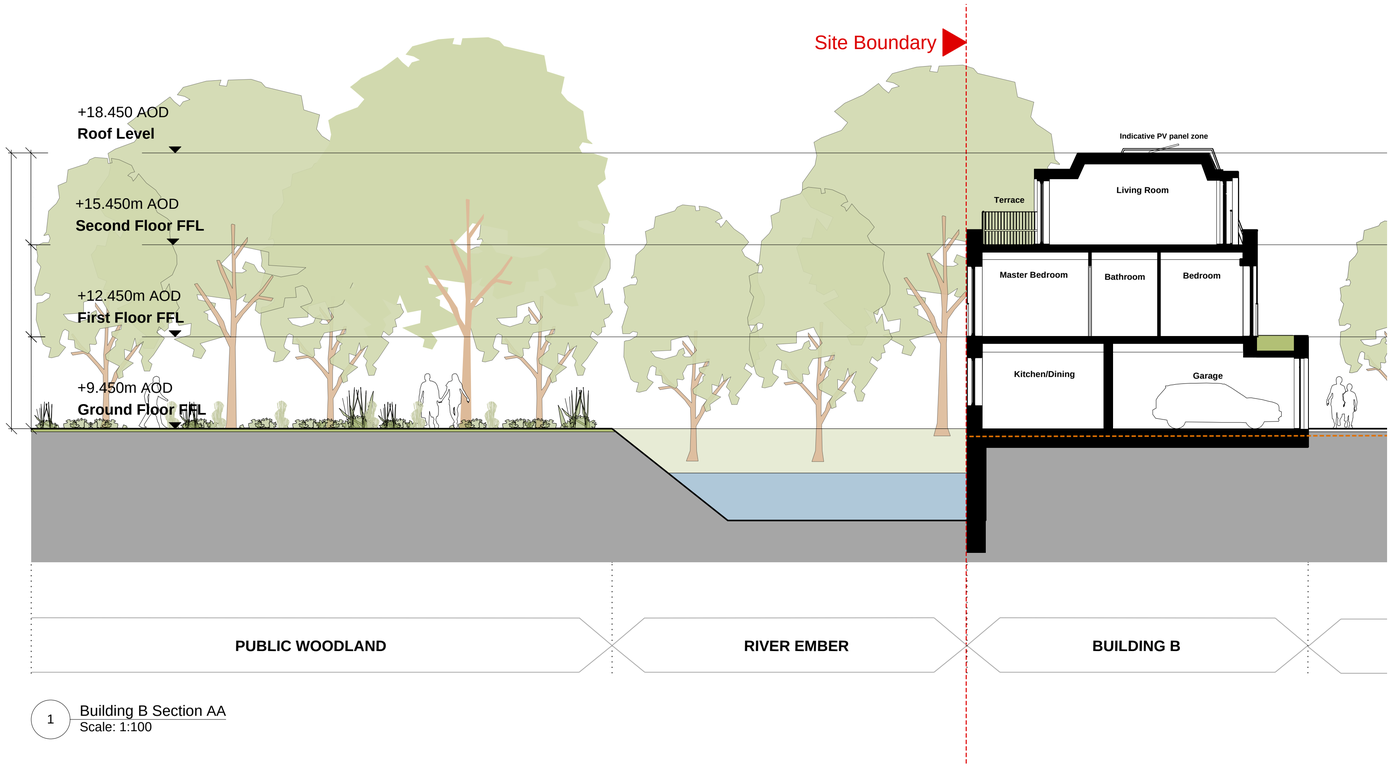

1 Building B Section AA
Scale: 1:100

General notes

This drawing must not be scaled. This drawing must not be used for land transfer purposes. This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register. Areas are measured and calculated generally in accordance with the Nationally Described Space Standard and/or RICS Property Management, 2nd Edition (2018) and have been calculated in metric units. All setting out, dimensions and levels must be checked on site. Levels refer to Ordnance Datum Newlyn, unless stated otherwise. This drawing must not be used on site unless issued for construction. Refer to Information Plan for definition of drawing status.

Drawing revision prefix (not applied to sketches) :
P = Pre-Contract
C = Contract

Electronic file reference

A3711 Orchard Lane SHEETS 300 Sections ALL R2.vwx

Rev	Revision note	Date	Drawn	Check
6	For Planning	12/10/22	JG	AS

Material key

- Buff brick
- Light brick
- Stone/GRC or similar
- Slate tiles
- Grey metal

Key

Client

Lifestyle Residences Ltd

Project title

**A3711 Orchard Lane,
East Molesey**

Drawing title

Proposed Site Wide Sections

Scale @ A1: **1:250**

Issue date: **12/10/22**

Drawing number

A3711-ASA-ZZ-ZZ-DR-A-0308

Proposed status: **for Planning**

Revision: **P6**

Discipline

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LEGEND

SITE BOUNDARY

HARD LANDSCAPE

- S01A SURFACE TYPE 01A: PERMEABLE PAVING TO FOOTPATHS
- S01B SURFACE TYPE 01B: PERMEABLE PAVING TO VEHICULAR AREAS
- S01C SURFACE TYPE 01C: PERMEABLE PAVING TO CARPARKS
- S02 SURFACE TYPE 02: RESIN BOUND GRAVEL TO RESIDENTIAL COURTYARDS
- S03 SURFACE TYPE 03: SELF-BINDING GRAVEL TO RESIDENTIAL COURTYARDS
- S04 SURFACE TYPE 04: PAVERS TO RESIDENTIAL TERRACES
- VENTILATION GRILLES - REFER TO ARCHITECTURAL INFORMATION

SOFT LANDSCAPE

- V01 SPECIES RICH LAWN TURF
- V02 WILDFLOWER LAWN TURF
- V03 AMENITY PLANTING WITH FLOWERING SPECIES
- V05 EXISTING TO BE UPDATED AND IMPROVED

- PROPOSED RETAINED TREE
- PROPOSED REMOVED TREE
- EXISTING ROOT PROTECTION AREA
- PROPOSED TREE

FURNITURE

- FURNITURE TYPE 01: SEATING Streetlife Rough&Ready Benches with back and arm rests
- FURNITURE TYPE 03: CYCLE STANDS Standard Sheffield Stand with tapper tube
- EC01 FURNITURE TYPE 04: BIRD AND BAT BOX

0 10m

North

EXTERIOR ARCHITECTURE

LONDON
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MANCHESTER
Studio 537, The Royal Exchange, St Anns Square, Manchester, M2 7DH

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Client
LIFESTYLE RESIDENTIAL

Rev	Description	Date
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----	----	----
P06	REVISED LAYOUT	24.05.2023
P05	REVISED LAYOUT	05.05.2023
P04	FOR PLANNING	19.10.2022
P03	FOR REVIEW	11.10.2022
P02	FOR REVIEW	05.10.2022
P01	FOR INFORMATION	26.09.2022

Project title
ORCHARD LANE

Drawing title
GENERAL ARRANGEMENT PLAN - GROUND FLOOR

Issued By	London	T: 020 7978 2101	
Scale	1:250 @ A1	Drawn	ExA
Status	PLANNING	Checked	EXA
Date	26.09.2022	Approved	EXA

Drawing number
2241-EXA-XX-GF-DR-L-00101

Revision
P06

P:\LONDON PROJECTS\2022\2241 ORCHARD LANE, EAST MOLESEY\01 BIM\02 CAD\03 SHEET LAYOUT\01 RIBA 1-3 PLANNING\2241-EXA-XX-GF-DR-L-00101.DWG

PARTIAL REMOVAL TO FACILITATE RELOCATION OF THAMES WATER PIPE

PARTIAL REMOVAL TO FACILITATE RELOCATION OF THAMES WATER PIPE

RIVER EMBER

B0-1

B0-2

B0-3

B0-4

C0-1 1B1P 43 sqm

Lobby

Bin Store

Plant Mechanical Stor Intake Room TBC

Plant LV Swi Roo 3000x2000

C0-6 2B3P 61 sqm

C0-7 1B2P 50 sqm

1.1m

LEGEND

- PROPOSED RETAINED TREE
- PROPOSED REMOVED TREE
- PROPOSED REMOVED TREE TO FACILITATE THAMES WATER REALLOCATION
- EXISTING ROOT PROTECTION AREA
- PROPOSED TREE

CATEGORIES OF TREES TO BE REMOVED

CAT B - 10
CAT C - 6
CATEGORY U - 2
PARTIAL REMOVAL - 2

TOTAL - 20

0 10m

North

P:\LONDON PROJECTS\2022\2241 ORCHARD LANE, EAST MOLESEY\01 BIM\02 CAD\03 SHEET LAYOUT\01 RIBA 1-3 PLANNING\2241-EXA-XX-GF-DR-L-00150.DWG

EXTERIOR ARCHITECTURE

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Client
LIFESTYLE RESIDENTIAL

Rev	Description	Date
----	----	----
----	----	----
----	----	----
----	----	----
P06	REVISED LAYOUT	24.05.2023
P05	REVISED LAYOUT	05.05.2023
P04	FOR REVIEW	11.10.2022
P03	FOR REVIEW	05.10.2022
P02	FOR INFORMATION	26.09.2022
P01	FOR INFORMATION	05.07.2022

Project title
ORCHARD LANE

Drawing title
TREE RETAIN + REMOVAL PLAN

Issued By	London	T: 020 7978 2101	
Scale	1:250 @ A1	Drawn	ExA
Status	PLANNING	Checked	EXA
Date	01.07.2022	Approved	EXA

Drawing number
2241-EXA-XX-GF-DR-L-00150

Revision
P06

APPENDIX 2 – Topographical Survey

Note:
Areas drawn indicatively noted and indicated by grey dashed line as line below

SOUTH SITE - SITE PLAN
1:500 Scale

LEVEL DATUM & ORIENTATION

N

LEVELS & DRAWING ORIENTATION CO-ORDIATED TO WORLD CO-ORDINATES USING GPS EQUIPMENT (SPECTRA SP60). PERMANENT STATIONS LOCATED IN POSITIONS INDICATED ON PLAN AS FOLLOWS:-

STN 01-	E-514613.097,	N-167367.800,	HT - 9.309m
STN 02-	E-514613.333,	N-167364.116,	HT - 9.320m
STN 03-	E-514613.590,	N-167360.415,	HT - 9.310m
STN 04-	E-514605.106,	N-167365.862,	HT - 9.198m
STN 05-	E-514632.200,	N-167296.194,	HT - 9.753m
STN 06-	E-514633.288,	N-167286.289,	HT - 9.734m
STN 07-	E-514640.539,	N-167295.300,	HT - 9.811m
STN 08-	E-514637.636,	N-167300.119,	HT - 9.692m
STN 09-	E-514455.230,	N-167405.090,	HT - 9.439m
STN 10-	E-514456.122,	N-167408.178,	HT - 9.431m
STN 11-	E-514449.236,	N-167410.310,	HT - 9.414m
STN 12-	E-514448.346,	N-167406.898,	HT - 9.421

ABBREVIATIONS & LEGEND:

LEVELS & HEIGHTS
CL - COVER LEVEL
IL - INVERT LEVEL
L - LEVEL
HT - HEIGHT
STN - SURVEY STATION
BM - BEAM
CE - CEILING
J - JOISTS
RA - RAFTERS
E - EAVES
F - FENCE
U/S - UNDERSIDE OF
RL - RIDGE LINE
FR - FLAT ROOF
HL - HIP LINE
VL - VALLEY LINE
PW - PARAPET WALL
SL - SLAB
SF - SOFFIT
T - TREE
THR - THRESHOLD
To - TOP OF
W - WALL
HH - HEAD HEIGHT
OH - OPENING HEIGHT
SH - SILL HEIGHT

GENERAL NOTES
AB - ADVERTISING BOARD
AC - AIR CONDITIONING UNIT
AHU - AIR HANDLING UNIT
AP - INTRUDER ALARM PANEL
B - BOLLARD
BA - BARRIER
BE - BENCH
BS - BUS STOP
BLR - BOILER
BXO - BOXING OUT
CAH - CEILING ACCESS HATCH
CHY - CHIMNEY
CPD - CUPBOARD
DB - DOG WASTE BIN
DW - DWARF WALL
DK - DROP KERB
EDB - ELECTRICAL DISTRIBUTION BOARD
EG - EXTRACT GRILLE
EM - ELECTRIC METER
FB - FUSE BOX
FP - FIREPLACE
FU - FLUE
FAP - FIRE ALARM PANEL
GR - GRASS
GU - GUARDING
GM - GAS METER
HWC - HOT WATER CYLINDER
LB - LITTER BIN
LP - LAMP POST
PC - PELICAN CROSSING
PS - PAVING SLABS
PL - PAVEMENT LIGHT
PLT - PLANTING
PB - POST BOX
RG - RAILING
RS - ROAD SIGN
RFL - ROOF LIGHT
SB - SPEED BUMP
SG - SIGNAGE
SN - STREET NAME SIGN
SWR - SHOWER
SHV - SHELVING
TB - TELEPHONE BOX
TL - TRAFFIC LIGHT
TM - TICKET MACHINE
TP - TELEGRAPH POLE
VE - VEGETATION
WA - WATER
WD - WARDROBE
WH - WATER HEATER
ZC - ZEBRA CROSSING

SERVICES
BT - BRITISH TELECOMS
CATV - CABLE TELEVISION
ER - EARTHING ROD
ES - ELECTRICAL SUPPLY
FH - FIRE HYDRANT
GAS - GAS SUPPLY
PO - POST OFFICE TELEPHONE
SV - STOP VALVE
TSSU - TRAFFIC LIGHT SIGNALS

DRAINAGE
DC - DRAINAGE CHANNEL
G - GULLY
I/C - INSPECTION CHAMBER
M/H - MANHOLE
RE - RODDING EYE
RWP - RAIN WATER PIPE
UTL - UNABLE TO LIFT
S+VP - SOIL & VENT PIPE
ST - STOP TAP
WM - WATER METER

TYPICAL DRAWING SYMBOLS
SPOT LEVEL — 96.256
SPOT HEIGHT — ToW 99.034
SURVEY STATION — STN 01 E: 232193.251 N: 515743.694 HT: 95.142
MANHOLE / INSPECTION CHAMBER — I/C CL=96.256 IL=94.824
SURVEY HEIGHT — H=2.704
WINDOW TAG — WINDOW 015 HH=1.962 OH=0.747 SH=1.215
DOOR TAG — DOOR 009 OH=1.820
RADIATOR TAG — RADIATOR 005 TH=0.238 RH=0.538 BH=0.200
TOP & BOTTOM OF KERB — 34.500 34.350

TOPOGRAPHICAL SYMBOLS
OVERHEAD ELECTRICAL — ELEC
OVERHEAD TELEPHONE — TELE
FENCE LINE
VEGETATION OUTLINE
SINGLE GATE
DOUBLE GATE
TREE
CONTOURS — 92.000m
SLOPING DIRECTION LINE

REV	DATE	AMENDMENTS
A	06.04.2022	ADDITIONAL AREA ADDED FOLLOWING SITE VISIT

MOBILE CAD
Surveying Solutions

PROJECT: TOPOGRAPHICAL SURVEY
ADDRESS: SUNDIAL HOUSE, ORCHARD LANE, MOLESEY, EAST MOLESEY, KT8 0BN.
DWG NO.: 3340 - 02
DWG TITLE: SOUTH SITE - SITE PLAN
DWG DATE: JANUARY 2022
DWG SIZE: SCALE AS SHOWN @ A1
DRAWN: MW CHECKED: JW ISSUE A

NORTH SITE - SITE PLAN

1:500 Scale

Note:
Areas drawn indicatively noted and indicated by grey dashed line as line below

LEVEL DATUM & ORIENTATION

N

LEVELS & DRAWING ORIENTATION CO-ORDIATED TO WORLD CO-ORDINATES USING GPS EQUIPMENT (SPECTRA SP60). PERMANENT STATIONS LOCATED IN POSITIONS INDICATED ON PLAN AS FOLLOWS:-

STN 01-	E-514613.097,	N-167367.800,	HT - 9.309m
STN 02-	E-514613.333,	N-167364.116,	HT - 9.320m
STN 03-	E-514613.590,	N-167360.415,	HT - 9.310m
STN 04-	E-514605.106,	N-167365.862,	HT - 9.198m
STN 05-	E-514632.200,	N-167296.194,	HT - 9.753m
STN 06-	E-514633.288,	N-167286.289,	HT - 9.734m
STN 07-	E-514640.539,	N-167295.300,	HT - 9.811m
STN 08-	E-514637.636,	N-167300.119,	HT - 9.692m
STN 09-	E-514455.230,	N-167405.090,	HT - 9.439m
STN 10-	E-514456.122,	N-167408.178,	HT - 9.431m
STN 11-	E-514449.236,	N-167410.310,	HT - 9.414m
STN 12-	E-514448.346,	N-167406.898,	HT - 9.421

ABBREVIATIONS & LEGEND:

LEVELS & HEIGHTS

CL	-	COVER LEVEL
IL	-	INVERT LEVEL
L	-	LEVEL
HT	-	HEIGHT
STN	-	SURVEY STATION
BM	-	BEAM
CE	-	CEILING
J	-	JOISTS
RA	-	RAFTERS
E	-	EAVES
F	-	FENCE
U/S	-	UNDERSIDE OF
RL	-	RIDGE LINE
FR	-	FLAT ROOF
HL	-	HIP LINE
VL	-	VALLEY LINE
PW	-	PARAPET WALL
SL	-	SLAB
SF	-	SOFFIT
T	-	TREE
THR	-	THRESHOLD
To	-	TOP OF
W	-	WALL
HH	-	HEAD HEIGHT
OH	-	OPENING HEIGHT
SH	-	SILL HEIGHT

GENERAL NOTES

AB	-	ADVERTISING BOARD
AC	-	AIR CONDITIONING UNIT
AHU	-	AIR HANDLING UNIT
AP	-	INTRUDER ALARM PANEL
B	-	BOLLARD
BA	-	BARRIER
BE	-	BENCH
BS	-	BUS STOP
BLR	-	BOILER
BXO	-	BOXING OUT
CAH	-	CEILING ACCESS HATCH
CHY	-	CHIMNEY
CPD	-	CUPBOARD
DB	-	DOG WASTE BIN
DW	-	DWARF WALL
DK	-	DROP KERB
EDB	-	ELECTRICAL DISTRIBUTION BOARD
EG	-	EXTRACT GRILLE
EM	-	ELECTIC METER
FB	-	FUSE BOX
FP	-	FIREPLACE
FU	-	FLUE
FAP	-	FIRE ALARM PANEL
GR	-	GRASS
GU	-	GUARDING
GM	-	GAS METER
HWC	-	HOT WATER CYLINDER
LB	-	LITTER BIN
LP	-	LAMP POST
PC	-	PELICAN CROSSING
PS	-	PAVING SLABS
PL	-	PAVEMENT LIGHT
PLT	-	PLANTING
PB	-	POST BOX
RG	-	RAILING
RS	-	ROAD SIGN
RFL	-	ROOF LIGHT
SB	-	SPEED BUMP
SG	-	SIGNAGE
SN	-	STREET NAME SIGN
SWR	-	SHOWER
SHV	-	SHELVING
TB	-	TELEPHONE BOX
TL	-	TRAFFIC LIGHT
TM	-	TICKET MACHINE
TP	-	TELEGRAPH POLE
VE	-	VEGETATION
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CATV	-	CABLE TELEVISION
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FH	-	FIRE HYDRANT
GAS	-	GAS SUPPLY
PO	-	POST OFFICE TELEPHONE
SV	-	STOP VALVE
TSSU	-	TRAFFIC LIGHT SIGNALS

DRAINAGE

DC	-	DRAINAGE CHANNEL
G	-	GULLY
IC	-	INSPECTION CHAMBER
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SPOT LEVEL × 96.256

SPOT HEIGHT × toW 99.034

SURVEY STATION STN 01 E 232193.251 N 515743.694 HT: 95.142

MANHOLE / INSPECTION CHAMBER IC × CL=96.256 IL=94.824

SURVEY HEIGHT H=2.704

WINDOW TAG WINDOW 005 WH=1.962 OH=0.747 SH=1.215

DOOR TAG DOOR 005 OH=1.820

RADIATOR TAG RADIATOR 005 WH=0.598 RH=0.598 BH=0.200

TOP & BOTTOM OF KERB × 34.500 34.550

TOPOGRAPHICAL SYMBOLS

OVERHEAD ELECTRICAL

OVERHEAD TELEPHONE

FENCE LINE

VEGETATION OUTLINE

SINGLE GATE

DOUBLE GATE

TREE

CONTOURS 92.000m

SLOPING DIRECTION LINE

REV	DATE	AMENDMENTS
A	06.04.2022	SURVEY AREA ADDED FOLLOWING SITE VISIT

MOBILE CAD Surveying Solutions

PROJECT: TOPOGRAPHICAL SURVEY

ADDRESS: SUNDIAL HOUSE, ORCHARD LANE, MOLESEY, EAST MOLESEY, KT8 0BN.

DWG NO.: 3340 - 03

DWG TITLE: NORTH SITE - SITE PLAN

DWG DATE: JANUARY 2022

DWG SIZE: SCALE AS SHOWN @ A1

DRAWN: MW | CHECKED: JW | ISSUE: A

APPENDIX 3 – Environment Agency Correspondence

creating a better place

Environment Agency

Elmbridge Borough Council
Development Control
Civic Centre High Street
Esher
Surrey
KT10 9SD

Our ref: WA/2023/130267/02-L01
Your ref: 2022/3525

Date: 25 September 2023

Dear Sir/Madam

Development Comprising 3 Detached Buildings Containing 74 Residential Units With Underground And Surface Level Car And Cycle Parking, Mechanical Plant, Soft And Hard Landscaping And Associated Diversion Of Thames Water Pipe Following Demolition Of Existing Buildings.

The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

Thank you for re-consulting us on the above application on 08 June 2023, following the submission of additional information and thank you for agreeing an additional timeframe for the provision of our comments.

We have reviewed the following documents with regards to our planning remit:

- Proposed basement layouts, proposed ground floor plans, proposed elevations, proposed sections dated 07/06/2023
- Response to Environment Agency (ref: HRS.0572.001.R.005.A) dated 05 June 2023, prepared by KRS Environmental
- Updated Flood Risk Assessment (ref: KRS.0597.001.R.003.E) dated June 2023, prepared by KRS Environmental
- Design and Access Statement Addendum (ref: A3711 2-10 D&A-A-R4) dated June 2023, prepared by Assael
- Existing Site Plan - Ground Floor dated 29/11/2022
- BNG Metric Assessment (ref: RT-MME-159247-02) dated May 2023, prepared by Middlemarch Environmental Ltd.
- Executive summary - Biodiversity prepared by Middlemarch Environmental Ltd.
- Landscape and Ecological Management Plan (ref: RT-MME-160495-02) dated May 2023, prepared by Middlemarch Environmental Ltd.
- Construction Ecological Management Plan (ref: RT-MME-160495-01) dated April 2023, prepared by Middlemarch Environmental Ltd.
- Bat Mitigation strategy (ref: RT-MME-159247-01) dated May 2023, prepared by Middlemarch Environmental Ltd.

Invasive Species Method Statement (ref: RT-MME-153851-04 Rev: B) dated May 2023, prepared by Middlemarch Environmental Ltd.

Environment Agency position
The additional information does not address our earlier flood risk concerns. In accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the National Planning Policy Framework (NPPF), in the absence of an acceptable Flood Risk Assessment (FRA), we therefore **maintain our objection 1 – Flood Risk** set out in our response dated 29 March 2022 (letter reference: WA/2023/130267/01-L01). We recommend that planning permission should be refused on this basis.

The additional information has addressed our earlier biodiversity concerns therefore subject to our flood risk objection being overcome, we have conditions we would recommend in regards to biodiversity.

Reasons
The site lies within Flood Zones 2 and 3, which is land defined by the Planning Practice Guidance as having a high probability of flooding. Notwithstanding the mitigation measures proposed, the risk to life and property, both within the development and in upstream and downstream locations from fluvial inundation would be unacceptable if the development were to be permitted.

The application does not demonstrate that occupants can remain safe for the lifetime of the development when allowances for climate change are taken into consideration. The applicant has used the correct climate change allowances to assess an extreme flood event. However, they have failed to show the extents of this flood event and how it will affect the site.

The proposed development will impede flood flow and reduce storage capacity thereby increasing the risk of flooding. In the FRA, Table 7 shows the buildings footprint increases by 1091m2. The table also shows that the hardscaping footprint decreases by 530m2. Overall, this still results in a loss of floodplain storage and therefore flood compensation is needed. We can see that a permeable paving has been added to the design to help prevent flooding, this is an acceptable SUDS strategy but cannot be accepted as a form of floodplain compensation. This is because permeable paving is not a direct form of flood mitigation.

In addition, it has come to our attention that the Product 4 data referred to in the submitted FRA is not entirely accurate in reference to this site. Part of the node data contained within the Product 4 data previously used for this site (under ref: 'KSL 230767 AC') is incorrect, and therefore updated Product 4 data will be required to ensure the FRA for this development uses the best available (corrected) data. We will supply this for you by responding to your original request with the updated data.

Subsequently, our previous request for the applicant to supply evidence and justification for their calculation of the 1% annual exceedance probability (AEP) plus 12% climate change flood event which had been derived from the node data for the 1% AEP plus 20% flood event will need to be readdressed once the corrected/updated Product 4 data has been supplied.

Furthermore, the applicant's comments in section 3.8 of the updated FRA suggesting that the site would be flood free during the 0.1% AEP flood event are based on the superseded Product 4 data previously supplied for this site, and therefore do not give an

accurate depiction of the flood risk for the 1% AEP plus climate change or the 0.1% AEP scenarios.

This objection is in accordance with paragraph 164 of the NPPF which states the development must be safe for its lifetime without increasing flood risk elsewhere and paragraph 167 of the NPPF which states development must be appropriately flood resistant and resilient.

Overcoming our objection
To overcome our objection, the applicant should use the updated Product 4 data that will be supplied to submit a revised FRA which addresses the points highlighted above. If this cannot be achieved, we are likely to maintain our objection. Please re-consult us on any revised FRA submitted.

Further information – Floodplain storage
Any increase in built footprint or raising of ground levels should be compensated up to the 1% AEP plus an appropriate allowance for climate change flood level. Level for level floodplain compensation is the preferred method of mitigation and should be considered within the FRA.

Level for level floodplain compensation is the matching of floodplain storage volumes lost with new floodplain storage volume gained through the reduction of ground levels. We recommend that level for level floodplain storage calculations are provided in a table that sets out the change in volumes across the site using 100mm or 200mm slices (dependent on site specific considerations), stating the losses and gains for each slice. The location of the changes in floodplain storage should also be clearly identified in a plan or drawing that demonstrates the scheme would be hydraulically connected for each slice.

Excavation of the proposed flood plain compensation scheme should be completed prior to the construction of development to ensure flood plain capacity is maintained.

If this cannot be achieved, then the applicant may need to amend the development to ensure that there will be no increase in flood risk elsewhere (for example by reducing built footprint or amount of land raising proposed).

Riparian ownership – advice to applicant
As a section of main river runs along the western boundary of your site, you may have riparian ownership of that section of the watercourse. Please visit our website for guidance on riparian ownership and owning watercourses here: Owning a watercourse - GOV.UK (www.gov.uk).

Sequential test – advice to Planning Authority
What is the sequential test and does it apply to this application?
In accordance with the National Planning Policy Framework (paragraph 162), development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.
Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.
The only developments exempt from the sequential test in flood risk areas are:

- Householder developments such as residential extensions, conservatories or loft conversions

Small non-residential extensions with a footprint of less than 250sqm
Changes of use (except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site)
Applications for development on sites allocated in the development plan through the sequential test, which are consistent with the use for which the site was allocated.

Avoiding flood risk through the sequential test is the most effective way of addressing flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

Who undertakes the sequential test?
It is for you, as the local planning authority, to decide whether the sequential test has been satisfied, but the applicant should demonstrate to you, with evidence, what area of search has been used. Further guidance on the area of search can be found in the planning practice guidance here.

What is our role in the sequential test?
We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance here.

Exception test – advice to Planning Authority
In accordance with the National Planning Policy Framework (paragraphs 164 and 165), the proposed development is appropriate provided that the site meets the requirements of the exception test. Our comments on the proposals relate to the part of the exception test that demonstrates the development is safe. The local planning authority must decide whether or not the proposal provides wider sustainability benefits to the community that outweigh flood risk.

The exception test should only be applied as set out in flood risk table 3 of the Planning Practice Guidance (PPG) following application of the sequential test. The exception test should not be used to justify the grant of planning permission in flood risk areas when the sequential test has shown that there are reasonably available, lower risk sites, appropriate for the proposed development.

In those circumstances, planning permission should be refused, unless you consider that sustainable development objectives make steering development to these lower risk sites inappropriate as outlined in PPG (ref ID: 7-033-20140306).

Our role in the exception test
The exception test is in two parts, described in the NPPF (paragraph 164). In order for the test to be passed it must be demonstrated that
1. The development would provide wider sustainability benefits to the community that outweigh flood risk; and

2. The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Cont/d..

Paragraph 165 of the NPPF makes clear that both parts need to be met for the test to be satisfied. It is for the applicant to demonstrate this.
We provide advice on the second part of the test, but it is for you, as the local planning authority, to consider the first part of the test, accounting for the findings of the flood risk assessment and our flood risk advice, and to determine whether the test, overall, has been satisfied. Development that does not satisfy both parts of the exception test should be refused.

Where the flood risk assessment shows the development will be safe throughout its lifetime without increasing flood risk elsewhere
Even where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, there will always be some remaining risk that the development will be affected either directly or indirectly by flooding. You will need to weigh these risks against any wider sustainability benefits to the community.

Environmental permit - advice to applicant
Please be aware that a Flood Risk Activity Permit (FRAP) is likely to be required for any works within 8m of a main river. This includes the proposed diversion of the Thames Water main as outlined in drawing ref: 'A3711-ASA-ZZ-00-DR-A-0210', dated 02/06/2023. To apply for a FRAP we recommend you contact one of our Flood and Coastal Risk Management Officers at the following email address: PSO.SWLondonandMole@environment-agency.gov.uk.

The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission

Under the Environmental Permitting (England and Wales) Regulations 2016, the Environment Agency has the power to enforce against unpermitted works or works not carried out according to a FRAP. The Environment Agency also have the power under section 107(3) of the Water Resources Act to serve a notice on a landowner/person who controls the watercourse to remove an obstruction to a river where the flow is impeded.

The Environment Agency can use enforcement powers if necessary to ensure the riparian owners carry out the necessary works to ensure that the flow of water in a main river is not impeded and therefore reduce the flood risk.

The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Flood resistance and resilience - advice to LPA/applicant

Cont/d..

We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. If you'd like to find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the planning practice guidance. Further guidance on flood resistance and resilience measures can also be found in:

Government guidance on flood resilient construction
https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings
CIRIA Code of Practice for property flood resilience
https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience_.aspx
British Standard 85500 – Flood resistant and resilient construction
https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686

Risks from floating vehicles during flood event - advice to LPA/applicant
This development has been proposed within an area identified as being at risk of flooding, and includes the provision of car parking within buildings. The applicant should be aware that vehicles can start to float in flood depths of less than 60cm – less if it is fast-flowing. The applicant must satisfy themselves that any relevant building will be constructed in such a way that vehicles floating or displaced as a result of flooding, would not jeopardise its structural stability.

In addition, the applicant should ensure that any sensitive infrastructure such as gas and water pipes or electrical cabling are located and designed to withstand the potential impacts of floating or displaced vehicles.

Other Consents – advice to applicant
As you are aware we also have a regulatory role in issuing legally required consents, permits or licences for various activities. We have not assessed whether consent will be required under our regulatory role and therefore this letter does not indicate that permission will be given by the Environment Agency as a regulatory body.

The applicant should contact 03708 506 506 or consult our website to establish if consent will be required for the works they are proposing. Please see http://www.environment-agency.gov.uk/business/topics/permitting/default.aspx

Final Comments
Thank you again for consulting us on this application. Our comments are based on the best available data and the information as presented to us.

If you are minded to approve this application for major development contrary to our flood risk objection, we request that you contact us to allow further discussion and/or representations from us in line with the Town and Country Planning (Consultation) (England) Direction 2021.

This statutory instrument prevents you from issuing planning permission without first referring the application to the Secretary of State for Housing, Communities and Local Government (via the National Planning Casework Unit) to give them the opportunity to call-in the application for their own determination. This process must be followed unless we are able to withdraw our objection to you in writing.

Cont/d..

A failure to follow this statutory process could render any decision unlawful, and the resultant permission vulnerable to legal challenge.

Should you require any additional information, or wish to discuss these matters further, please do not hesitate to contact me. Please quote our reference number in any future correspondence.

Yours faithfully

Miss Chloe Alma-Daykin
Planning Advisor

Direct dial [redacted]
E-mail Planning_THM@environment-agency.gov.uk

End

creating a better place

Environment Agency

Elmbridge Borough Council
Development Control
Civic Centre High Street
Esher
Surrey
KT10 9SD

Our ref: WA/2023/130267/03-L01
Your ref: 2022/3525

Date: 28 September 2023

Dear Sir/Madam

***Amended Plans* Development Comprising 3 Detached Buildings Containing 74 Residential Units With Underground And Surface Level Car And Cycle Parking, Mechanical Plant, Soft And Hard Landscaping And Associated Diversion Of Thames Water Pipe Following Demolition Of Existing Buildings.**

The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

Thank you for re-consulting us on the above application on 26 September 2023, following the submission of an addendum to the Flood Risk Assessment dated 26 September 2023 prepared by KRS Environmental (reference: KRS.0572.001.R.006.A).

Environment Agency position
The additional information does not address our earlier flood risk concerns. In accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the National Planning Policy Framework (NPPF), in the absence of an acceptable Flood Risk Assessment (FRA), we therefore **maintain our flood risk objection** set out in our response dated 25 September 2023 (letter reference: WA/2023/130267/02-L01). We recommend that planning permission should be refused on this basis.

Reasons
Flood Risk Assessment
Having reviewed the submitted 'Flood Risk Assessment Addendum' by KRS Environmental, dated 26th September 2023, we agree with the applicant's comments regarding the erroneous Product 4 data that was previously used in the applicant's previous Flood Risk Assessments. However, in our previous response to this application (dated 25th September 2023), we stated that to overcome our objection, an updated FRA would be required which uses the updated Product 4 data which we have supplied to the applicant. As yet, it appears that no such updated FRA has been submitted. Therefore, our objection remains.

As stated in our previous response, part of the node data contained within the Product 4 data previously used for this site (under ref: 'KSL 230767 AC') is incorrect, and therefore the updated Product 4 data supplied to the applicant is required to ensure that an updated FRA for this development uses the corrected data.

Subsequently, our previous request for the applicant to supply evidence and justification for their calculation of the 1% annual exceedance probability (AEP) plus 12% climate change flood event which had been derived from the node data for the 1% AEP plus 20% flood event will need to be readdressed once the corrected/updated Product 4 data has been supplied.

Furthermore, the applicant's comments in section 3.8 of the updated FRA suggesting that the site would be flood free during the 0.1% AEP flood event are based on the superseded Product 4 data previously supplied for this site, and therefore do not give an accurate depiction of the flood risk for the 1% AEP plus climate change or the 0.1% AEP scenarios.

Compensation

The document 'Flood Risk Assessment Addendum' states: "The site is not located within the 1 in 100-year flood outline, therefore as per the Elmbridge Borough Council Flood Risk Supplementary Planning Document (SPD) floodplain compensation is not required (see para 3.4.20 of the SPD)." However, the Elmbridge Borough Council Flood Risk Supplementary Planning Document (SPD) states: "Floodplain compensation must be considered in the context of the 1% annual probability (1 in 100 year/Flood Zone 3) flood level including an allowance for climate change." This means that flood compensation must take the 1 in 100 year **plus climate change scenario** into account. The lower Thames modelling shows us that the site is affected by the climate change scenario and therefore flood compensation should be provided.

Overcoming our objection

As mentioned above, to overcome our objection, the applicant should use the updated Product 4 data which we have supplied to submit a revised FRA which addresses the points highlighted above. If this cannot be achieved, we are likely to maintain our objection.

Further information – Floodplain storage compensation

Any increase in built footprint or raising of ground levels should be compensated up to the 1% AEP plus an appropriate allowance for climate change flood level. Level for level floodplain compensation is the preferred method of mitigation and should be considered within the FRA.

Level for level floodplain compensation is the matching of floodplain storage volumes lost with new floodplain storage volume gained through the reduction of ground levels. We recommend that level for level floodplain storage calculations are provided in a table that sets out the change in volumes across the site using 100mm or 200mm slices (dependent on site specific considerations), stating the losses and gains for each slice. The location of the changes in floodplain storage should also be clearly identified in a plan or drawing that demonstrates the scheme would be hydraulically connected for each slice.

Excavation of the proposed flood plain compensation scheme should be completed prior to the construction of development to ensure flood plain capacity is maintained.

Cont/d..

If this cannot be achieved, then the applicant may need to amend the development to ensure that there will be no increase in flood risk elsewhere (for example by reducing built footprint or amount of land raising proposed).

Riparian ownership – Advice to applicant:
As a section of main river runs along the western boundary of your site, you may have riparian ownership of that section of the watercourse. Please visit our website for guidance on riparian ownership and owning watercourses here: Owning a watercourse - GOV.UK (www.gov.uk)

Environmental permit – Advice to applicant
Please be aware that a Flood Risk Activity Permit (FRAP) is likely to be required for any works within 8m of a main river. This includes the proposed diversion of the Thames Water main as outlined in drawing ref: 'A3711-ASA-ZZ-00-DR-A-0210', dated 02/06/2023. To apply for a FRAP we recommend you contact one of our Flood and Coastal Risk Management Officers at the following email address: PSO.SWLondonandMole@environment-agency.gov.uk.

Under the Environmental Permitting (England and Wales) Regulations 2016, you must follow the environmental permitting rules if you want to do work:

on or within 8 metres of a main river (16 metres if tidal)
on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
in a flood plain
on or within 16 metres of a sea defence

Under the Environmental Permitting (England and Wales) Regulations 2016, the Environment Agency has the power to enforce against unpermitted works or works not carried out according to a FRAP. The Environment Agency also have the power under section 107(3) of the Water Resources Act to serve a notice on a landowner/person who controls the watercourse to remove an obstruction to a river where the flow is impeded.

The Environment Agency can use enforcement powers if necessary to ensure the riparian owners carry out the necessary works to ensure that the flow of water in a main river is not impeded and therefore reduce the flood risk.
The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Flood resistance and resilience - advice to LPA/applicant
We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. If you'd like to find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the planning practice guidance. Further guidance on flood resistance and resilience measures can also be found in:

- *Government guidance on flood resilient construction* https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings

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- CIRIA Code of Practice for property flood resilience https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience_.aspx
- *British Standard 85500 – Flood resistant and resilient construction* https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686

Risks from floating vehicles during flood event - advice to LPA/applicant
This development has been proposed within an area identified as being at risk of flooding, and includes the provision of car parking within buildings. The applicant should be aware that vehicles can start to float in flood depths of less than 60cm – less if it is fast-flowing. The applicant must satisfy themselves that any relevant building will be constructed in such a way that vehicles floating or displaced as a result of flooding, would not jeopardise its structural stability.

In addition, the applicant should ensure that any sensitive infrastructure such as gas and water pipes or electrical cabling are located and designed to withstand the potential impacts of floating or displaced vehicles.

Sequential test – advice to Planning Authority
What is the sequential test and does it apply to this application?
In accordance with the National Planning Policy Framework (paragraph 162), development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.
Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.
The only developments exempt from the sequential test in flood risk areas are:

Householder developments such as residential extensions, conservatories or loft conversions
Small non-residential extensions with a footprint of less than 250sqm
Changes of use (except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site)
Applications for development on sites allocated in the development plan through the sequential test, which are consistent with the use for which the site was allocated.

Avoiding flood risk through the sequential test is the most effective way of addressing flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

Who undertakes the sequential test?
It is for you, as the local planning authority, to decide whether the sequential test has been satisfied, but the applicant should demonstrate to you, with evidence, what area of search has been used. Further guidance on the area of search can be found in the planning practice guidance here.

What is our role in the sequential test?
We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean

Cont/d..

steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance here.

Exception test – advice to Planning Authority
In accordance with the National Planning Policy Framework (paragraphs 164 and 165), the proposed development is appropriate provided that the site meets the requirements of the exception test. Our comments on the proposals relate to the part of the exception test that demonstrates the development is safe. The local planning authority must decide whether or not the proposal provides wider sustainability benefits to the community that outweigh flood risk.

The exception test should only be applied as set out in flood risk table 3 of the Planning Practice Guidance (PPG) following application of the sequential test. The exception test should not be used to justify the grant of planning permission in flood risk areas when the sequential test has shown that there are reasonably available, lower risk sites, appropriate for the proposed development.

In those circumstances, planning permission should be refused, unless you consider that sustainable development objectives make steering development to these lower risk sites inappropriate as outlined in PPG (ref ID: 7-033-20140306).

Our role in the exception test
The exception test is in two parts, described in the NPPF (paragraph 164). In order for the test to be passed it must be demonstrated that
1. The development would provide wider sustainability benefits to the community that outweigh flood risk; and

2. The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Paragraph 165 of the NPPF makes clear that both parts need to be met for the test to be satisfied. It is for the applicant to demonstrate this.
We provide advice on the second part of the test, but it is for you, as the local planning authority, to consider the first part of the test, accounting for the findings of the flood risk assessment and our flood risk advice, and to determine whether the test, overall, has been satisfied. Development that does not satisfy both parts of the exception test should be refused.

Where the flood risk assessment shows the development will be safe throughout its lifetime without increasing flood risk elsewhere
Even where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, there will always be some remaining risk that the development will be affected either directly or indirectly by flooding. You will need to weigh these risks against any wider sustainability benefits to the community.

Other Consents – advice to applicant
As you are aware we also have a regulatory role in issuing legally required consents, permits or licences for various activities. We have not assessed whether consent will be required under our regulatory role and therefore this letter does not indicate that permission will be given by the Environment Agency as a regulatory body.

The applicant should contact 03708 506 506 or consult our website to establish if consent will be required for the works they are proposing. Please see http://www.environment-agency.gov.uk/business/topics/permitting/default.aspx.

Final Comments
Thank you again for consulting us on this application. Our comments are based on the best available data and the information as presented to us. Subject to our flood risk objection being overcome, we have planning conditions we would recommend in regard to biodiversity.

If you are minded to approve this application for major development contrary to our flood risk objection, we request that you contact us to allow further discussion and/or representations from us in line with the Town and Country Planning (Consultation) (England) Direction 2021.

This statutory instrument prevents you from issuing planning permission without first referring the application to the Secretary of State for Housing, Communities and Local Government (via the National Planning Casework Unit) to give them the opportunity to call-in the application for their own determination. This process must be followed unless we are able to withdraw our objection to you in writing. A failure to follow this statutory process could render any decision unlawful, and the resultant permission vulnerable to legal challenge.

Should you require any additional information, or wish to discuss these matters further, please do not hesitate to contact me. Please quote our reference number in any future correspondence.

Yours faithfully

Miss Chloe Alma-Daykin
Planning Advisor

Direct dia [redacted]
E-mail Planning_THM@environment-agency.gov.uk

End

creating a better place

Environment Agency

Elmbridge Borough Council
Development Control
Civic Centre High Street
Esher
Surrey
KT10 9SD

Our ref: WA/2023/130267/01-L01
Your ref: 2022/3525

Date: 29 March 2023

Dear Sir/Madam

Development Comprising 3 Detached Buildings Containing 74 Residential Units With Underground And Surface Level Car And Cycle Parking, Mechanical Plant, Soft And Hard Landscaping And Associated Diversion Of Thames Water Pipe Following Demolition Of Existing Buildings.

The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

Thank you for consulting us on the proposed development noted above and thank you for agreeing an additional timeframe for the provision of our comments. We have reviewed the submitted documents with regards to our planning remit.

The proposed development is within 8 metres of a main river, the River Ember. According to our Flood Map for Planning, the application site partially lies within Flood Zones 2 and 3, which is land defined by the Planning Practice Guidance (PPG) as having a medium and high probability of flooding respectively.

Environment Agency position
We have **two objections** to the application as submitted.

Objection 1 – Flood Risk
In accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the National Planning Policy Framework (NPPF), in the absence of an acceptable Flood Risk Assessment (FRA), we **object** to this application and recommend that planning permission is refused.

Reason(s) 1
The submitted FRA does not comply with the requirements for site-specific flood risk assessments, as set out in paragraphs 20 to 22 of the Flood Risk and Coastal Change section of the Planning Practice Guidance. Therefore, the FRA does not adequately assess the flood risks posed by the development. In particular, the FRA fails to:

Provide evidence (for example, using a topographic survey) to confirm the ground levels referred to in sections 2.4, 3.8, 3.14, and 6.2;

Provide evidence (for example, using exact measurements to compare differences in built footprint from the existing development to the proposed development, particularly for the southwest section of the development which is situated within FZ3a) to support the statements made in sections 4.1 and 6.3 regarding the requirement for floodplain compensatory storage;

Provide sufficient evidence (for example, displaying full calculations, with a full justification for the method(s) used, including any assumptions made in respect of the relationship between flood levels and 1% increases in climate change river flows) to support the figures referred to in section 3.8 regarding the calculation of the design flood event levels (1% annual exceedance probability (AEP) plus 12% climate change flood event), which have been derived from the Environment Agency Product 4 data for the 1% AEP (plus 20% climate change) event to inform the Finished Floor Levels (FFLs) referred to;

Justify the consultants' interpretations of the Environment Agency Product 4 data regarding the statements made in section 3.3 on historic flooding, and in sections 3.8 and 3.14 on modelled site inundation, as these appear to contradict the figures which are referred to as evidence.

This objection is in accordance with Policy CS26 of the Elmbridge Core Strategy (July 2011) and paragraph 167 of the NPPF which states 'Development must be located, designed and laid out to ensure that it is safe; the risk from flooding is minimised whilst not increasing the risk of flooding elsewhere; and that residual risks are safely managed'. Furthermore, if 'development takes place in flood zones 2 or 3, the Council will require flood resistance and resilience measures in line with current Environment Agency advice'.

Overcoming our objection 1

To overcome our objection, the applicant should submit a revised FRA which addresses the points highlighted above. If this cannot be achieved, we are likely to maintain our objection. Please re-consult us on any revised FRA submitted.

Objection 2 – Biodiversity

The submitted planning application and associated documents indicate that a significant loss of riparian semi-natural habitat within the riparian zone of the River Ember will be required as part of the proposed development. This activity will require a flood risk activity permit under the Environmental Permitting (England and Wales) Regulations 2016 which is unlikely to be granted for the current proposal. In accordance with Policy CS15: Biodiversity of the Elmbridge Core Strategy (July 2011), we therefore **object** to the proposed development, due to its impacts on nature conservation, ecology and physical habitats. We recommend that planning permission is refused.

Reasons(s)

In determining the flood risk activity permit for this development, we will assess its compliance with the Thames River Basin Management Plan (RBMP). We'll also consider how the development will affect water biodiversity and the wetland environment. The RBMP states that the water environment should be protected and enhanced to prevent deterioration and promote the recovery of water bodies. The watercourse is classified as 'Heavily Modified and Supports Good'. Physical modification of the watercourse is sited as a reason for not achieving Good.

This approach is supported by paragraphs 174 and 180 of the National Planning Policy Framework (NPPF) which recognise that the planning system should conserve and enhance the environment by minimising impacts on and providing net gains for biodiversity. If significant harm resulting from a development cannot be avoided,

adequately mitigated, or as a last resort compensated for, planning permission should be refused.

In addition, this is supported by Policy CS15: Biodiversity of the Elmbridge Core Strategy (July 2011), which states the Council will seek to identify and develop wildlife corridors to provide ecological 'stepping stones' and form a coherent local and regional biodiversity network in accordance with CS12: The River Thames and its tributaries and CS14: Green Infrastructure. Also, ensuring new development does not result in a net loss of biodiversity and where feasible contributes to a net gain through the incorporation of biodiversity features.

Furthermore, the Emerging Elmbridge Borough Council Local Plan (2037), which has an ambition to protect and enhance blue and green infrastructure, Policy ENV6 states 'Development proposals must seek to protect, enhance and conserve wildlife habitats and species by creating new natural areas or restoring and enhancing existing habitats'. In addition, Policy ENV1 states 'Development proposals must be designed with green and/or blue infrastructure as an integral component, whether this be by enhancing existing features or providing new assets. Planning applications will be refused where this is not clearly demonstrated'. Also, Policy SS1 states all development must respond to the climate emergency by 'Increasing the extent, connectivity and diversity of wildlife habitats to enable animals and plants to adjust.'

This objection is also supported by legislation set out in the Natural Environment and Rural Communities Act 2006 and Article 10 of the Habitats Directive which stresses the importance of natural networks of linked corridors to allow movement of species between suitable habitats, and promote the expansion of biodiversity.

Development that encroaches on watercourses can have a potentially severe impact on their ecological value. Networks of undeveloped buffer zones might also help wildlife adapt to climate change and will help restore watercourses to a more natural state as required by the RBMP.

Overcoming our objection 2

To overcome our objection, the applicant should:

- Provide plans for the provision and management of a 10-metre-wide buffer zone, where existing site constraints allow, measured from the bank top (defined as the point at which the bank meets the level of the surrounding land) alongside the River Ember.
- The buffer zone should be free from all built development, including paths, lighting, domestic gardens and formal landscaping.
- There shall be no light spill from external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this the specifications, location and direction of external artificial lights should be such that the lighting levels within 8 metres of the top of bank of the watercourse are maintained at background levels. The Environment Agency considers background levels to be a Lux level of 0-2. To reduce light spill onto the river corridor outside the buffer zone, all artificial lighting should be directional and focused with cowlings.
- The buffer zone should be planted with locally native species of UK genetic provenance and appropriately managed under an agreed scheme.
- Provide details demonstrating how the buffer zone will be protected during development (Construction Environmental Management Plan).
- Provide a detailed Landscape Environmental Management Plan – to show how the ecological buffer zone and river corridor will be managed over the longer term

Cont/d..

(including named body responsible for management) and maintained to protect the ecology of the water-dependent habitat.

Biodiversity – Advice to applicant

Species

We have reviewed and support the recommendations as set out in the PEA, Preliminary Bat Roost Assessment, Dusk Emergence & Re-entry Bat Surveys, Herpetofauna Reasonable Avoidance Method Statement, Invasive Species Method Statement, Arboricultural method statement regarding protected habitats and species and mitigation during development.

The addition of bird and bat boxes, biodiverse green roofing, introduced native shrub habitat, native wildflower rich lawn areas and bioswale habitat is welcomed.

We understand that building B2 which is scheduled for partial demolition is a bat roost site. Prior to any works a licence must be obtained from Natural England and the works overseen by a licensed ecologist. The emphasis on sensitive lighting design as highlighted in the Lighting Impact Assessment should be subject to a planning condition.

Biodiversity Net Gain (BNG)

The development boundary includes approximately 100 metres of reinforced main river bank, the red line boundary in this case should reflect ownership up to the centreline of the river rather than to bank top. This could affect the BNG metric for rivers and streams calculation.

We welcome the use of the Biodiversity Metric for Biodiversity Net Gain calculation. However, the baseline metric calculation shows that the trading rules have not been satisfied, there is no enhancement planned in the River Units. The three types of Biodiversity Units generated by the metric (habitat, hedgerow and river) are unique and cannot be summed or transferred, therefore, a 10% uplift should be delivered in each of the biodiversity units present within the red line boundary.

River habitat

As a consequence of engineering and modification, almost half of our rivers show signs of historic or active bank reinforcement, re-sectioning or straightening. A lack of natural processes in constrained waters can often lead to poor habitat quality. Removing redundant structures and modifications is one of the 4 priority objectives for the new River Basin Management Plans. Additional effort to protect and improve the water environment, as part of new developments is required, set within the context of the government's 25 Year Environment Plan.

Removal of hard banks and reprofiling/restoration of natural banks would offer a significant environmental gain. We recommend that the proposed development is used as an opportunity to restore more natural processes or improve habitat using other methods in and adjacent to the watercourse.

Sequential test – advice to Planning Authority

What is the sequential test and does it apply to this application?

In accordance with the National Planning Policy Framework (paragraph 162), development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.

Cont/d..

Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.

Avoiding flood risk through the sequential test is the most effective way of addressing flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

Who undertakes the sequential test?
It is for you, as the local planning authority, to decide whether the sequential test has been satisfied, but the applicant should demonstrate to you, with evidence, what area of search has been used. Further guidance on the area of search can be found in the planning practice guidance here.

What is our role in the sequential test?
We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance here.

Exception test – advice to Planning Authority
In accordance with the National Planning Policy Framework (paragraphs 164 and 165), the proposed development is appropriate provided that the site meets the requirements of the exception test. Our comments on the proposals relate to the part of the exception test that demonstrates the development is safe. The local planning authority must decide whether or not the proposal provides wider sustainability benefits to the community that outweigh flood risk.

The exception test should only be applied as set out in flood risk table 3 of the Planning Practice Guidance (PPG) following application of the sequential test. The exception test should not be used to justify the grant of planning permission in flood risk areas when the sequential test has shown that there are reasonably available, lower risk sites, appropriate for the proposed development.

In those circumstances, planning permission should be refused, unless you consider that sustainable development objectives make steering development to these lower risk sites inappropriate as outlined in PPG (ref ID: 7-033-20140306).

Our role in the exception test
The exception test is in two parts, described in the NPPF (paragraph 164). In order for the test to be passed it must be demonstrated that
1. The development would provide wider sustainability benefits to the community that outweigh flood risk; and

2. The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Paragraph 165 of the NPPF makes clear that both parts need to be met for the test to be satisfied. It is for the applicant to demonstrate this.

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We provide advice on the second part of the test, but it is for you, as the local planning authority, to consider the first part of the test, accounting for the findings of the flood risk assessment and our flood risk advice, and to determine whether the test, overall, has been satisfied. Development that does not satisfy both parts of the exception test should be refused.

Where the flood risk assessment shows the development will be safe throughout its lifetime without increasing flood risk elsewhere
Even where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, there will always be some remaining risk that the development will be affected either directly or indirectly by flooding. You will need to weigh these risks against any wider sustainability benefits to the community.

Flood resistance and resilience – advice to applicant and Planning Authority
We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. If you'd like to find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the planning practice guidance. Further guidance on flood resistance and resilience measures can also be found in:

Government guidance on flood resilient construction
https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings

CIRIA Code of Practice for property flood resilience
https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience_.aspx
British Standard 85500 – Flood resistant and resilient construction
https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686

Risk from floating vehicles during flood event – advice to applicant and Planning Authority
This development has been proposed within an area identified as being at risk of flooding, and includes the provision of car parking within buildings. The applicant should be aware that vehicles can start to float in flood depths of less than 60cm – less if it is fast-flowing. The applicant must satisfy themselves that any relevant building will be constructed in such a way that vehicles floating or displaced as a result of flooding, would not jeopardise its structural stability.
In addition, the applicant should ensure that any sensitive infrastructure such as gas and water pipes or electrical cabling are located and designed to withstand the potential impacts of floating or displaced vehicles.

Environmental permit – advice to applicant
The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert

Cont/d..

in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission

For further guidance please visit https://www.gov.uk/guidance/flood-risk-activities-environmental-permits or contact our National Customer Contact Centre on 03708 506 506 (Monday to Friday, 8am to 6pm) or by emailing enquiries@environment-agency.gov.uk.

The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Other Consents – advice to applicant

As you are aware we also have a regulatory role in issuing legally required consents, permits or licences for various activities. We have not assessed whether consent will be required under our regulatory role and therefore this letter does not indicate that permission will be given by the Environment Agency as a regulatory body.

The applicant should contact 03708 506 506 or consult our website to establish if consent will be required for the works they are proposing. Please see http://www.environment-agency.gov.uk/business/topics/permitting/default.aspx

Final Comments

Thank you again for consulting us on this application. Our comments are based on the best available data and the information as presented to us.

If you are minded to approve this application for major development contrary to our flood risk objection, we request that you contact us to allow further discussion and/or representations from us in line with the Town and Country Planning (Consultation) (England) Direction 2021.

This statutory instrument prevents you from issuing planning permission without first referring the application to the Secretary of State for Housing, Communities and Local Government (via the National Planning Casework Unit) to give them the opportunity to call-in the application for their own determination. This process must be followed unless we are able to withdraw our objection to you in writing. A failure to follow this statutory process could render any decision unlawful, and the resultant permission vulnerable to legal challenge.

Should you require any additional information, or wish to discuss these matters further, please do not hesitate to contact me. Please quote our reference number in any future correspondence.

Yours faithfully

Miss Chloe Alma-Daykin
Planning Advisor

Direct dial [redacted]
E-mail Planning_THM@environment-agency.gov.uk

End

Keelan

From:	Planning_THM <Planning_THM@environment-agency.gov.uk>
Sent:	17 April 2023 15:54
To:	Keelan
Cc:	Jack Trendall
Subject:	RE: The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

Dear Keelan,

Thank you for your emails and apologies for the delay in getting back to you, we are experiencing a significant increase in the number of consultations and enquiries that we receive and are currently working at less than 40% of our normal staffing capacity within our team.

I'm currently having issues with my voicemail as it moves over to another system so I haven't been able to pick up your message, my apologies for this.

In response to your query below, the Elmbridge Borough Council Emerging Local Plan (Draft Elmbridge Local Plan 2037), which we acknowledge is yet to be adopted, section 8.34 states:

Sites that contain or are adjacent to watercourses should consider the impact that development can have on them, negative or positive. A 10 metre minimum undeveloped buffer zone, measure from the top of the river bank, protects watercourses from the impact of development, as well as providing net gains in biodiversity. A buffer zone also produces strong and resilient ecosystems, improved water quality and human health benefits through pleasant amenity space. River side buffer zones must be free from built development including lighting, domestic gardens and formal landscaping.

Development that encroaches on watercourses can have a potentially severe impact on their ecological value. We would therefore like to see consideration within the proposed development for a scheme to protect a minimum 8 metre wide buffer zone along the River Ember. Please note that any encroachment within a 10 metre riparian zone is penalised within the BNG Rivers metric assessment, therefore to provide the most net gains we would recommend providing a 10 metre buffer zone where possible, and creating semi natural habitat along this corridor will provide the most benefit for wildlife. A 10 metre buffer zone is also supported by the Emerging Elmbridge Borough Council Local Plan.

As you've mentioned, a Flood Risk Activity Permit (FRAP) is required for works within 8 metres of a main river. Our letter dated 29 March 2023 (ref: WA/2023/130267/01-L01) is written in regards to our planning remit and the objection reasoning is based on the significant loss of riparian semi-natural habitat within the riparian zone of the River Ember. Permitting and planning are separate processes and we recommend you consult with us at the earliest opportunity regarding a permit by contacting: enquiries@environment-agency.gov.uk.

I hope this clarifies your query and to summarise, we are requesting an 8 metre buffer zone to the River Ember but recommend a 10 metre buffer zone for the reasons given above.

Kind regards,

Chloe

Chloe Alma-Daykin
Planning Advisor | Sustainable Places | Thames Area
Environment Agency | Red Kite House, Howbery Park, Benson Lane, Crowmarsh, OX10 8BD
Telephone: 020 302 59872

Please accept my thanks for your email in advance – it is estimated that each UK adult sending one less 'thank you' email per day would save more than 16,400 tonnes of carbon per year. This is equivalent of taking 3,334 diesel cars off the road.

From: Keelan [redacted]
Sent: 17 April 2023 09:46
To: Planning_THM <Planning_THM@environment-agency.gov.uk>
Subject: FW: The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

> You don't often get email from [redacted] Learn why this is important

Dear Chloe,

I have just left you a telephone message with regards to the email shown below, please can you reply to my email/telephone call as a matter of urgency.

We need to get to the bottom of the required buffer strip as guidance requires an 8m buffer strip but have stated a requirement for a 10m buffer strip.

Please can you respond today.

Regards

Keelan Serjeant BSc MSc MCIWEM
Director | Flood Risk and Drainage Consultant

T: 01686 668957 M [redacted]

www.krsenviro.com

From: Keelan
Sent: Thursday, April 13, 2023 3:17 PM
To: Planning_THM@environment-agency.gov.uk
Subject: The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN

Dear Chloe,

RE: Development Comprising 3 Detached Buildings Containing 74 Residential Units With Underground And Surface Level Car And Cycle Parking, Mechanical Plant, Soft And Hard Landscaping And Associated Diversion Of Thames Water Pipe Following Demolition Of Existing Buildings. The Molesey Venture Sundial House Orchard Lane East Molesey Surrey KT8 0BN. Your Ref: WA/2023/130267/01-L01, LPA Ref: 2022/3525

I have been passed on your letter dated 23/03/2023 for the planning application shown above.

Within your letter you mention that the site is within 8m of a Main River and then state that we must *"Provide plans for the provision and management of a 10-metre-wide buffer zone, where existing site constraints allow, measured from the bank top (defined as the point at which the bank meets the level of the surrounding land) alongside the River Ember. The buffer zone should be free from all built development, including paths, lighting, domestic gardens and formal landscaping."*

From our experience a Flood Activities Permit is only 8m (unless tidal) and not 10m as you have stated. The Governments guidance is clear that it is only 8m as shown in this link: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

The Elmbridge Council Supplementary Planning Document also is based on 8m as shown in this link: https://www.elmbridge.gov.uk/planning/local-plan/current-policies-and-guidance/supplementary-planning-documents/flood-risk/

We have supported many planning applications and permit applications where we have been asked for an 8m buffer but not a 10m buffer.

Please can you confirm that you actually only require an 8m buffer as per the guidance and policy and not 10m.

Regards

Keelan Serjeant BSc MSc MCIWEM
Director | Flood Risk and Drainage Consultant

T: 01686 668957 M [redacted]

www.krsenviro.com

Product 4 (Detailed Flood Risk) for: Sundial House, The Molesey Venture, Orchard Lane, East Molesey KT8 0BN
Requested by: Keelan Serjeant
Reference: KSL 230767 AC
Date: 09/08/2023

Contents

The information provided is based on the best data 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 to the data for this location. 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.

Please note. Due to the location of your site you may also need to obtain the Lower Thames Flood Modelling Study. This can be done by contacting enquiries_THM@environment-agency.gov.uk .

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Flood Risk Assessments: Climate Change Allowances

On 20/07/2021 the ‘Flood risk assessments: climate change allowances’ were updated and published on gov.uk. You can view the updated allowances at ‘Flood risk assessments: climate change allowances’.

You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

It remains the applicant’s responsibility to demonstrate through their proposals and flood risk assessments that a new development will be safe in flood risk terms for its lifetime.

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Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers & Sea)

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. The map also shows the location of some flood defences.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time, taking into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at www.environment-agency.gov.uk.

At this Site:

The Flood Map shows that this property/site lies within the outline of Flood Zone 3. This zone comprises land assessed as having a 1% chance of flooding from rivers in any given year.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using our detailed fluvial model; Lower Mole Modelling and Flood Risk Mapping, completed in 2009 by Halcrow

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Detailed FRA Map centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)

Legend

- Statutory Main River
- Site
- Flood Defences
- Water Storage Area
- Flood Zone 3
- Flood Zone 2

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Scale 1:2,000

0 50 100

Meters

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Model Output Data

You have requested flood levels for various return periods at this location.

2D

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Using a 2D TuFLOW model the floodplain has been represented as a grid. The flood water levels have been calculated for each grid cell.

A map showing the location of the points from which the data is taken is enclosed. Please note you should read the notice enclosed for your specific use rights.

Table 1: Modelled Defended Node Levels

			Modelled Flood Level for Annual Exceedance Probability Shown, in Metres AOD			
Node ID	**Easting**	**Northing**	**5% AEP**	**1% AEP**	**1% AEP Plus Climate Change**	**0.1% AEP**
52134	514632	167394	Nil Return	Nil Return	Nil Return	8.88
52948	514597	167379	Nil Return	Nil Return	Nil Return	8.88
52950	514622	167379	Nil Return	Nil Return	Nil Return	8.88
53210	514572	167374	Nil Return	Nil Return	Nil Return	8.89
53977	514572	167359	Nil Return	Nil Return	Nil Return	8.93
53978	514622	167359	Nil Return	Nil Return	Nil Return	8.88
54222	514637	167354	Nil Return	Nil Return	Nil Return	8.88
54702	514592	167344	Nil Return	Nil Return	Nil Return	8.95
55178	514597	167334	Nil Return	7.88	8.14	8.95
56058	514612	167314	7.29	7.88	8.14	8.96

Data taken from our Lower Mole Modelling and Flood Risk Mapping, completed in 2009 by Halcrow

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2D Node Locations Map
centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)

Legend

- Statutory Main River
- Site
- 2D Nodes

Scale 1:1,000

0 25 50

Meters

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

1D

The modelled flood levels for the most appropriate cross sections taken from our 2D modelling of the River Mole, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Table 2: Modelled Undefended Node Levels

		Modelled Flood Level for Annual Exceedance Probability Shown, in Metres AOD			
Node ID	**Easting**	**Northing**	**1% AEP**	**0.5% AEP**	**0.1% AEP**
Emb315	514635	167212	8.68	9.02	9.57
Emb296R	514628	167232	8.49	8.71	9.54
Emb271	514614	167257	8.49	8.71	9.54
Emb239	514617	167284	8.49	8.71	9.54
Emb217	514607	167308	8.49	8.71	9.55
Emb150	514561	167353	8.49	8.71	9.52
Emb94	514518	167378	8.49	8.71	9.51
Emb37	514502	167434	8.49	8.71	9.51

Data taken from our Lower Mole Modelling and Flood Risk Mapping, completed in 2009 by Halcrow

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Table 3: Modelled Defended Node Levels

			Modelled Flood Level for Annual Exceedance Probability Shown, in Metres AOD						
Node ID	**Easting**	**Northing**	**20% AEP**	**5% AEP**	**1.3 % AEP**	**1% AEP**	**1% AEP Plus Climate Change**	**0.5% AEP**	**0.1% AEP**
Emb315	514635	167212	8.08	8.25	8.62	8.70	9.08	9.04	9.59
Emb296R	514628	167232	7.57	7.81	8.44	8.51	8.96	8.72	9.54
Emb271	514614	167257	7.19	7.81	8.44	8.51	8.96	8.72	9.54
Emb239	514617	167284	7.19	7.81	8.44	8.51	8.96	8.72	9.54
Emb217	514607	167308	7.19	7.81	8.44	8.51	8.96	8.72	9.55
Emb150	514561	167353	7.19	7.81	8.44	8.51	8.96	8.72	9.52
Emb94	514518	167378	7.19	7.81	8.44	8.51	8.96	8.72	9.51
Emb37	514502	167434	7.19	7.81	8.44	8.51	8.96	8.72	9.51

Data taken from our Lower Mole Modelling and Flood Risk Mapping, completed in 2009 by Halcrow.

There are no health warnings or additional information for these levels or the model from which they were produced.

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1D Node Locations Map
centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)

Legend

- Statutory Main River
- Site
- 1D Nodes

Scale 1:2,000

0 50 100

Meters

Modelled Defended Flood Extents with Climate Change Map centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)

Legend

- Statutory Main River
- Site

Modelled Defended Flood Extents

AEP (%)

- 5% AEP
- 1% AEP
- 1% AEP +CC
- 0.1% AEP

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

Climate Change (CC) extent based on an increase of 20% in river flows.

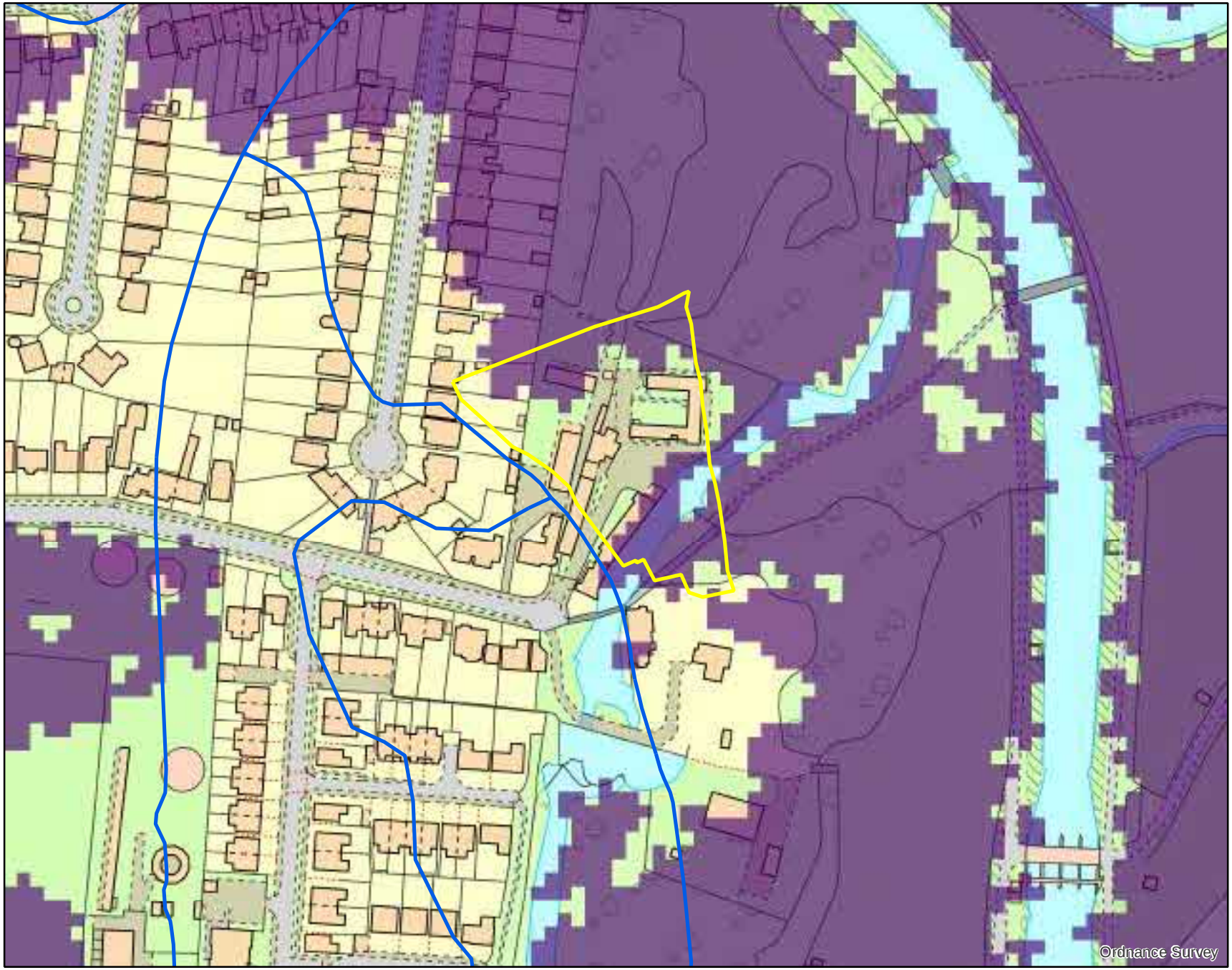
Scale 1:2,000

0 50 100

Meters

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Modelled Undefended Flood Extents Map
centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)



Legend

- Statutory Main River
- Site

Modelled Flood Extents

AEP (%)

- 1% AEP
- 0.1% AEP

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

Scale 1:2,000

0 50 100

Meters

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Defence Details

Lower Mole Flood Alleviation Scheme

Asset type – Flood Risk Management

Description – As a result of the great flood of 1968, the Lower Mole Flood Alleviation Scheme was built in the 1970's through to the mid 1980's. The Lower Mole Flood Alleviation Scheme consists of an engineered river channel, 3 water level control structures, earth embankments and flood walls. During the construction of the LMFAS major works on channel creation, widening and dredging have been done. 3km of earth bank have been constructed to keep the floods within the original floodplain upstream of Albany Bridge that is utilised during high flows to further reduce the risk to flooding downstream communities. The river is also now regulated through sluices and other structures designed to minimize flood damage. During high flows, the water level control structures are operated to convey and regulate flows through the engineered section of river channel. The scheme design flow is 241 cumecs. Of this, 31 cumecs flows via Royal Mills sluice before re-entering the flood relief channel downstream of Viaduct Sluice. The remaining 210 cumecs is diverted through Viaduct Sluice into the flood relief channel.

Location – Lower Mole

Maintainer – Environment Agency

Standard of protection – 1% (1 in 100) chance in any year

Asset protection type – Fluvial

Condition – 2

Build date – 1980's

Plans for improvement / future schemes – No formal planned improvements

Areas Benefiting from Flood Defences

The Environment Agency has taken the decision to retire this dataset and remove it from the Flood Map for Planning portal. This is because we have determined that it no longer meets the customer needs and creates a false sense of security for users.

To understand the long-term risk of flooding to an area, you can use the Check Your Long Term Flood Risk portal: this will provide an understanding of flood risk from rivers and sea, taking into account the presence and condition of defences, and other sources of flood risk such as from surface water and reservoirs.

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Website: https://www.gov.uk/government/organisations/environment-agency

Historic Flood Events Data

We hold records of historic flood events from rivers. Information on the floods that may have affected the area local to your site are provided below and in the enclosed map (if relevant).

Flood Event Data

Dates of historic flood events in this area – Dec 2013, Nov 1974, Sep 1968

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

from rivers or the sea;
surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
overflowing or backing up of sewer or drainage systems which have been overwhelmed,
groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

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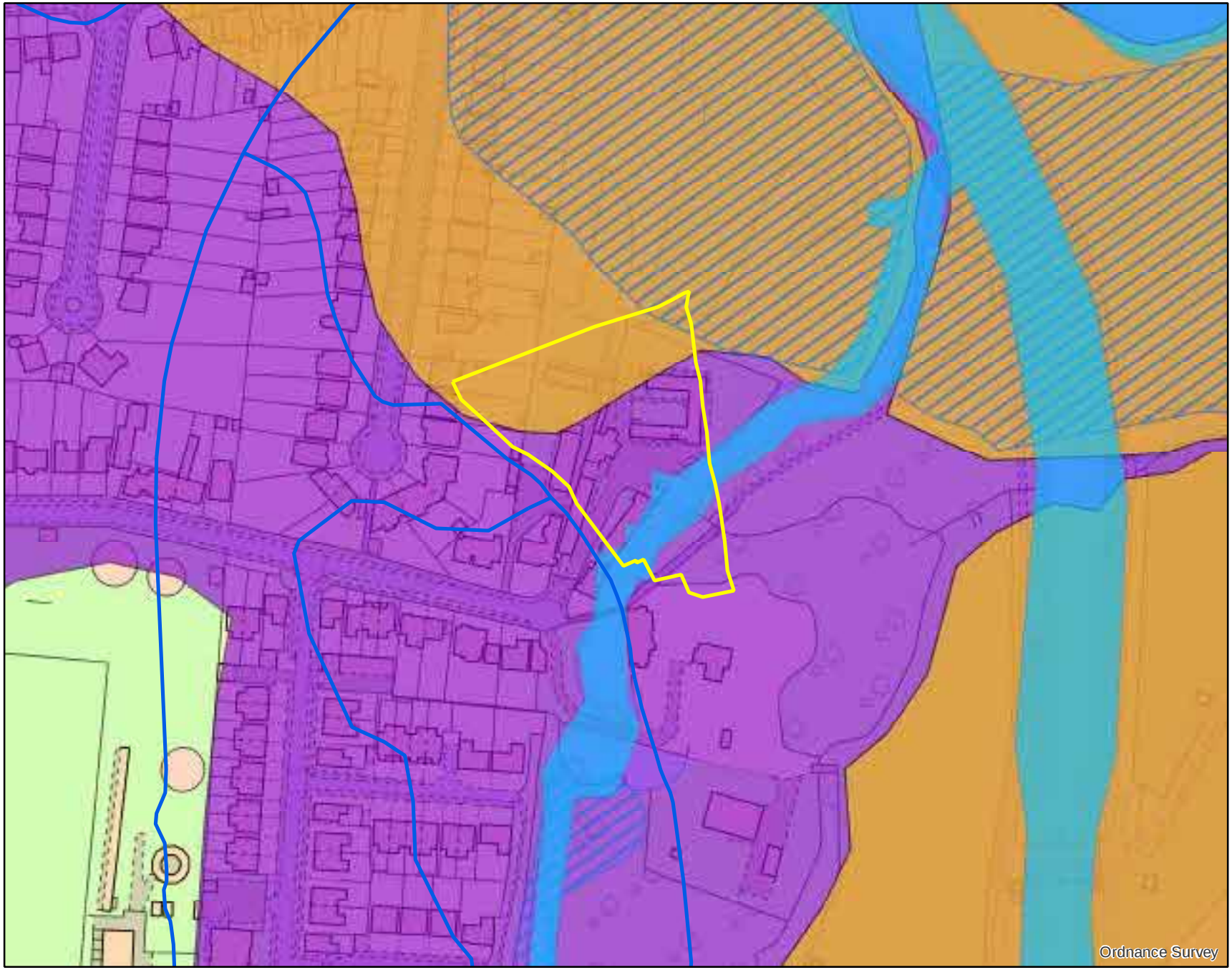
Historic Flood Extents Map
centred on KT8 0BN created 09 August 2023 (Ref: KSL 230767 AC)



Legend

- Statutory Main River
- Site
- 2013 DEC
- 1979 FEB
- 1974 NOV
- 1968 SEPT

Scale 1:2,000

0 50 100

Meters

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Additional Information

Information Warning - OS background mapping

The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

Planning advice and guidance

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.
We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

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Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Flood Risk Assessments guidance

Flood risk standing advice for applicants

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

https://www.gov.uk/flood-risk-assessment-standing-advice

http://planningguidance.planningportal.gov.uk/

https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

https://www.gov.uk/guidance/flood-risk-and-coastal-change

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

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Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

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Customer services line: 01732 223 202
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Product 4 (Detailed Flood Risk) for KT8 0BN
Our Ref: WA/2023/130267

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 seperately)
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.

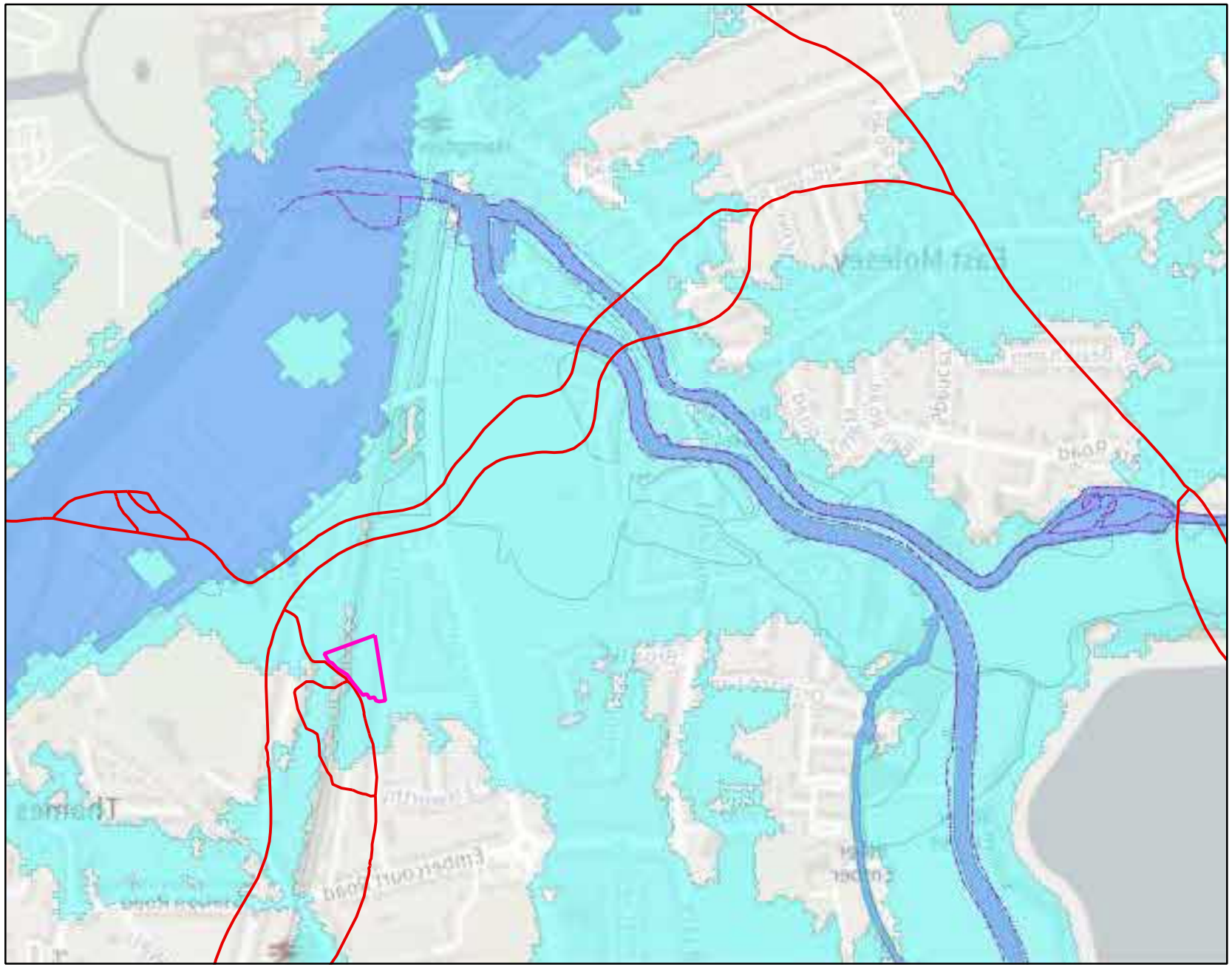
This information is provided subject to the enclosed notice which you should read.
This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

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

Flood Map for Planning centred on KT8 0BN
Created on 21/08/2023 REF: WA/2023/130267



Kilometres

0 0.25 0.5

Legend

- Site
- Main River
- 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.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Defence information

WA/2023/130267

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

WA/2023/130267

Model: Thames (Hurley to Teddington) 2019

Description: The information provided is taken from the Lower River Thames Modelling Study which was completed in December 2019. The model was developed using ISIS-TUFLOW. The flood-frequency behaviour of the Lower Thames is assessed in this project using the multitude of river flow and level records that are available, concentrating mostly on the flow record at the Kingston/Teddington gauge site. Flow records are also available at other gauging sites along the modelled section of the River Thames.

This model fully supersedes the following models: Thames (Lower) Reach 1 & 2 – 2007; Thames (Lower) Reach 3 – 2009; Thames (Lower) Reach 4 – 2010. And partially supersedes: Thames (Henley to Hurley) 2002 (lower extent only)

This model includes the Jubilee River (part of the Maidenhead, Windsor and Eton Flood Alleviation Scheme). The design capacity for the Jubilee River is limited to approximately 180m3/s and is designed to remain in-bank irrespective of any increase in flows in the River Thames. Where appropriate this will need to be considered when assessing flood risk.

There are several points along the Lower Thames where there are interactions between the main river and tributaries. At these point's, other local models will need to be additionally assessed to ensure the correct site specific values are being used. These locations include Chertsey Town, and along the extent of the Chalvey Ditches. The Lower Thames model explicitly modelled the tributary focused flood scenarios in particular the Battle Bourne in Old Windsor and Chertsey and its tributaries. These have been marked as - Battle Bourne/ Chertsey Bourne/ The Cut after the model name.

Throughout the majority of the catchment, the model has replicated the flow and level variations observed from gauges during flood events with a high degree of accuracy (± 150mm), however at some sites this was not possible across the whole event. This reflects local variations rather than a fundamental issue with the model (e.g., Bray, Romney and Penton Hook Lock).

MARLOW: the Thames (Hurley to Teddington) 2019 model (Marlow Domain) remains to be the best available modelling for Marlow, however please note that the Marlow model domain does not include representation of the recently completed Marlow Flood Alleviation Scheme. Since the completion of this model, the Marlow flood defence has been completed and as of January 2022 Marlow post-scheme modelling has been carried out, however the Environment Agency are still in the process of reviewing this modelling internally. All systems will be updated with this new modelling once the review process has been completed.

Model design runs: 1 in 2 / 50% Annual Exceedance Probability (AEP); 1 in 5 / 20% AEP; 1 in 10; 10% AEP; 1 in 20 / 5% AEP; 1 in 30 / 3.3% AEP; 1 in 40 / 2.5% AEP; 1 in 50 / 2% AEP; 1 in 75% / 1.33% AEP; 1 in 100 / 1% AEP; 1 in 100+15% / 1% AEP plus 15%; 1 in 100+25% / 1% AEP plus 25%; 1 in 100+35% / 1% AEP plus 35%; 1 in 100+70% / 1% AEP plus 70%; 1 in 1000 / 0.1% AEP

Mapped outputs: 1 in 5 / 20% AEP; 1 in 100 /1% AEP; 1 in 100+25% / 1% AEP plus 25%; 1 in 100+35% / 1% AEP plus 35%; 1 in 100+70% / 1% AEP plus 70%

Model accuracy: Levels ± 150mm

Modelled in-channel flood flows and levels

WA/2023/130267

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 (+15% 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_00_2018_MRel1776	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514441	167235	7.40	7.97	8.28	8.85	9.21	9.40	9.57	10.28	9.50
061_00_2018_MRel1697	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514440	167315	7.30	7.90	8.23	8.81	9.18	9.37	9.54	10.06	9.47
061_00_2018_MRel1549	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514459	167411	7.13	7.74	8.09	8.69	8.92	9.09	9.37	10.17	9.32
061_00_2018_Mole1259	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514371	167546	7.55	7.74	7.81	8.19	8.54	8.84	9.36	10.17	9.37
061_00_2018_MRel1476	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514514	167521	7.07	7.69	8.06	8.66	8.89	9.06	9.35	10.15	9.30
061_00_2018_MRel1325	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514649	167597	6.96	7.61	8.00	8.60	8.83	9.00	9.28	10.11	9.24
061_00_2018_MRel1187	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514775	167635	6.88	7.54	7.94	8.55	8.79	8.97	9.25	10.06	9.23
061_00_2018_Mole534	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514952	167845	7.34	7.46	7.61	8.19	8.53	8.82	9.19	10.05	9.20
061_00_2018_MRel321	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515332	168170	6.61	7.19	7.60	8.18	8.50	8.74	9.08	9.95	9.10
061_00_2018_MRel242	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515399	168205	6.58	7.14	7.55	8.04	8.40	8.66	9.00	9.90	9.04
061_00_2018_16.149	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515673	168210	6.57	7.12	7.46	7.92	8.29	8.56	8.90	9.76	8.94
061_00_2018_16.144	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515798	168008	6.51	7.06	7.43	7.93	8.35	8.66	9.03	9.94	9.09

				Flood Flows (m3/s)								
Node label	Model	Easting	Northing	20% AEP	5% AEP	3.3% AEP	1% AEP	1% AEP (+15% 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_00_2018_MRel1776	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514441	167235	64.14	87.47	94.76	120.85	138.97	173.73	234.32	386.78	177.67
061_00_2018_MRel1697	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514440	167315	64.13	87.44	94.72	120.79	138.89	170.36	225.66	408.53	172.47
061_00_2018_MRel1549	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514459	167411	64.11	87.39	94.66	120.79	138.10	156.35	172.76	239.34	141.78
061_00_2018_Mole1259	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514371	167546	11.28	15.38	16.66	21.29	24.48	30.59	36.95	39.73	28.67
061_00_2018_MRel1476	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514514	167521	64.10	87.37	94.63	120.80	138.16	156.33	172.10	241.23	142.28
061_00_2018_MRel1325	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514649	167597	64.10	87.34	94.58	120.81	138.18	155.78	174.69	236.99	149.09
061_00_2018_MRel1187	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514775	167635	64.11	87.31	94.54	120.80	134.78	145.09	164.00	239.78	138.96
061_00_2018_Mole534	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514952	167845	11.25	15.35	16.62	21.29	24.41	30.47	36.15	44.61	30.45
061_00_2018_MRel321	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515332	168170	66.21	89.69	96.99	113.29	103.80	98.74	103.78	95.89	91.75
061_00_2018_MRel242	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515399	168205	66.23	89.69	96.98	113.33	98.38	84.53	102.01	86.62	75.34
061_00_2018_16.149	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515673	168210	448.87	596.42	657.94	777.02	883.95	979.75	1099.69	1443.61	1143.87
061_00_2018_16.144	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	515798	168008	449.05	597.15	654.58	768.46	874.71	970.66	1096.86	1522.37	1141.29

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

WA/2023/130267

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

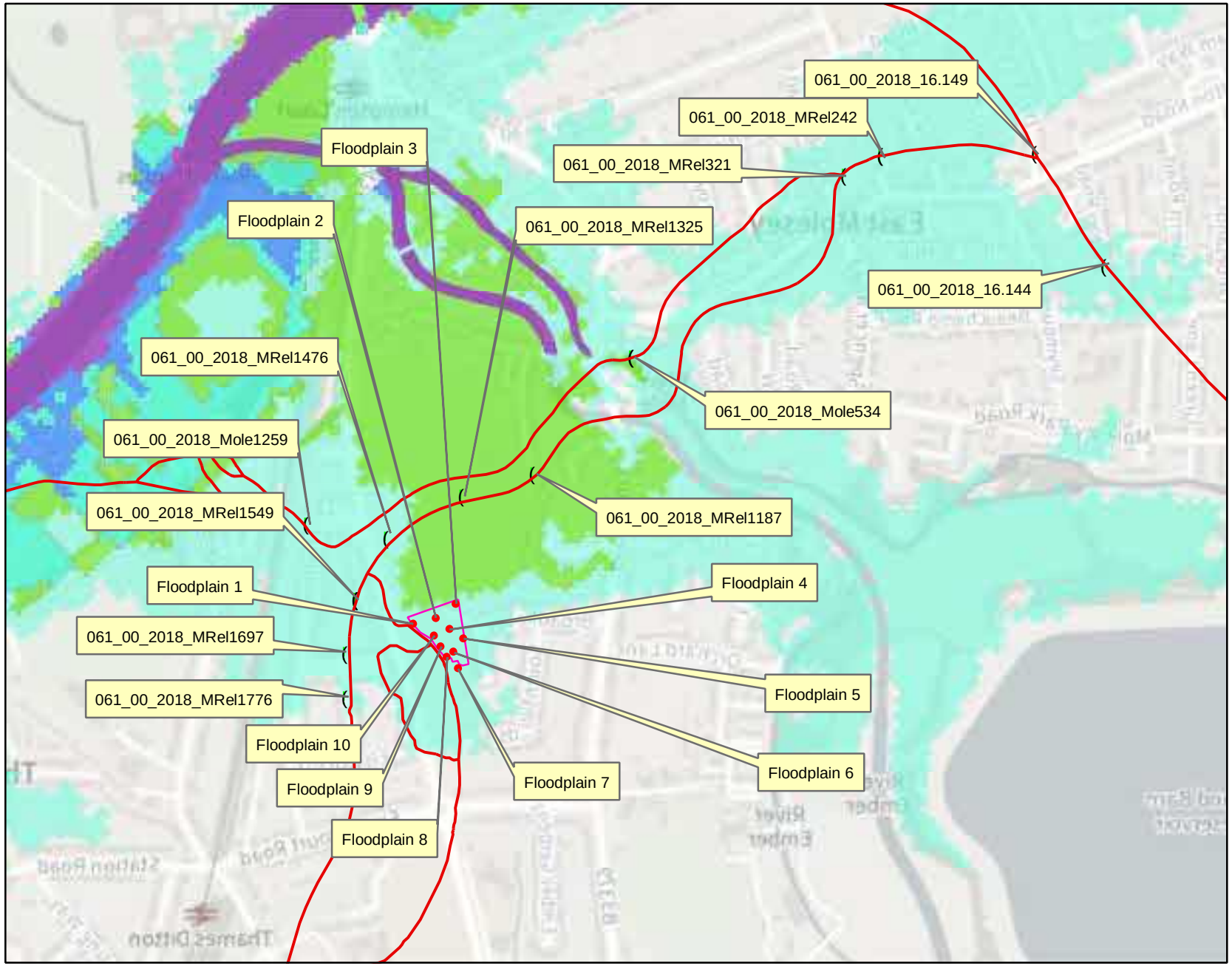
				flood levels (mAOD)								
2D grid cell reference	Model	Easting	Northing	20% AEP	5% AEP	3.3 AEP	1% AEP	1% AEP (+15% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
Floodplain 1	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514557	167367	No Data	No Data	No Data	No Data	8.78	9.10	9.40	10.18	9.33
Floodplain 2	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514597	167378	No Data	No Data	No Data	No Data	No Data	9.03	9.34	10.16	9.29
Floodplain 3	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514633	167403	No Data	No Data	No Data	No Data	8.63	9.02	9.34	10.16	9.29
Floodplain 4	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514622	167358	No Data	No Data	No Data	No Data	No Data	9.02	9.34	10.16	9.29
Floodplain 5	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514646	167340	No Data	No Data	No Data	No Data	No Data	9.02	9.35	10.15	9.29
Floodplain 6	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514629	167317	No Data	No Data	No Data	No Data	No Data	No Data	9.42	10.17	9.33
Floodplain 7	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514637	167287	No Data	No Data	No Data	No Data	No Data	No Data	No Data	10.18	No Data
Floodplain 8	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514616	167309	No Data	No Data	No Data	No Data	No Data	No Data	9.45	10.18	9.35
Floodplain 9	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514606	167326	No Data	No Data	No Data	No Data	No Data	9.15	9.44	10.17	9.35
Floodplain 10	Thames (Hurley to Teddington) 2019 - Hammersmith Domain	514594	167346	No Data	No Data	No Data	No Data	8.84	9.15	9.42	10.17	9.34

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 KT8 0BN
Created on 21/08/2023 REF: WA/2023/130267



Kilometres

0 0.25 0.5

Legend

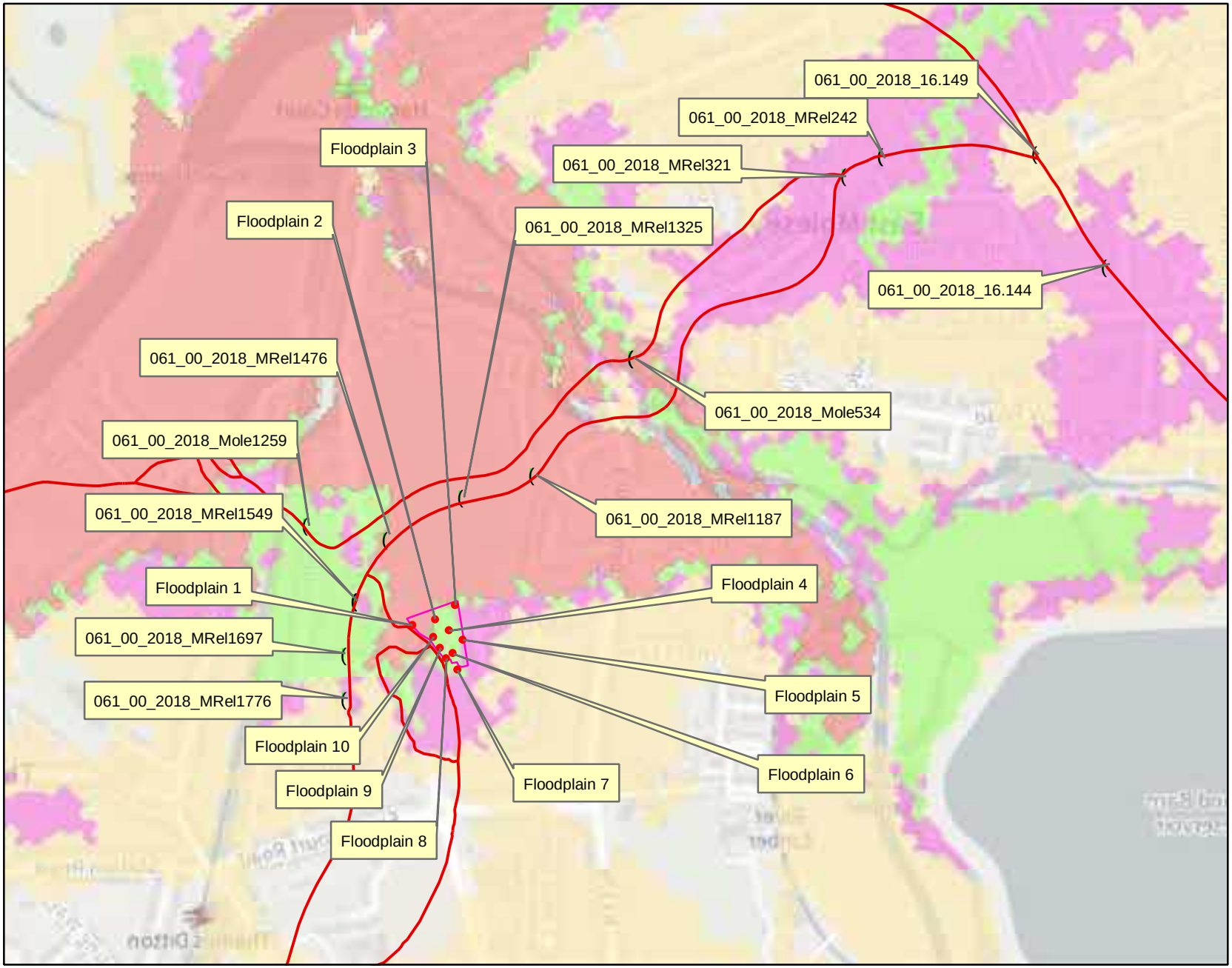
- Site
- Main River
- Node
- 20% AEP Defended Flood Outline
- 5% AEP Defended Flood Outline
- 3.3% AEP Defended Flood Outline
- 1% AEP Defended Flood Outline
- 0.1% AEP Defended Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occuring 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.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Detailed FRA Map centred on KT8 0BN
Created on 21/08/2023 REF: WA/2023/130267



Kilometres

0 0.25 0.5

Legend

- Site
- Main River
- Node
- 1%+15% CC AEP Defended Flood Outline
- 1%+25% CC AEP Defended Flood Outline
- 1%+35% CC AEP Defended Flood Outline
- 1%+70% CC AEP Defended Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occuring 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.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Historic flood data

WA/2023/130267

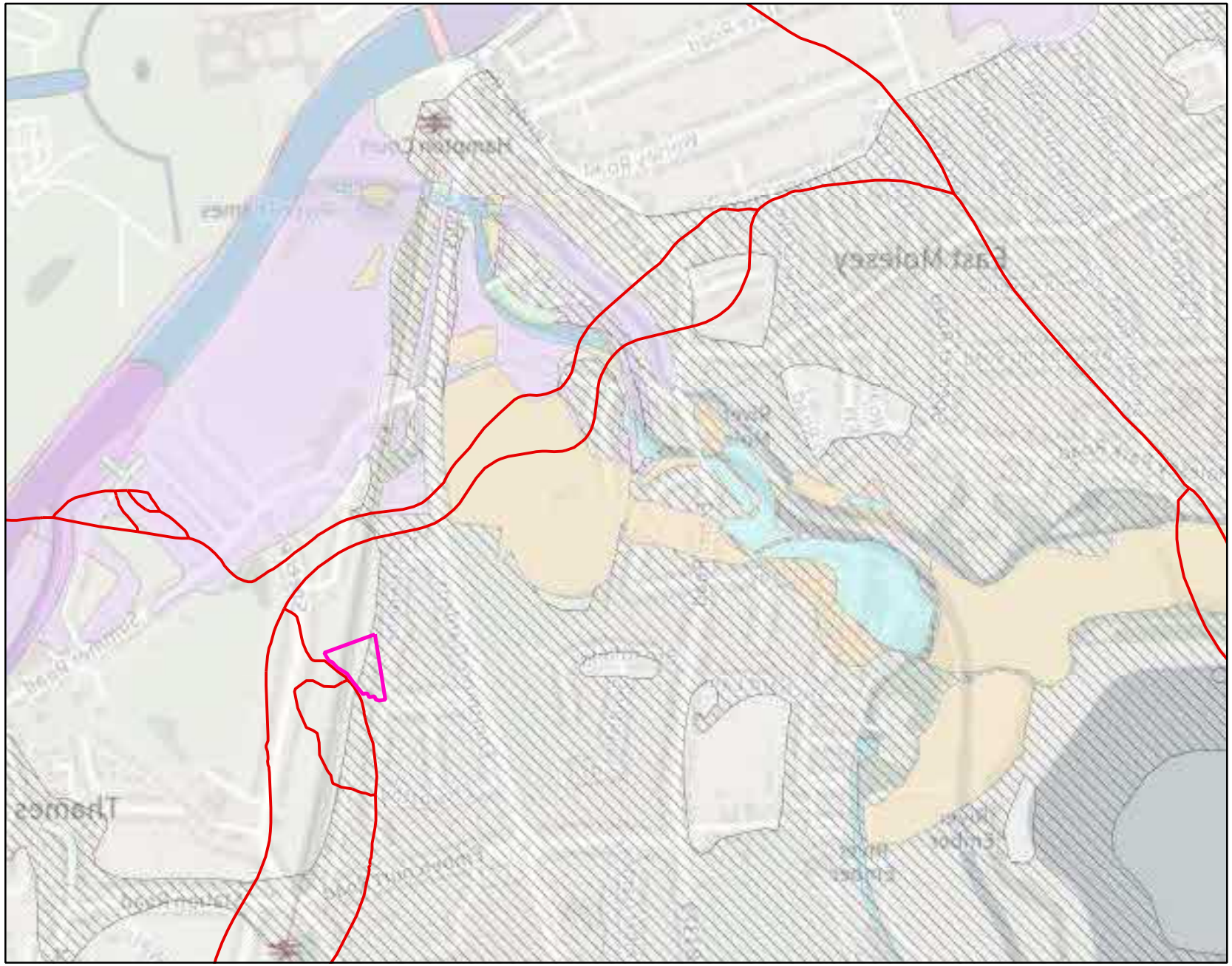
Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619680900462	06SeptemberAutumn1968	01/01/1968	12/12/1968	main river	channel capacity exceeded (no raised defences)
EA0619741100088	06NovemberAutumn1974	01/01/1974	12/12/1974	main river	channel capacity exceeded (no raised defences)
EA0619790200085	06FebruaryWinter1979	01/01/1979	12/12/1979	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 Map centred on KT8 0BN
Created on 21/08/2023 REF: WA/2023/130267



Kilometres

0 0.25 0.5

Legend

- Site
- Main River
- 1947
- 1968
- 1974
- 1979
- 1988
- 1990
- 2000
- 2002/3

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.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

APPENDIX 4 – Flood Warning and Evacuation Plan

The Molesey Venture Centre
Flood Warning and Evaluation Plan

For Lifestyle Residences

KRS.0572.001.R.004.D

May 2023

www.krsenvironmental.com

CONTACT DETAILS

Registered Office:
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Email: [redacted]
Web: www.krsenvironmental.com
LinkedIn: uk.linkedin.com/in/keelanserjeant/

The Molesey Venture Centre	
Project	Flood Warning and Evaluation Plan
Client	Lifestyle Residences
Status	Final
Prepared by	Keelan Serjeant BSc (Hons), MSc, MCIWEM
Date	May 2023

CONTENTS

TABLES & FIGURES

FLOOD WARNING AND EVACUATION PLAN DOCUMENT CONTROL

The site is owned by Lifestyle Residences.

This Flood Warning and Evacuation Plan (FWEP) is owned, maintained and updated by Lifestyle Residences. All stakeholders of the plan are asked to inform the above of any changes in circumstances that may materially affect the plan in anyway. Details of any changes should be sent to Lifestyle Residences.

This plan should be reviewed:

On first occupation;
Every year following first occupation or;
As a result of lessons identified following a flood event or exercise, or;
Following changes of ownership of the property or;
Following changes to any of the names / positions held within the plan; and
Following changes to the Flood Warning process.

All updates/reviews shall be documented, recorded and will be communicated to the occupants and visitors of the site. The review shall be held within Appendix 1 of the FWEP.

Signed:

Dated:

Version No:

A copy of the completed FWEP will be held at The Molesey Venture Centre and shall be made available for inspection by the Environment Agency/Emergency Planners as and if required.

1.0 INTRODUCTION

1.1 Aims and Objectives

The Flood Warning and Evacuation Plan (FWEP) sets out the flood risk of the site, identifies the roles and responsibilities of the Flood Wardens, provides details of the proposed flood actions and sets out the roles and responsibilities of other bodies as well as providing contact details.

This FWEP has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)[1] and associated Planning Practice Guidance[2]. The FWEP is a 'living' document and therefore should be periodically reviewed and updated to provide advice and guidance to occupants and visitors in the event of an extreme flood.

The advice of the emergency services should be followed at all times and on the ground decisions will supersede this FWEP. Where information is not available from the relevant authorities this FWEP is intended to provide action points to protect property and allow early, safe evacuation from this site.

Aim

To minimise the risk of harm to the occupiers and visitors during an extreme flood event.

Objectives

To safely evacuate occupants and visitors from the site in the event of a major flood event.

To ensure safety by raising awareness of the flood risk.

To define the areas of responsibility for those participating in the FWEP.

To establish procedures for implementing the FWEP.

To reduce the risk to life.

1.2 Plan Structure

This FWEP has the following structure:

Section 2 shows the location of the site;

Section 3 details the flood risk to the site;

Section 4 describes the flood risk management methods used to reduce the flood risk;

Section 5 details the flood warnings that are available for the site;

Section 6 provides an overview of the flood evacuation procedures;

Section 7 provides of the evacuation of the site and safe exit route;

Section 8 describes the safe refuge area;

Section 9 provides a flood information notice;

[1] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework.
[2] Ministry of Housing, Communities and Local Government (2014) Planning Practice Guidance - Flood Risk and Coastal Change.

Section 10 provides information on training;

Section 11 provides information on reoccupation of the site; and

Section 12 provides a list of useful telephone numbers, websites, radio and TV stations.

1.3 Assumptions

In order for the following evacuation procedures to be effective:

The site will participate in the Environment Agency flood warning service. The site will register contact details with the Environment Agency' Flood Warnings Service (Floodline 0345 988 1188) in order to receive flood warnings by telephone, text or email.

The flood warning will be passed onto the occupiers/visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

The Safe Access and Egress Route (see Figure 3) will be made available to the occupiers and visitors.

2.0 SITE LOCATION

2.1 Site Location

The site is located at The Molesey Venture Centre, Orchard Lane, East Molesey, KT8 0BN (see Figure 1). The National Grid Reference of the site is 514610, 167350.

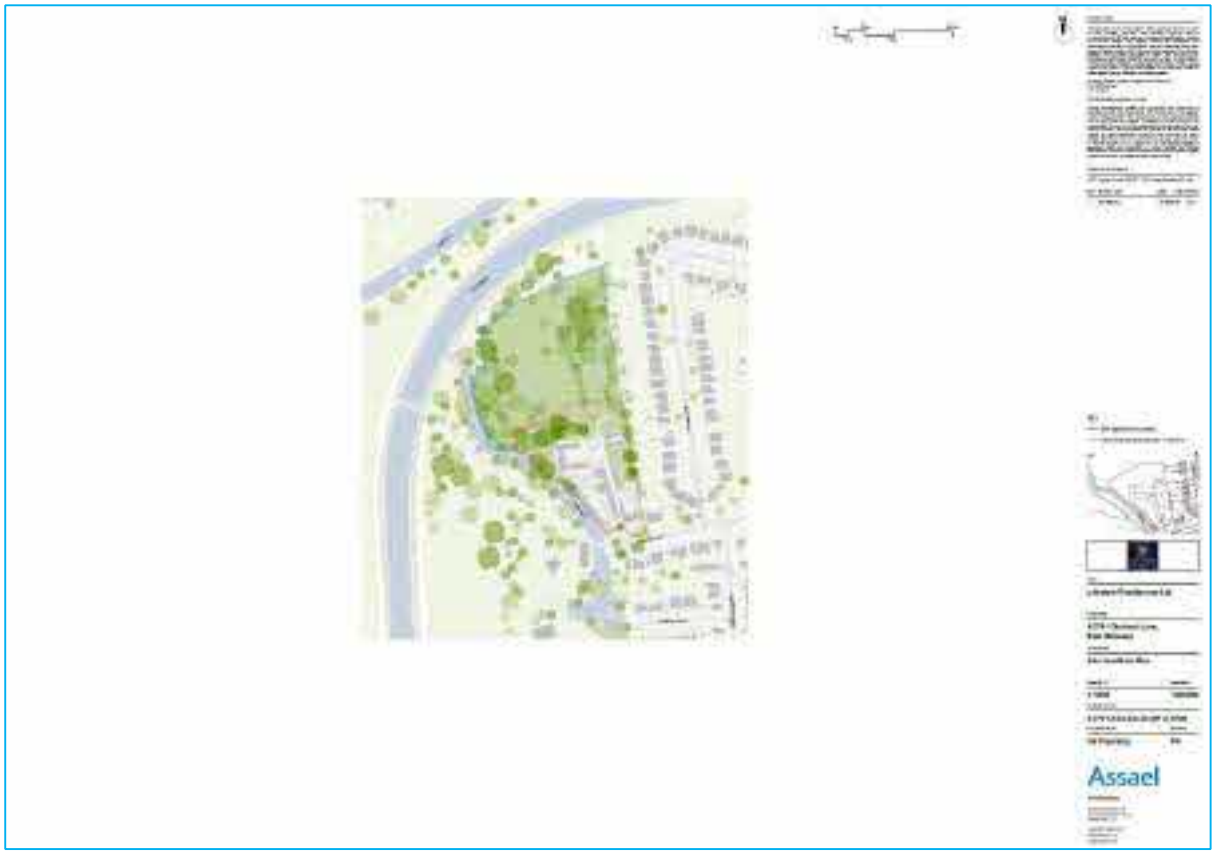


Figure 1 - Site Location

2.2 Proposed Development

Redevelopment of site by way of demolition (or partial demolition) of all existing buildings and the erection of 3 buildings comprising 74 residential units (15 x 1 bed, 48 x 2 bed and 11 x 3 bed) and ancillary facilities for residents, underground and surface level car and cycle parking, mechanical plant, soft and hard landscaping and associated diversion of existing Thames Water pipe.

The proposed finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings is 9.45 metres Above Ordnance Datum (mAOD) with the entrance to the basement set at 9.40mAOD. Further details with regard to the proposed development can be found in Appendix 1 and the accompanying information submitted with the planning application.

3.0 FLOOD RISK

3.1 Flooding

A Flood Risk Assessment (FRA) for the development has been undertaken[3]. A review of the Environment Agency's Flood Zones indicates that the site is located within Flood Zones 1, 2 and 3. Therefore, the site has a 'low to high probability' of river flooding, see Figure 2, with less than a 1 in 1000 annual probability of river flooding in any year (<0.1%) (Flood Zone 1) to a 1 in 100 or greater annual probability of river flooding (>1%) in any year (Flood Zone 3).

The majority of the site is located within Flood Zones 1 and 2 with the south of the site being located within Flood Zone 1 which has a 'low probability' of river flooding with less than 1 in 1000 annual probability of river flooding in any year (<0.1%). The north of the site is located within Flood Zone 2 with a 'medium probability' of river flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) in any year.

A small area of the site to the west, immediately adjacent to the River Ember, is located within Flood Zone 3 with a 'high probability' of river flooding, with a 1 in 100 or greater annual probability of river flooding (>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. The Environment Agency Flood Zones show the worst case scenario.

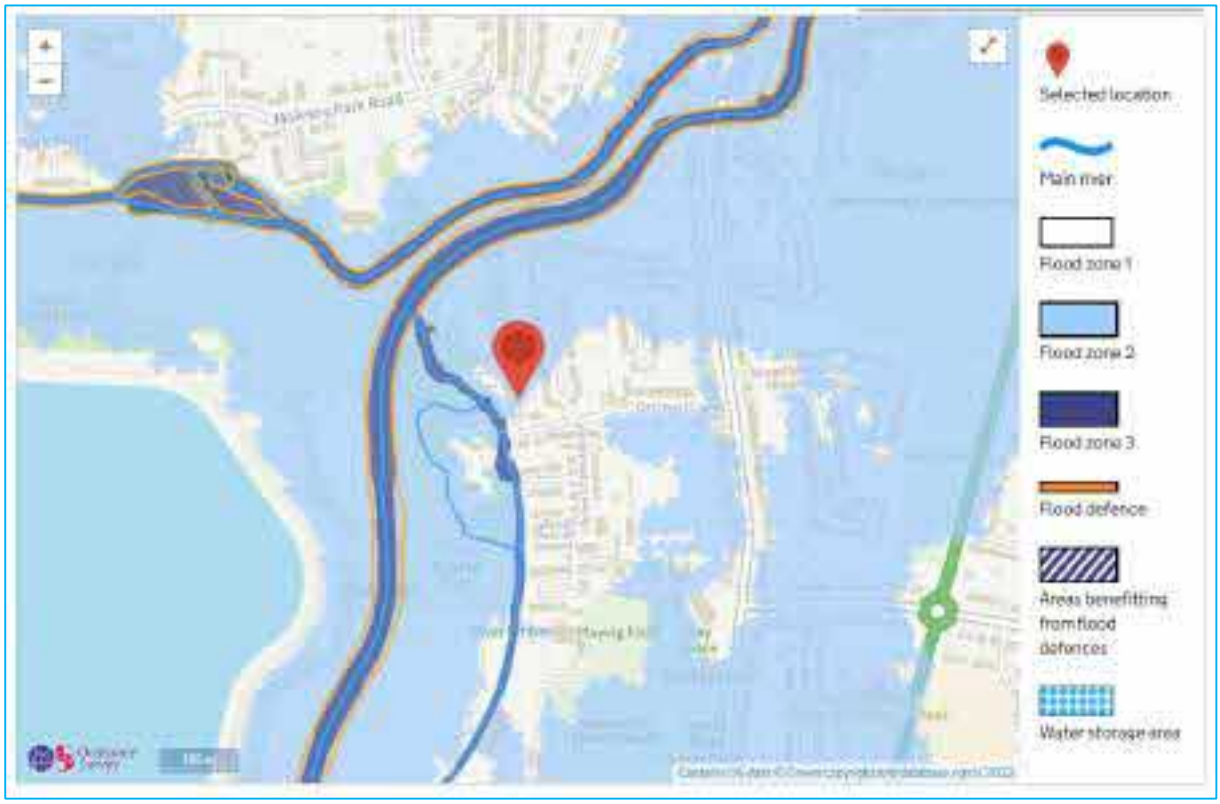


Figure 2 - Environment Agency Flood Zones

[3] KRS Environment Ltd, The Molesey Venture Centre, October 2022, Reference: KRS.0572.001.R.003.D.

4.0 PREVENT, PROTECT, PREPARE

4.1 Flood Prevention

The Environment Agency has confirmed that there are formal flood defences, known at the Lower Mole Flood Alleviation Scheme, within this area which protect the site from fluvial flooding. The Standard of Protection (SoP) of the scheme is 1 in 100 year (1%).

As a result of the great flood of 1968, the Lower Mole Flood Alleviation Scheme was built in the 1970's through to the mid 1980's. This scheme consists of a major channel creation, widening and dredging. 3km of earth bank have been constructed to keep the floods within the original floodplain upstream of Albany Bridge. The river is also now regulated through sluices and other structures designed to minimize flood damage. The scheme design flow is 241 cumecs. Of this, 31 cumecs flows via Royal Mills sluice before reentering the flood relief channel downstream of Viaduct Sluice. The remaining 210 cumecs is diverted through Viaduct Sluice into the flood relief channel.

This site is within an area benefiting from flood defences. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year. If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

4.2 Flood Protection

The flooding sources will be managed and 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. Measured used:

Sequential Approach: The sequential approach has been applied within the site by locating the most vulnerable elements of the development in the lowest risk areas. The proposed buildings will be located on the higher parts of the site, away from the River Ember, at a lower risk of flooding.

Finished Floor Levels: The finished floor levels of the buildings and landscaped areas immediately adjacent to the buildings will be raised to 9.45mAOD and the basement entrance/s will have a threshold level of 9.40mAOD these will provide more than adequate freeboards above the floodwater levels.

For the buildings a minimum freeboard of 0.92m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.49m above the 1 in 100 year (+20%) event will be provided. For the basement entrance/s a minimum freeboard of 0.87m above the 1 in 100 year (+12%) event and a minimum freeboard of 0.44m above the 1 in 100 year (+20%) event will be provided.

A combination of resistance (proofing) and resilience measures will be included to provide further protection. This is discussed below.

First Floor Accommodation: Accommodation will be located on the first floor as well as the ground floor of the buildings. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be 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 Resilience and Resistance Measures: To make the buildings more resistant to seepage the following measures will be incorporated. Sealant will be used around external doors and windows. All external doors and windows will be constructed from durable materials and the walls of the buildings will be thick.

To improve the building resilience to flooding the following measures will be incorporated. All electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor level of the house. Non-return valves will be fitted to the drains within the last manhole before discharge of water to the sewers.

Flood Warning: The site is located in a flood risk area therefore; the buildings will participate in the Environment Agency flood warning telephone service. The site will register contact details with the Environment Agency' Flood Warnings Service.

Flood Warning and Evacuation Plan: A FWEP outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may has been developed, this plan.

Safe Access and Egress Route: The Safe Access and Egress Route indicates the exit route that all people (i.e. occupants and visitors) on site should follow once a flood warning has been received.

4.3 Preparation for Flooding

The owner of the site should consider the following actions prior to occupation:

- Distribute a copy of this FWEP to the Emergency Planning department at Elmbridge Borough Council.
- Distribute a copy of this FWEP to the relevant occupants.
- Train householders in the procedures to be followed in response to receipt of the flood warning (see Section 7).
- Assemble a flood kit for use by householders in an emergency – including important documents, torch, waterproof high visibility jacket, first aid kit and blankets.
- Complete the list of useful contacts (see Section 12).
- Ensure that occupants have been shown how to turn off electricity, gas and water in an emergency.
- Acquire any flood protection items (e.g. flood boards, air brick covers etc.). The National Flood Forum lists some of the products available at http://bluepages.org.uk/
- Confirm that the insurance policy is adequate.

5.0 ENVIRONMENT AGENCY FLOOD WARNINGS

5.1 Flood Warning Service

In England the Environment Agency operates a Flood Warning service in areas at risk of flooding from rivers and the sea, which relies on direct measurement of rainfall, river levels, tide levels and in-house flood forecasting models, as well as rainfall data and information from the Met Office. This service operates 24 hours a day, 365 days a year.

The Environment Agency uses three Flood Warnings Codes (see Table 1). They can be issued in any order, usually ending with an 'all clear'. They are issued by the Environment Agency through Floodline Warning Direct which is a free service. This provides flood warning via their website, telephone, mobile, email, SMS text message and fax.

Table 1 - Environment Agency Flood Warning Codes

Flood Warning Code	Key Message	What it means	Timing
	'Flooding of low-lying land and roads is expected. Be aware, be prepared, watch out!'	Warn people of the possibility of flooding and encourage then to be alert, stay vigilant and to make early preparations for flooding	2 days to 2 hours in advance of flooding
	'Flooding of homes and businesses is expected. Act now!'	Warn people flooding is expected and encourage them to take immediate action to protect themselves and their property	1 day to ½ hour in advance of flooding
	'Severe Flooding is expected. There is extreme danger life and property. Act now!'	Warn people of significant risk to life or significant disruption to communities caused by widespread or prolonged flooding, and encourage them to take immediate action to protect themselves and follow the advice of the emergency service	When flooding poses a significant threat to life
Warning No Longer in Force	'Flood warnings and flood alerts that have been removed in the last 24 hours!'	Warnings are removed to inform people that the threat has now passed	When river or sea conditions begin to return to normal

It should be noted that such warnings are issued in respect of the flood risk within the wider catchment area and may not specifically apply to the site itself and its immediate neighbourhood; in other words, the Environment Agency's Flood Warning Service may issue a Flood Alert which may not be applicable to the site. The site therefore should not solely rely on the Flooding Warning Service and should make use of other sources of information regarding severe weather such as the Met Office

(www.metoffice.gov.uk) the National Flood Forum (https://nationalfloodforum.org.uk/) and the Environment Agency website (https://www.gov.uk/government/organisations/environment-agency) and local radio/TV.

Flood warnings identify a potential rather than an actual threat. It is therefore noted that not all events will result in an automatic progression from one warning to another with the end result being flooding of the site. It is possible for smaller events to trigger initial warnings with water levels dropping before flooding of the site occurs. However, in the very unlikely event of a breach there may be a limited flood warning.

The Environment Agency has provided a useful leaflet, see Appendix 2, which highlights the key actions to take before, during and after a flood, as well as providing links to companies and organisations where additional information can be obtained.

When a flood is expected, Elmbridge Borough Council and the local emergency services will be responsible for public care and safety.

5.2 Floodline

The site is located in a flood risk area; therefore, the site will participate in the Environment Agency Flood Warning service in order to receive flood warnings by telephone, text or email. The site will register contact details with the Environment Agency' Flood Warnings Service (Floodline 0345 988 1188) in order to receive Flood Warnings for the following Flood Warning area.

The occupants of the site will be made aware of the Environment Agency Floodline telephone number (on 0345 988 1188) and the flood warning meaning. A Flood Warden for the site will be appointed from the staff of the site. The Flood Warden will 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 Flood Warden will:

- Inform occupants and visitors of the existence of the FWEP where required.
- Ensure that the site is registered with the Environment Agency Floodline service.
- Ensure that flood protection equipment and materials, if required, are installed and maintained including any flood boards and pumps.
- Co-ordinate with the emergency services.
- Identify equipment or possessions that require special protective measures and co-ordinate the action required to prevent their damage in the event of a flood.
- Monitor flood levels and keep, occupants and visitors informed.
- Review the FWEP annually.
- To further manage the flood risk and to confirm that the exit route is safe an on-the-spot risk assessment will be undertaken by the Flood Warden, if required.
- Liaise with the Environment Agency on a regular basis.
- The needs of disabled, people who have reduced mobility or pregnant visitors will also need to be taken into account by the Flood Warden.

The FWEP will be passed onto the occupants and visitors of the site who will be made aware of the Safe Access and Egress Route, Environment Agency Floodline, Flood Warning Notice and Flood Warning Codes. Any flood warnings will be passed onto the occupants and visitors of the site verbally,

by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

5.3 How to Register

1. Internet using the Environment Agency's website:

   https://www.gov.uk/sign-up-for-flood-warnings

2. Telephone

   Calling Floodline on 0345 988 1188

5.4 Floodline by Telephone

During a heavy rainfall event, call Floodline on 0345 988 1188.

5.5 Updates

The Environment Agency website contains regular updates and information (https://flood-warning-information.service.gov.uk/warnings).

The Environment Agency also actively provides updates of flood warnings on Twitter (www.twitter.com/EnvAgency) and Facebook (www.facebook.com/environmentagency).

The Met Office issues weather forecast for the UK, including severe weather warnings (www.metoffice.gov.uk/weather/uk/se/se_forecast_warnings.html).

The Met Office regularly updates weather warnings on both Twitter (www.twitter.com/metoffice) and Facebook (www.facebook.com/metoffice).

To view and receive flood alerts via Facebook, you can use the FloodAlerts Facebook app (https://www.facebook.com/FloodAlerts).

To monitor river levels in your area and upstream you can use the GaugeMap website (https://www.gaugemap.co.uk).

Each river gauge is also available to follow via Twitter (https://twitter.com/gaugemap).

Social media sites are also useful sources of information.

During times of heavy rainfall, occupants should check TV/radio stations for information regarding flood risk. This may allow extra preparation time, enabling the property, contents and people to be better protected against the effects of flooding. Updates and news on flooding for the local area can be obtained from local television news reports and from local radio stations, including the following sources.

Radio Stations

BBC One/Two

Capital FM

Radio Jackie 107.8

Television Stations Issuing Flood Alerts and Warnings

BBC News Channel

BBC One/Two

ITV News Channel

ITV1

Sky News Channel

5.6 Estimated Flood Warning Time

The likelihood of a rapid river level rise and possible rapid inundation of urban areas within this area and posing a risk to life is considered to be minimal. The Environment Agency, with its current flood warning system, to provide forewarning of two (2) days of a pending flood event. There is therefore considered to be a substantial lead time before the peak of a flood event at the site. A more accurate estimation will be provided when the flood warning is made.

6.0 FLOOD PROCEDURES

6.1 Procedures

The actions that need to be followed as part of the FWEP are given below. They should be read in conjunction with all the information within this plan. The strategy in this FWEP is for evacuation to take place before flooding of the site occurs, people should take immediate action to protect themselves and also follow the advice of the emergency service'. Where possible you should make arrangements with family or friends for shelter.

Based on the likely flood risk and associated warning time that is feasible, it is considered likely that there would be sufficient time to evacuate in dry conditions and regardless, also seek refuge on upper levels as appropriate: taking with you any important documents, bottled water, essential medicines and food sufficient to support you until rescue (see information related to "grab-bag" / flood Kit).

You should not assume that the emergency services will be able to assist you with the evacuation; their focus will be directed to those in greatest need.

6.2 General Conditions

Occupiers should be to be aware of the FWEP and the Safe Access and Egress Route and procedures that may need to be put in place in the event of flooding. Occupiers should be aware of changes in flood warning status such as forecasted bad weather. Occupiers should ensure flood kits are stocked and ready at all times.

6.3 Flood Alert Status Issued

'Flooding is possible - be prepared!**'**

In the event of the area being placed on **'**Flood Alert**'**, occupiers should prepare themselves to evacuate, and make arrangements to vacate the premises at short notice if required. Vehicles should be moved to higher ground in preparation for a more severe flood warning.

A **'**Flood Alert**'** will be given 2 days to 2 hours in advance of flooding.

Occupiers and visitors should monitor the situation closely by calling the Environment Agency on 0345 988 1188 for regular updates, follow the Met Office website or alternatively through local and national media.

6.4 Flood Warning Status Issues

'Flooding expected – Immediate action is required!**'**

Should the flood warning code be escalated to 'Flood Warning', residents and visitors should get ready to evacuate the site. Move any critical equipment and important belonging within the ground floor to safe locations on the first floor.

A **'**Flood Warning**'** will be given 1 day to ½ hour in advance of flooding.

It is possible that the Flood Warning alert would be triggered by the Environment Agency, although this depends on a number of factors rather than simply the water level and may not accurately reflect the risk to individual properties. Occupiers and visitors should monitor the situation closely by calling

the Environment Agency on 0345 988 1188 for regular updates, follow the Met Office website or alternatively through local and national media.

6.5 Severe Flood Warning Status Issued – Evacuate if appropriate

'Flooding poses a significant danger to life!'

Should the Environment Agency's flood warning code be escalated to the highest level, **'**Severe Flood Warning**'** and, if evacuation has not already been completed, the safest course of action is to evacuate the site. An appropriate Safe Access and Egress Route are identified in Section 7.

Should floodwater be present on the site prior to evacuation of the premises, it is considered unsafe to evacuate. Residents and visitors should remain in the buildings as the design floodwater level is not expected to internally flood the buildings. Residents and visitors should monitor the situation closely by calling the Flood Warning Service on 0345 988 1188 for regular updates or alternatively through local and national media. Residents should monitor the flood progression. Note that there is a risk this may occur before the Environment Agency issues their Severe Flood Warning status.

Residents and visitors should co-operate with the emergency services and call 999 if immediately in danger. At this stage Elmbridge Borough Council Emergency Team, the emergency services and the Environment Agency should be managing the situation, with widespread flooding potentially over a large area, and will endeavour to provide advice on an evacuation route, shelter and assistance to evacuees.

An appropriate Safe Refuge Area is identified in Section 8, if evacuation from the site has not been possible.

6.6 Warning No Longer in Force

Reoccupation can be considered once approval has been given by the emergency services after a **'**Warning No Longer in Force**'** has been issued. More details of the reoccupation procedure is given in Section 11. Occupiers and visitors should monitor the situation closely by calling the Environment Agency on 0345 988 1188 for regular updates, follow the Met Office website or alternatively through local and national media.

7.0 EVACUATION

7.1 Personal Safety in a Flood Event

The following should be considered carefully by occupants and visitors before evacuation the premises during a flood event:

1. Do not put yourself at risk in the event of a flood, personal safety is paramount.
2. Be aware that floods bring their own unique hazards, the majority of which will be hidden from view.
3. Never try to swim through fast flowing water as you could be swept away or struck with an object from the floodwater.
4. Avoid wading through floodwater as this is likely to be contaminated with raw sewage as drains and sewers overflow.
5. Stay safe in a flood event.

7.2 Evacuation Procedure

Occupants and visitors should initially undertake a visual check to ensure that no floodwater is present within Orchard Lane prior to evacuation. If the visual check determines that the floodwater is yet to reach Orchard Lane, occupiers and visitors should exit via the main access to the site. Occupants and visitors should proceed swiftly but calmly onto the pathway of Orchard Lane. Occupiers and visitors should not take from the property any bulky items that may impede their evacuation. Occupiers and visitors should provide assistance to those who may need it, such as children, the elderly or disabled.

The emergency services should be contacted if floodwater has reach the site entrance and the occupants are unable to evacuate the site. As this point they should consider safe refuge, as detailed within Section 8.

Once on Orchard Lane the most appropriate routes are identified in Figure 3. People should make their way to areas outside of the flood zone via Orchard Lane and Esher Lane (B3379) to the north. Facilities such as cafes, shops etc. are located to the north of the site which may be used in the event of a flood event. A safe access and egress route, including emergency access can be maintained for vehicles and/or by foot.

In the event of a Severe 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 Safe Access and Egress Route shown in Figure 3.

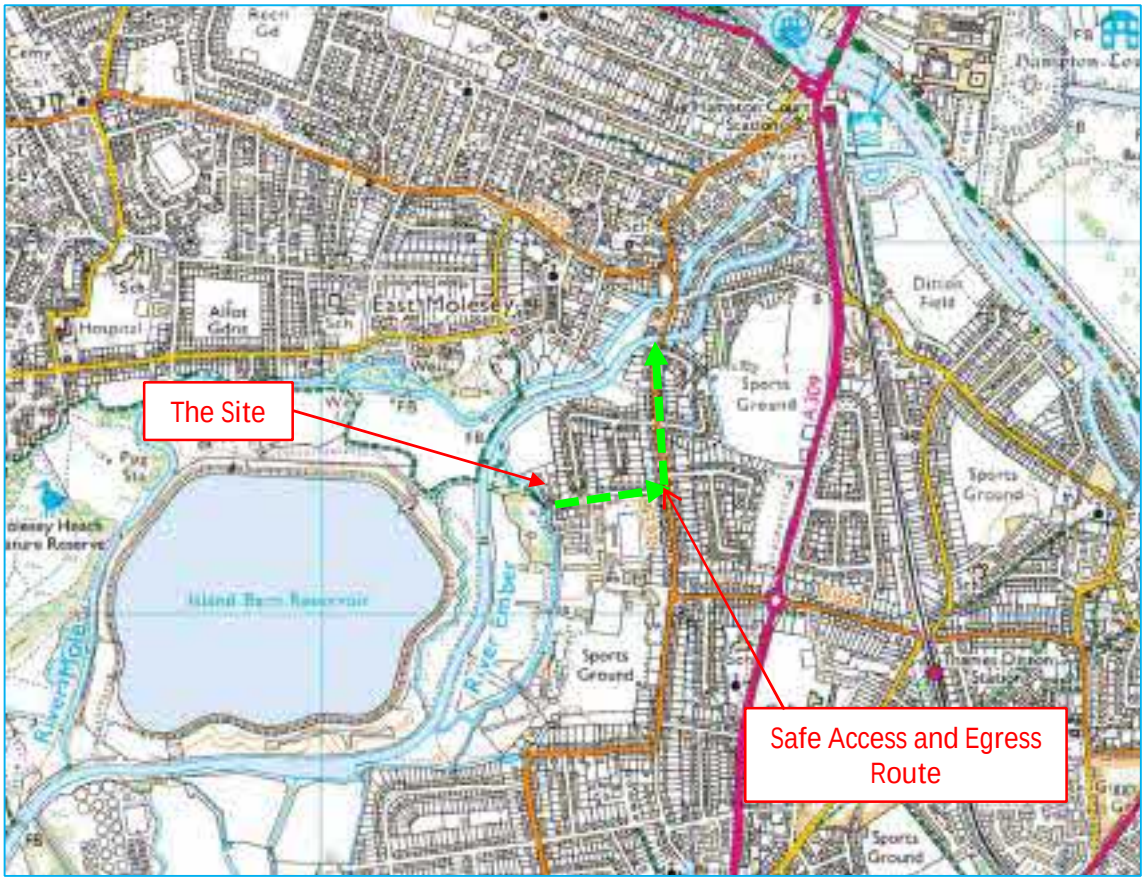


Figure 3 - Safe Access and Egress Route

If occupants are going to be evacuated to an off-site place of refuge via the Safe Access and Egress Route, an easily accessible "grab-bag" / flood Kit will be prepared and kept in a safe and dry place. The kit should include:

Torch (windup or spare batteries)

Blankets

Waterproof clothing

Wellington boots

Water

Non-perishable food (such as biscuits, crackers, cereal bars, dried fruit, sweets, tinned meats/fruits/vegetables and bottled water etc.)

Portable radio (windup or spare batteries)

Rubber gloves

Medications

Mobile phone

A copy of this FWEP

8.0 SAFE REFUGE

8.1 Safe Refuge Area

In the event that evacuation of the site is not possible then safe refuge is possible within the site. Accommodation will be located on the first floor as well as the ground floor of the site. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be located a minimum of 2.50m above the ground floor finished floor level 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.

If required further facilities located within the vicinity of the site are available. The primary responsibility of Elmbridge Borough Council during a flood is to provide temporary accommodation to any displaced people until such time that they are in a position to return to their homes or their insurance companies can arrange temporary accommodation for them. This shelter is provided in the form of reception centres, and provides a warm dry place to sleep and basic facilities including shower, food, etc.

9.0 FLOOD INFORMATION

9.1 Flood Information Notice

Flood Information Notices are intended to complement the Flood Evacuation Procedures, whilst being a standalone directive, guiding occupants and visitors through appropriate actions when a Flood Warning occurs. Figure 4 is an appropriate Flood Information Notice.

Flood Information Notice

When a Flood Warning is received the Flood Warden will decide whether to initiate the FWEP. If the FWEP is initiated the following procedure should be followed:

1. When the Flood Warden receives Flood Warning site occupants, occupants and visitors will be made aware of its receipt.
2. The evacuation plan will be initiated.
3. The Flood Warden is to initiate shutdown of the site before evacuation and turn off power at the mains.
4. Be alert for gas leaks - Turn all gas appliances off, and do not smoke or use candles, lanterns, or open flames unless you know the gas has been turned off.
5. Stay in pairs - When following shutdown and evacuation procedures, work in pairs and stop work if it is not safe to finish procedures.
6. Listen for evacuation instruction - evacuate if you are told to do so
7. If instructed to evacuate follow the routes marked on the Safe Access and Egress Routes.
8. Leave the site with your vehicles ASAP following the routes marked on the Safe Access and Egress Routes.
9. Be careful walking through flowing water - Currents can be deceptive, and shallow, fast moving water can knock you off your feet. The Flood Warden will check the water depth.
10. Don't swim through fast flowing water - You may get swept away or struck by an object in the water.
11. If you have to walk in standing water, use a pole or stick to ensure that you do not step into deep water, open manholes or ditches. The water depth will be checked by the Flood Warden.
12. Be careful driving through a flooded area - You may not be able to see abrupt drop-offs and only half a metre of flood water can carry a car away. The Flood Warden will check the water depth.
13. Stay away from power lines - Electrical current can travel through water. Report power lines that are down to the power company.
14. Look before you step - After a flood, the ground and floors are covered with debris, which may include broken bottles, sharp objects, nails etc. Floors and stairs covered with mud and debris can be slippery.
15. Avoid direct contact with floodwater - It may be contaminated with sewage, oil, chemicals or other substances.
16. Refer to the SAFE EXIT PLAN and BE CAREFUL.

Figure 4 - Flood Information Notice

10.0 TRAINING

10.1 Flood Training

Occupiers of the site shall be trained as part of the site induction prior to occupation. Relevant occupiers shall be informed of the potential flood risk and requirements of FWEP.

Occupiers and visitors with increased needs or vulnerability may require support during a potential evacuation/refuge situation. These needs must be assessed on an individual basis and specific Flood Wardens may need to be appointed to provide individual support.

In addition, the site owner will ensure that the FWEP is exercised on an annual basis, where exercising would involve an evacuation drill as well as a Table-Top exercise to ensure all occupants are aware of their duties and responsibilities.

The Flood Warden and occupants should prepare a flood Kit and kept in a safe and dry place. The kit should include:

Torch (windup or spare batteries)

Blankets

Waterproof clothing

Wellington boots

Water

Non-perishable food (such as biscuits, crackers, cereal bars, dried fruit, sweets, tinned meats/fruits/vegetables and bottled water etc.)

Portable radio (windup or spare batteries)

Rubber gloves

Medications

Mobile phone

A copy of this FWEP

11.0 SITE REOCCUPATION

11.1 Returning to the Premises

It is likely that it will not be possible to access the site for a number of days. Do not attempt to enter the site until such a time as the Emergency Services/Environment Agency have given the all clear.

Once the rainfall event has passes, and the flood warning has been removed, it may be possible to return to the property if it has been evacuated or it may be possible to vacate the property if people remained inside. Only return to the buildings once it is safe to do so and once permission has been granted by any emergency services in attendance.

11.2 First Steps

Floodwater may be still around and could be contaminated (see Appendix 3). Take care as there may be hidden dangers in the flood water like sharp objects, raised manhole covers and pollution. Flood water could have caused structural damage to the building.

Upon returning to the site it will be important to consider some of the hazards that may be present on the site following a flood event, including:

Standing water remaining on the site.

Transported debris from within the watercourse of from elsewhere on the site that could be a tripping hazard.

Silt or residue deposited on the site that may be slippery.

Potentially contaminated water.

As a priority, insurance companies should be contacted, and the structural condition of the property should be visually inspected from the outside by a competent professional prior to reoccupation. This is to identify if there has been any damage to the integrity of the building.

In almost all cases the insurance company will send a loss adjuster to look at the building. They will confirm what repairs and replacements are needed and covered by your policy.

11.3 Things to be Aware Of

Flood water can contain sewage, chemicals and animal waste. Always wear:

Waterproof outerwear, including gloves.

Wellington boots.

Face mask.

If the electricity supply is not already switched off at the mains, get a qualified person to do this. DO NOT touch sources of electricity when standing in flood water. Upon entering the premises, a clean-up operation can commence. Occupiers may need to:

Commission immediate emergency pumping/repair work if necessary, to prevent further damage.

Open doors and windows to ventilate the property.

Contact local authority or health service to find out where you can get help to clean up.

Contact utility providers to have them check services before re-use.

Dispose of all food that may have been in contact with floodwater as contamination could have occurred. For further assistance, contact your local authority Environmental Health department for advice.

Keep comprehensive records of flood damage (photographs, videos etc.).

Contact your insurance broker (24 hour) Emergency Helpline. They will be able to provide information on dealing with compensation claims.

Get an advice guide to repairing damaged property from Floodline (0345 988 1188).

12.0 USEFUL INFORMATION

12.1 Organisations Involved in a Flood Response

Elmbridge Borough Council - 0114 273 4567

Thames Water - 01372 474474

Surrey Police - 101

Surrey Fire and Rescue Service - 03456 009 009

Environment Agency (General) - 03708 506 506

Environment Agency Floodline - 03845 988 1188

Environment Agency Incident Hotline (report flooding) - 0800 807 060

In an emergency only call 999

12.2 Radio Station

BBC One/Two

Capital FM

Radio Jackie 107.8

12.3 Television Stations

BBC News Channel

BBC One/Two

ITV News Channel

ITV1

Sky News Channel

12.4 Useful Websites

Environment Agency Flood Warnings:

http://www.environment-agency.gov.uk/homeandleisure/floods/31618.aspx

National Flood Forum

http://www.nationalfloodforum.org.uk

Elmbridge Borough Council

https://www.elmbridge.gov.uk/

Met Office

http://www.metoffice.gov.uk

APPENDICES

APPENDIX 1 – Review Record

Amendment Number	Amendment Location	Amendments	Amendment Effective Date

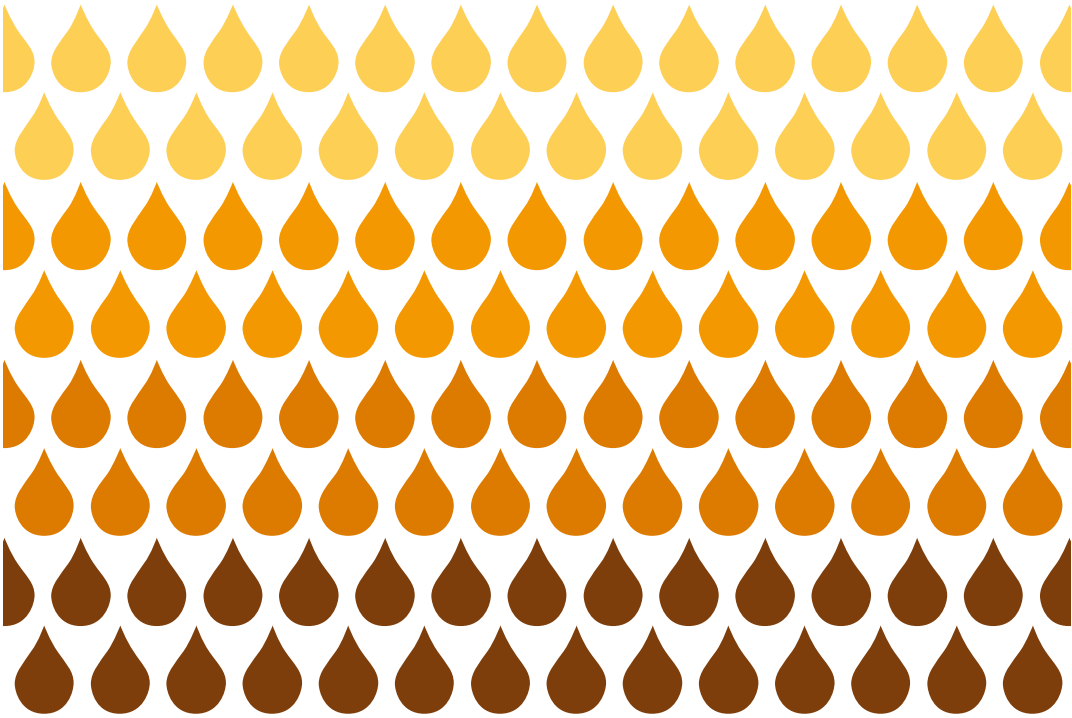
APPENDIX 2 – Environment Agency Flood Warning Information

The following information on health and safety relating to flooding is provided by Public Health England.

Environment Agency

What to do before, during and after a flood

Practical advice on what to do to protect yourself and your property



We are the Environment Agency.

It's our job to make people aware of flooding from rivers and the sea, provide flood warning services and build and maintain flood defences.

This leaflet contains useful information to help you reduce the effects of flooding on you and your property.

Published by:

Environment Agency
Horizon House,
Deanery Road,
Bristol BS1 5AH
Tel: 0370 8506 506*
Email: enquiries@environment-agency.gov.uk
www.gov.uk/environment-agency

*Weekday Daytime calls cost 8p plus up to 6p/min from BT Weekend Unlimited. Mobile and other providers' charges may vary

Your flood warning service

Get the service that's right for you

We provide a free flood warning service to many areas at risk of flooding from rivers and the sea.

Find out if you can sign up for our free 24 hour Floodline Warnings Direct service by visiting our website or by calling Floodline. You can select to receive warnings by phone, text, email, fax or pager.

In some areas we also warn people about flooding using:

- Sirens –usually a wailing sound only activated when a flood is about to happen.
- Loud hailers –a vehicle will drive around repeating the flood warnings.

Other places to get the latest flood update

- www.environment-agency.gov.uk/flood
- BBC Ceefax Page 419 and Digital Ceefax Page 405.
- Local weather, news and travel bulletins.

call Floodline on

0345 988 1188

Open 24 hours a day

- Find out what flood warning service is available where you live.
- Get practical advice on what to do before, during and after flooding.
- Get a Quickdial number for easy access to information on flooding in your area.

your personal flood plan

Start preparing today before a flood happens.
Use this checklist as your flood plan.

1. Know who to contact and how
   - Agree where you will go and how to contact each other.
   - Check with your council if pets are allowed at evacuation centres.
   - Keep a list with all your important contacts to hand.
2. Think about what you can move now
   - Don't wait for a flood. Move items of personal value such as photo albums, family films and treasured mementos to a safe place.
3. Think about what you would want to move to safety during a flood
   - Pets
   - Cars
   - Furniture
   - Electrical equipment
   - Garden pot plants and furniture
   - What else? .....

     .....

Think about who you could ask for help / who you could offer to help, particularly vulnerable neighbours or relatives, in a flood.

Know how to turn off your gas, electricity and water mains supplies

4. Check your insurance cover
   - Check your buildings and contents insurance policy.
   - Confirm you are covered for flooding.
   - Find out if the policy replaces new for old, and if it has a limit on repairs.
   - Don't underestimate the value of your contents.

5. Know how to turn off your gas, electricity and water mains supplies
   - Ask your supplier how to do this.
   - Mark taps or switches with stickers to help you remember.

6. Prepare a flood kit of essential items and keep it handy
   - Copies of your home insurance documents.
   - A torch with spare batteries.
   - A wind-up or battery radio.
   - Warm, waterproof clothing and blankets.
   - A first aid kit and prescription medication.
   - Bottled water and non-perishable foods.
   - Baby food and baby care items.

useful numbers

Your important flood telephone numbers.
Fill this out and keep this leaflet with your flood kit.

Environment Agency Floodline	0345 988 1188
Quickdial number	
Local authority emergency helpline	
Insurance company 24-hour number and policy number	
Local radio station frequency for news alerts and weather updates	
Family and neighbours	
Work phone numbers	
Doctor's surgery	
Local police station	
Vet/kennel/cattery	
Local hotel or B&B	
Gas supplier and meter number	
Electricity supplier and meter number	
Water supplier and meter number	
Electrician	
Plumber	
Builder	

temporary flood protection equipment

Flood protection equipment can help stop flood water getting into your property. Follow manufacturer instructions to put these in place when you get a flood warning.

You can get more information about flood protection equipment in our 'prepare your property for flooding' leaflet on our website.

Floodboards

These fix to frames around windows and doors. They can be washed, stored and used again.

Always remove flood protection equipment once the flood water has gone. This will help your property dry out.

Plastic covers to seal airbricks

These can stop flood water coming in through your airbricks.

Sandbags

Your local council may provide these during a flood, but they may be scarce. You can buy your own sand and bags, or fill pillowcases and plastic bags with earth. Be aware that following a flood they will be contaminated by sewage in the water.

You can get more informtion about using sandbags on our website.

Further steps to protect your property

There are things you can do to your property that will make it easier and cheaper to clean up after a flood. See list on page 22 of this booklet.

Know your flood

FLOOD ALERT

What it means

Flooding is possible.
Be prepared.

What to do

- Be prepared to act on your flood plan.
- Prepare a flood kit of essential items.
- Monitor local water levels on our website.

FLOOD WARNING

What it means

Flooding is expected.
Immediate action required

What to do

- Protect yourself, your family and help others.
- Move family, pets and valuables to a safe place.
- Keep a flood kit ready.
- Turn off gas, electricity and water supplies if safe to do so.
- Put flood protection equipment in place.

warning codes

SEVERE FLOOD WARNING

What it means

Severe flooding.
Danger to life.

What to do

- Stay in a safe place with a means of escape.
- Be ready should you need to evacuate from your home.
- Co-operate with the emergency services.
- Call 999 if you are in immediate danger.

You need to be aware of flooding and keep an eye on the water levels and weather situation at all times. You can do this by checking the flood forecasts and the river and sea levels on our website or by listening to local news and weather forecasts.

You can get up-to-date information about flooding in your area by checking our website or by registering for our FREE Floodline Warnings Direct service.

during a flood

What to do to stay safe in a flood.

In the event of a flood focus on the safety of you and your family

- Cooperate with the emergency services if they tell you to evacuate during flooding.
- Be prepared to act quickly and get yourself to safety.

We use our flood warning services to warn you of flooding from rivers and the sea as soon as we can. But there are some types of flooding we can't predict.

Stay alert to localised flooding

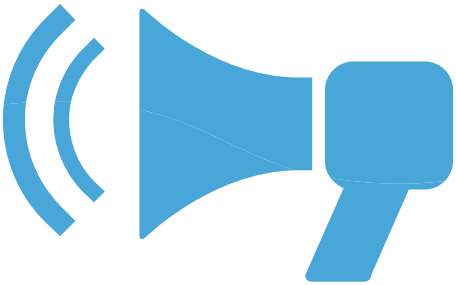
Also known as 'surface water flooding'. This usually happens where drainage systems are unable to cope with heavy spells of rainfall. We cannot give you a direct warning for this type of flooding. Instead we forecast where it might be a problem in certain counties and put a daily flood risk forecast on our website.

You can also find out about the possibility of 'surface water' flooding in your area by checking local weather forecasts.

What to do in an emergency

Follow these simple steps to stay safe:

1. Check in with other people in your household - if they are not at home make sure they are somewhere safe.
2. Gather essential items together either upstairs or in a high place.
3. Fill jugs and saucepans with clean water.
4. Move your family and pets upstairs, or to a high place with a means of escape.
5. Turn off gas, electricity and water supplies when flood water is about to enter your home if safe to do so. DO NOT touch sources of electricity when standing in flood water.
6. Keep listening to local radio for updates or call floodline 0345 988 1188
7. Check in with vulnerable neighbours or relatives.
8. Flood water can rise quickly, stay calm and reassure those around you. Call 999 if you are in danger.



Important! Flood water is dangerous

- Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.
- Avoid walking or driving through it.
- Keep children and vulnerable people away from it.
- Wash your hands thoroughly if you touch it.

Listen to the advice of the emergency services

protect what you can...

Move important items to safety and put flood protection equipment in place when there is a flood warning. Follow manufacturers' instructions carefully to help stop or reduce the flood water entering your property.

Take items upstairs or to a safe place in your property

- Safely store important documents such as insurance papers.
- Move items of personal value such as photos, family films or treasured mementos.
- Move lightweight household belongings you can pick up easily and quickly.
- Move items of furniture that are expensive or harder to repair before cheaper ones.

If possible, move your outside belongings to higher ground

- If the flood water hasn't reached you, move your car to higher ground and move outdoor pets to safety.

Help stop water entering your home

- Put plugs in sinks and baths. Weigh them down with a sandbag, a pillowcase or plastic bag filled with garden soil, or a heavy object.

If you do not have non-return valves fitted

- Plug water inlet pipes with towels or cloths.
- Disconnect any equipment that uses water (like washing machines and dishwashers).

...but evacuate when told

Stay safe, always listen to the advice of the emergency services and evacuate when told to do so.

- Leave your home if the emergency services say so. Refusing to leave on their advice will put you, your family and those trying to help you at risk.
- When you are evacuated you will be taken to an evacuation centre run by your local council. Free food and bedding is provided. Bring spare clothing, essential medication and babycare items if you have an infant.
- Most evacuation centres will let you bring your pets. Take their food. Put cats and small animals in a pet carrier or secure box.
- People running the centres are trained to give you support and advice. They will help you through the stress of a flood and prepare you for what to do afterwards.

after a flood

Recovering from a flood.

First steps

- Take care as there may be hidden dangers in the flood water like sharp objects, raised manhole covers and pollution.
- Flood water could have caused structural damage to your property.

- In almost all cases the insurance company will send a loss adjuster to look at your property. They will confirm what repairs and replacements are needed and covered by your policy.
- If you rent your property, contact your landlord and your contents insurance company as soon as possible.
- If you do not have insurance, your local council should be able to provide information on hardship grants or charities that may be able to help you.

There are a number of things to be aware of when clearing up after a flood

Flood water can contain sewage, chemicals and animal waste. Always wear:

- waterproof outerwear, including gloves.
- wellington boots.
- face mask.

If your electricity supply is not already switched off at the mains, get a qualified person to do this. DO NOT touch sources of electricity when standing in flood water.

You can get water out of your property using a pump and generator. Position the generator outside in the open air as generators produce carbon monoxide fumes which can kill.

Only pump out water when flood levels outside your property start to be lower than inside. This reduces the risk of structural damage.

Shovel mud away evenly from both sides of a wall. This stops pressure building up on one side.

You can clean and disinfect your property using ordinary household products.

A garden hose is useful for washing down. Do not use high-pressure hoses as they blast contaminated matter into the air.

If you are drying your property naturally, keep doors and windows open as much as possible. If using dehumidifiers, close external doors and windows.

If you have gas or oil central heating and it has been checked by an engineer, turn it on. Keep the thermostat between 20-22 degrees centigrade for steady drying.

Local councils usually provide skips and extra rubbish collections for items that your insurance company has agreed you can throw away.

dealing with an insurance c

If flooding has caused damage to large parts of the country, you may have to wait for a loss adjuster to visit you.

Ask the insurance company

- How long it will be before the loss adjuster visits.
- If you are to clean your property or if they will get a company to do it for you.

Always make your own record of flood damage

- Use a permanent ink pen to mark on the wall the height the flood water got to. Do this in every room affected by flooding.
- Photograph or video your damaged property. List the damage to your property and belongings.
- If your insurance policy covers you for loss of perishable goods, make a list of all the foods you throw away. Include any food touched by flood water and anything in your fridge or freezer ruined by loss of power.

Things to help with your insurance claim

- Confirm the insurance company will pay for any service or equipment you need.
- Make a note of all telephone calls. Record the date, name and what was agreed.

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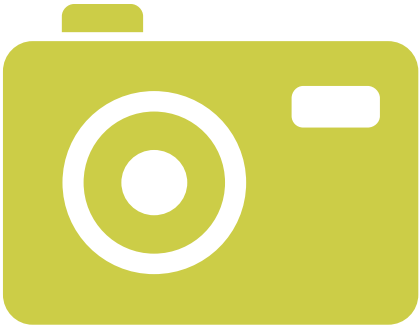
- Keep copies of all letters, emails and faxes you send and receive.
- Keep receipts.
- Don't throw anything away until told (except ruined food).

Important note: the insurance company may only offer to clean and repair something, not replace it.

If you do not have insurance, your local council should be able to provide information on hardship grants or charities that may be able to help you.

Photograph or video record your damaged property



further steps t protect your pr

As you plan your property repairs, you might want to think about ways to protect it from future flooding.

There are things you can do whilst repairing your property that will make it easier and cheaper to clean up after a future flood.

Here are some improvements you can make

Discuss them with your loss adjuster and builder.

- Lay ceramic tiles on your ground floor and use rugs instead of fitted carpets.
- Raise the height of electrical sockets to at least 1.5 metres above ground floor level.
- Use lime plaster instead of gypsum on walls.
- Fit stainless steel or plastic kitchens instead of chipboard ones or have free-standing kitchen units you can move.
- Position any main parts of a heating or ventilation system, like a boiler, upstairs or raised well above the ground floor.
- Fit non-return valves to all drains and water inlet pipes.
- Replace wooden window frames and doors with synthetic ones. They are easier to clean.

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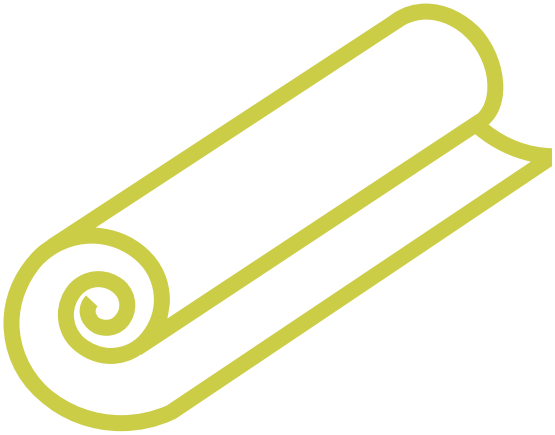
Important!

Always use reputable building contractors. Beware bogus trade people calling door-to-door. Always check references and do not pay in advance.

Lay rugs instead of fitted carpets on your ground floor



temporary housing

Flood repairs can take weeks or months to complete, especially if there has been widespread flooding and builders are scarce. It takes time to dry out a property and some buildings may have to be gutted before repairs can start.

Ask your insurance company or landlord if they will provide you with temporary accommodation. This could be a nearby bed and breakfast, a static caravan or a rented house. You do not have to accept the first place you are offered.

However, if flooding has affected many people, the choice of accommodation may be limited.

If you will be in a temporary property for some time, think about having your post redirected.

Your insurance company should provide you with temporary accommodation

For more information

These organisations have advice, information and services to help you after a flood.

National Flood Forum
www.floodforum.org.uk
01299 403055

The financial ombudsman service
www.financial-ombudsman.org.uk
0300 123 9 123

The Construction Centre
www.theconstructioncentre.co.uk
01926 865825

The British Damage Management Association (BDMA)
www.bdma.org.uk
07000 843 236

Citizens Advice Bureau
www.adviceguide.org.uk
See local telephone directory

CIRIA www.ciria.org/flooding
020 7549 3300

Health Protection Agency
www.hpa.org.uk
01235 822 603/742

Would you like to find out more about us, or about your environment?

Then call us on
03708 506 506* (Mon - Fri 8am to 6pm)
Calls to 03 numbers cost the same as calls to standard geographic numbers (i.e. numbers beginning with 01 or 02).

email
enquiries@environment-agency.gov.uk

or visit our website
www.gov.uk/ environment-agency

incident hotline 0800 80 70 60 (24 hrs)
floodline 0345 988 1188 (24 hrs)

Find out more about call charges: www.gov.uk/call-charges

Environment first: Are you reading this on screen? Please consider the environment and only print if absolutely necessary. If you are reading a paper copy, please don't forget to reuse and recycle if possible.

APPENDIX 3 – Flood Water Health and Safety

The following information on health and safety relating to flooding is provided by Public Health England.

Health advice -
General information following floods

This leaflet provides important health advice and some basic precautions to keep you and your family safe in the event of floods. The latest alerts and general flooding advice are provided by the Environment Agency, see website www.environment-agency.gov.uk

Main health risks

Drowning is the clearest and most immediate health risk during floods. Serious injury can also be caused by falling into fast-flowing water or from hidden dangers under the water, such as missing manhole covers.

There is also a serious danger posed by carbon monoxide fumes from the use of generators and other fuel-powered equipment brought indoors to dry out buildings.

Do not underestimate the stress and strain of being flooded and cleaning up after floods. Take time to consider your and your family's mental health and well-being. Do not overdo it when cleaning up, and remember that tiredness, difficulty sleeping and anxiety are normal in these circumstances.

The risk from bugs in the water

Infection problems arising from floods in this country are rare. Usually any harmful bugs in floodwater become very diluted and present a low risk, but there are a few precautions we can take:

- Wherever possible, try to avoid coming into direct contact with floodwater. If you have to go into the water, wear waterproof gloves and rubber boots and remember to be careful of potentially concealed hazards
- Wash your hands –this is the most important way to get rid of harmful bugs. Use warm, clean water and soap, then rinse and dry your hands after going to the toilet, before eating or preparing food, or after being in contact with floodwater, sewage or with items that have been in the water. Use cold water if there is no warm water, or wet wipes if there is no water at all
- Keep any open cuts or sores clean and prevent them being exposed to floodwater. Wear waterproof plasters.

If you feel unwell

If you feel unwell this does not necessarily mean that you are suffering from any infection. If you are concerned, then call NHS Direct on 0845 4647 or visit your family doctor.

You should contact your doctor if you become ill after accidentally swallowing contaminated water or mud, particularly if you develop diarrhoea, fever or abdominal pain within 10 days of being in contact with floodwater or sewage.

Keeping children safe

- Do not allow children to play in floodwater areas –they won't know how deep the water is and there may be hidden dangers
- Wash children's hands frequently and always before meals
- Parents with infants that are unwell with diarrhoea and vomiting should seek medical advice
- Do not let young children play on affected paved or concreted areas until they have been cleaned. Sunlight and soil help destroy harmful bacteria so it is usually safe for children to play on grass a week or so after the floodwater has gone.
- Wash floodwater-contaminated toys with hot water and detergent. Soft toys can be put in a hot (60°C) machine wash.

Food and floods

The Food Standards Agency advises people not to eat any food that has been touched or covered by floodwater or sewage. Do not eat any produce grown on an allotment or garden that has been flooded, unless it has been cooked.

Wash your hands before and after preparing food. Using clean water, detergent, then a normal kitchen disinfectant, clean and disinfect work surfaces, plates, pans, cutlery, and plastic/glass chopping boards, before preparing food. If you have a working dishwasher, this is best for smaller items.

Throw away any food in your fridge if it has not been working for a few hours. Do the same with any freezer food containing meat, fish or dairy, if your freezer has stopped working. You will also need to discard any food that you would eat frozen, such as ice cream.

Your local health services

If you want to check that your scheduled appointment is unaffected (eg. GP, outpatient, inpatient at local hospital), use the usual local telephone numbers for your health services. In more severe circumstances the local NHS primary care trust may be issuing updates on access to local NHS services and NHS Direct (0845 4647) is also a good source of local health service information.

For more information visit the following websites:

Health Protection Agency –www.hpa.org.uk

Environment Agency –www.environment-agency.gov.uk

Food Standards Agency –www.foodstandards.gov.uk

Health advice -

How to clean up safely following floods

This leaflet provides important health advice and some basic precautions to keep you and your family safe while cleaning up your flooded home. Further general advice is given in the Environment Agency leaflet After a Flood, which can be seen at the website www.environment-agency.gov.uk

Starting off

Put on protective clothing: rubber boots, an apron and waterproof gloves. A standard face mask, such as those sold in DIY stores, is also a good idea if you are scrubbing, hosing or pressure-washing. Goggles offer added protection and they can be reused after thorough washing. Cover any open cuts with waterproof plasters.

Easy does it – the stress and strain associated with flooding and cleaning up afterwards can cause additional health problems. Do not overdo it when cleaning up.

Take care with electrics and gas: do not switch on electrical appliances that have been in contact with floodwater unless a competent electrician has checked them, as there is a risk of electrocution.

Even if gas appliances appear to be working normally, the flue or ventilation systems maybe affected. For safety reasons, have appliances inspected by a Gas Safe Register engineer.

Keep children safe: keep children and pets out of the affected area until the clean-up has been completed. Damaged timber floorboards and tiles, even when they are dried out, may present a risk of injury to the young.

Remember to wash your hands thoroughly after each clean-up session and always before eating or preparing food.

How and what to clean:

Using clean water, detergent, then a normal kitchen disinfectant, clean and disinfect work surfaces, plates, pans, cutlery, and plastic/glass chopping boards, before preparing food. Powerful disinfectants, such as strong bleach are not necessary and may be harmful to surfaces.

Thoroughly clean all other affected hard surfaces, including walls, hard-surfaced floors and furniture with hot soapy water, using an ordinary household detergent. Allow to dry thoroughly as this will also help to destroy germs left behind.

Do not mix detergents with bleaches as this may release hazardous fumes.

Clothing and bedding

Wash these and other soft fabric articles such as children's toys on a hot cycle (60°C or higher), which will destroy most germs that may be present. Wash all clothes worn cleaning up separately to uncontaminated clothes.

Other contaminated soft furnishings that cannot be put in a washing machine will have to be cleaned professionally. If this is not possible they may have to be discarded.

Remember to take regular breaks in the fresh air.

Drying out

Heating and good ventilation will assist the drying process. Leave doors and windows open whenever possible and safe. You can help this process by using fans, air conditioning units and dehumidifiers.

Remember that petrol or diesel generators and other fuel-driven equipment should never be brought indoors. *The exhaust gases contain carbon monoxide, which can quickly build up to poisonous levels without good ventilation.*

Switch off appliances, move to a well-ventilated area and seek medical advice if you experience dizziness, headaches or disorientation.

Dangerous fumes may build up in enclosed areas such as garages and cellars. Make sure these places are well ventilated before you go in and do not let children or animals go inside until the areas are safe.

Mould

Mould on damp walls should disappear as your home dries out. Areas where mould remains can be cleaned with warm water and detergent. Arrange specialist treatment for persistent mould. The contractor will use appropriate protective equipment and precautions. You should not attempt to do this yourself.

Rats and other pests

Rats may be on the move after a flood, but they are generally wary of humans. Put rubbish in hard bins, or if this is not possible, try to keep rubbish bags in an appropriate place away from your home. Avoid approaching rats. If you are bitten by a rat then seek medical advice. Dispose of any dead rats in a plastic bag, wearing rubber gloves.

Living in your flood-damaged home

It is recommended that you only fully re-occupy your home once the above cleaning has been carried out. If you decide to return home with further work outstanding:

- Try to have some heating on at all times, once it has been safety checked
- Consider the use of a dehumidifier
- Ensure the property is well ventilated
- Leave windows open as much as possible but be mindful of security.

If you are living in a flood-damaged home and you become concerned that it is no longer safe to stay in, please contact you local council for advice.

For more information visit the following websites:

Health Protection Agency –www.hpa.org.uk

Food Standards Agency –www.foodstandards.gov.uk

Health advice -
Coping without mains water

This leaflet provides practical and health advice for managing in the home with disrupted or no mains water, and should be read together with latest information from your water company regarding the safety of the water supply.

Follow the advice
If you have a mains water supply, follow the advice of your local water company, which has a duty to protect public health. If there are problems with the supply then alternative water will be made available, such bottled water or bowsers (large water transporters), but in the meantime consumers may be advised to boil tap water before drinking it.

Boiling water for use in the home
If your water company has advised you to boil your tap water, this will be for drinking and for food preparation. This water should be brought to a boil and then allowed to cool before it is used.

In these circumstances it is safe to use unboiled tap water to prepare food that is to be cooked, and for cooking if it will be boiled during the cooking process.

Boiling water can scald, so it is safer use a kettle rather than pots and pans. If you must, use pots and pans then take care with young children and vulnerable people.
Keep panhandles turned inwards so that children cannot reach them.

Water from the hot tap is not suitable for drinking in any circumstance.

Bowsers
Your water company may provide extra supplies of water through bowsers placed locally. This water should be safe to drink, but it requires boiling before use because the containers people use to transfer water from bowser to home may not be clean.

If your mains water is turned off
Only boiled bowser water or bottled water should be used for drinking, brushing teeth, washing food, cooking and making ice. If there is no gas or electricity available to householders to boil water then bottled water should be used in all circumstances.

Cleaning water containers and taps
Use an appropriately diluted bleach solution or sterilising tablets, following the manufacturer's instructions, to clean containers such as bowls and buckets.

If your home has been flooded, ensure the water taps are cleaned with hot water and detergent before using them for the first time after the flood. Before starting to use the mains water again, allow the taps to run for a few minutes, as this should clear the pipes.

Flushing the toilet

Flush toilets only for solid waste –you do not need to flush after urinating. If you have no mains water then save all water used for washing, cooking or washing up in buckets for flushing. Other sources of water, such as garden water butts, can also be used for flushing.

If the toilet is blocked then look for other facilities nearby, such as those of unaffected family, friends, neighbours, public toilets, portaloos, rest centres, local shops, supermarkets and hotels.

Formula feed for babies without mains water supply

Ideally use boiled bowser or bottled water, left covered to cool for no more than half an hour. Alternatively, use ready-made formula milk.

If there is no power for boiling and you do not have ready-made formula, bottled water can be used without boiling, but the prepared feed should then be used immediately. Do not use unboiled bowser water to make formula milk.

Bottled water from your water company will be safe to use for baby feed. If you buy your own bottled water, be aware that some natural mineral water may have a high sodium content. Look at the label for sodium or 'Na' and check its level is not higher than 200mg per litre. If it is, then try to use another water. If no other water is available then use this water for as short a time as possible. It is important to keep babies hydrated.

Water from a private supply

If a private supply from a well or spring has been covered by floodwater it may be affected. If the water changes colour, taste or smell, or you are concerned, then ring your local council for advice. In the meantime, assume the water is unsafe to drink unless it is boiled, or source an alternative supply. Continue to boil the water until the supply has been tested and shown to be safe.

Bathing children without mains water

If the water company has advised that the mains supply is unsafe for drinking then it is safer not to use this for bathing infants. In this situation, boiled bowser water or bottled water are alternatives. Baby wipes can also be used for hand cleansing and washing infants.

Cleaning contact lenses

Tap water or bowser water should never be used for cleaning or storing contact lenses as this could cause a rare but serious eye infection.

For more information visit the following websites:

Health Protection Agency –www.hpa.org.uk

Food Standards Agency –www.foodstandards.gov.uk

Drinking Water Inspectorate –www.dwi.gov.uk

KRS Environmental Ltd
Mob: [redacted]
Tel: 01686 668957
Tel: 01484 437420
Email: [redacted]
Web: www.krsenvironmental.com

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